United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
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Federal Subsistence Activity Report
Kodiak National Wildlife Refuge, February – August 2022

Salmon Fisheries

Refuge-proposed Change in Fishery Regulations

At its winter meeting, the Council was briefed on the Refuge's proposal, which pertains entirely to the Kodiak Area. In March, we submitted our proposal to the Federal Subsistence Board. At this fall meeting, the Council will consider the Office of Subsistence Management's analysis of the formal proposal, public comments on the proposal and, in response, make recommendations to the Federal Subsistence Board. The following are the two main proposal points. First, we proposed to discontinue exclusion of U.S. Coast Guard personnel that reside on the Guard's Kodiak base from participation in the federal subsistence fishery. If adopted, all Kodiak-based active-duty Guard personnel, including those who live on or off the Guard's Kodiak base who declared rural Kodiak Area residency for a year or more would be eligible to harvest finfish and shellfish (king crab) under federal subsistence regulations. Second, we proposed several changes to the narrative text in both customary and traditional use determinations (Area and Determination sections) and harvest limits (Area and Season sections) for finfish and shellfish. If adopted, these changes would improve clarity of, and compliance with, regulations among subsistence users of the specific geographic areas of applicable Kodiak Area fishery regulations.

Akalura Creek Salmon Escapement Monitoring

The Refuge initiated this survey in 2015 in response to concern about trend of diminished escapement and availability of sockeye salmon for human and brown bear subsistence. Data collected between 2015-2020 indicate a trend of decline, as referenced in our previous winter report to the Council. In 2022, monitoring started on June 6 and is scheduled to conclude by September 30. This project includes a combination of automated time-lapse photography and video to document fish passing over panels mounted on the stream substrate. In the office, salmon are enumerated from time-lapse digital images and associated video is used to calibrate time-lapse counts. The data from 2021 is currently being analyzed. We are currently reviewing 2022 data; results will be reported at the Council's next meeting.

Monitoring Water Temperature of Salmon Habitat

In 2022, we continued servicing 8 stream and 4 lake monitoring sites in the refuge. Additionally, we assisted staff of Natives of Larsen Bay and the Alutiiq Tribe of Old Harbor with its monitoring. At the range of refuge and partner monitoring sites, the objective has been to collect hourly data on a year-round basis consistent with statewide protocol. Data have been variously

analyzed including a University of Alaska study currently underway to assess the vulnerability to climate warming of SW Alaska streams including the Kodiak area.

Please note that results of salmon counts presented below were provided by the Alaska Department of Fish and Game (ADF&G).

Western Area

The early run sockeye salmon escapement for the Ayakulik River was 175,336 fish, which was the middle of the escapement goal range (140,000 to 280,000 fish). The early run sockeye salmon escapement was very strong with 251,690 sockeye salmon passing the weir. This was the third consecutive year that the early run showed strong returns of sockeye salmon. The early run sockeye salmon for Upper Station was 82,824 fish, which was in the upper portion of its escapement goal range (43,000 to 93,000). This was the second consecutive year that the early run was strong for the Upper Station system. The Frazer Lake sockeye salmon escapement was strong with 118,509 fish being recorded entering the lake.

The late run sockeye salmon escapement for the Ayakulik River was 100,772 fish, which is within the escapement goal range (60,000 to 120,000 fish). The Karluk River weir is still operational and, as of 25 August 2022, a total of 89,264 fish were counted passing through the weir. The escapement of late-run sockeye salmon is currently lower than the lower escapement goal range, and it is unknown whether it will be attained. The Upper Station late run sockeye salmon escapement is 76,461 fish, which is also below the lower escapement goal. The weir is still operational, and it is unknown whether it will reach the lower escapement goal of 120,000 fish.

The Chinook salmon escapement on both the Karluk and Ayakulik River systems failed to meet their respective lower escapement goals. The Karluk River Chinook salmon escapement was 2,268 fish, with 2022 marking the ninth consecutive year of non-attainment of the lower goal. The Ayakulik River Chinook Salmon escapement was 2,845, with 2022 marking the fourth consecutive year of non-attainment of the lower escapement goal.

Northern Area

The Litnik (Afognak) River weir was pulled on August 13, 2022, with a total sockeye escapement count of 29,509 fish, a number consistent with the escapement goal of 20,000 to 50,000 fish. The run of Buskin River sockeye salmon started slow, but by the end of the season, the 8,107 fish counted through the weir exceeded the upper escapement goal range (5,000 – 8,000 fish). Due to the low initial returns of Buskin sockeye salmon, the Refuge and the ADF&G on June 11 issued an Emergency Special Action and Emergency Order, respectively, to prohibit harvest of sockeye salmon. Subsequently, agency fishery managers re-opened the Buskin River drainage to harvest on July 2 in response to increased salmon returns and projected attainment of the escapement goal.

Brown Bear

Population Assessment

This year we surveyed the Southwest and Karluk Lake survey areas during our Intensive Aerial Survey in May. In collaboration with the ADF&G, we conducted four replicate surveys of the Southwest area and three counts of the Karluk Lake area. We estimated a density of 154 (75-234 90% CI) independent animals/1000 km^2 in the Southwest area, which was not statistically

different from the last estimate in 2017 (193 [133-252] independent animals/1000 km^2), or from the lowest limit of the management target (175 independent animals/1000 km^2; 219 [175-263] independent animals/1000 km2). In the Karluk Lake area, we estimated a density of 198 (88-308 90% CI) independent animals/1000 km^2, which was not statistically different from the last estimate in 2013 (253 [229-278] independent animals/1000 km^2) or from the lowest limit of the management target (175 independent animals/1000 km^2; 219 [175-263] independent animals/1000 km^2). Confidence limits around our estimates were wide this year, however (Figure 1). Survey conditions this year resulted in a very narrow survey window, as early spring warm weather advanced leaf-out substantially early (by May 24) and, in response, the survey had to be stopped earlier than planned. We recommend that these areas be re-surveyed, when possible, to reduce variation and increase certainty around our estimates.

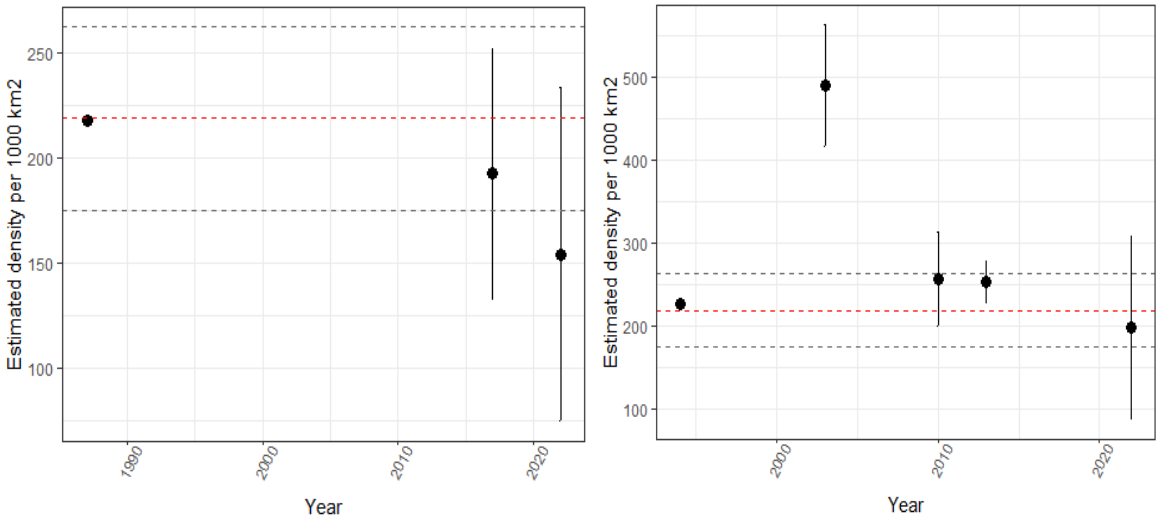

Figure 1. Southwest (left) and Karluk Lake (right) Intensive Aerial Survey results 1987-2022. Points represent estimated density of independent bears/1000km2, vertical lines represent 90% confidence limits around the estimates, and management targets are shown as red dashed lines, with their upper and lower 90% confidence limits represented by grey dashed lines. We are assuming that management action is required when the estimate and it's 90% confidence limits are lower than the lower 90% confidence limit of the management target.

For six weeks in July and August, we flew stream surveys for bears over nine traditionally surveyed stream regions in the Southwest portion of the island (Figure 2). We are still entering these data, but noted high numbers of bears on Dog Salmon Creek, Red Lake River, and Connecticut Creek during periods of our survey. A report on these data will be forthcoming.

Bear-Berry Monitoring

In addition to elderberry and devilsclub, we monitored fruit abundance of salmonberry and blueberry—important bear and human food sources—between July 7 and August 15. Plots were sampled at study sites on-refuge (Red Lake, Karluk Lake) and off-refuge (Road System). We observed low abundance of salmonberry fruit at mid mountain elevations, where most monitoring plots are located. Apparently, low fruit abundance in 2022 was associated with insect defoliation of leaves during June 2021 in the Red Lake and Karluk Lake areas. In the Road System Area,

exceptionally cold temperatures during November 2021 killed most above-ground live stems, apparently, while none of the new 2022 stems bore fruit. In contrast, we noted average abundance of the blueberry associated mostly with spruce forest in NE Kodiak Island and Afognak Island. Data collected in 2022 will be processed over the next few months and results will be reported at the Council's meeting winter 2023.

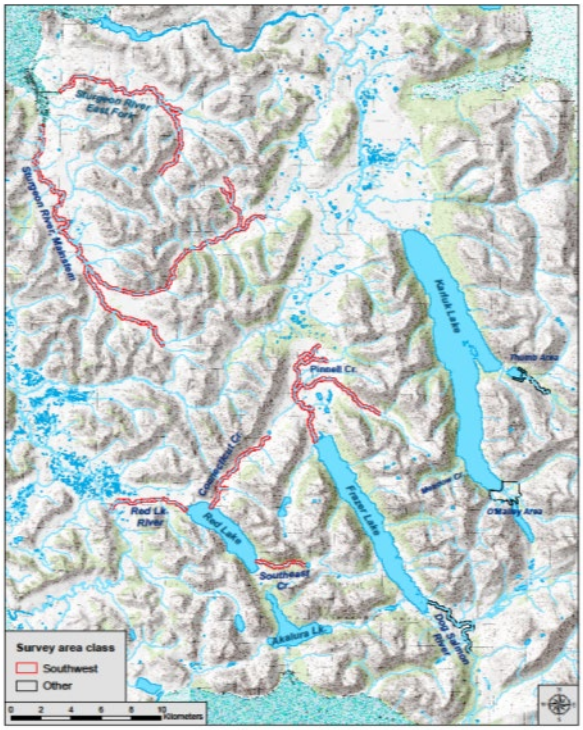

Figure 2. Bear Stream Survey areas (highlighted) in SW Kodiak Island.

Mountain Goat

Every year, we collaborate with ADF&G on collection of population growth and composition data for the goat herd on Kodiak Island. In 2022, consistent with previous years, we surveyed goats in RG480 (SW Kodiak Island) during July and August (Figure 3). We counted 1,509 total goats composed of 1,225 adults, 280 kids, and 3 unknown individuals, The kid to adult ratio computes to 23 kids per 100 adults, which is considerably lower than the ratio range observed between 2017-2020 (26-29 kids per 100 adults).

Northern Sea Otter

At its winter meeting the Council requested a summary of Refuge's recent boat-based sea otter surveys. Although marine birds are our primary survey focus, we also systematically record sea otter observations. In March we provided the Council with Robin Corcoran's summary of survey results spanning the 2011-2021 period.

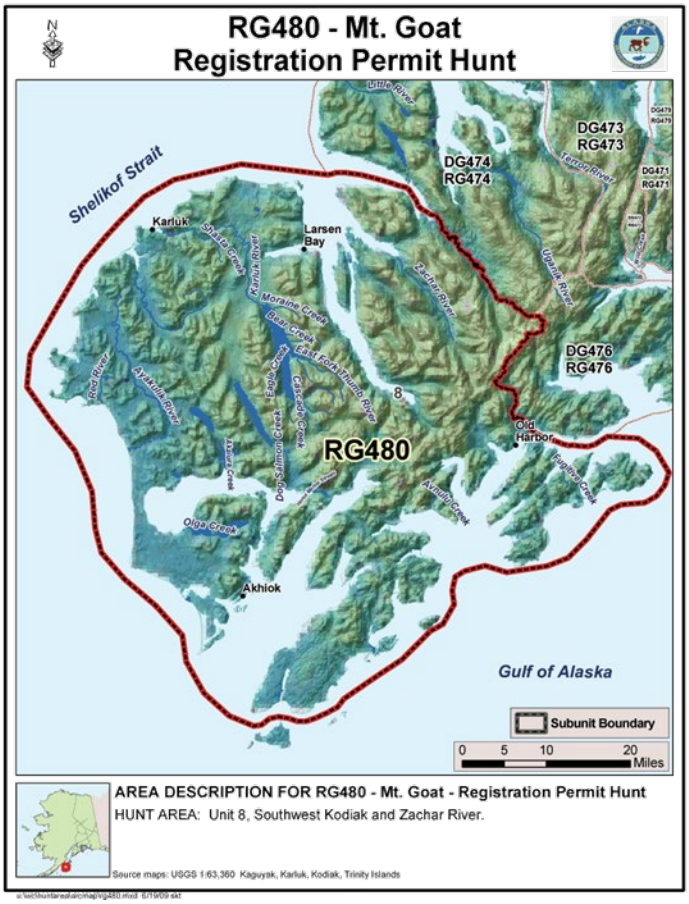

Figure 3. Location of RG480 registration hunt unit (and survey area), from ADFG.

Migratory Birds

Nearshore Marine Bird Survey

In summer 2022 the Refuge continued a survey initiated in 2011 focusing on marine nearshore birds that use both the intertidal zone and shallow inshore waters. Surveys were conducted in June and August when the majority of resident breeding birds had established nests and populations were relatively stable. August surveys allowed us to estimate productivity of species with distinctive juvenile plumages including marbled murrelets and pigeon guillemots. Surveys were conducted from small skiffs using the refuge research boat, the Ursa Major II, as a mobile home base. In summer 2022, refuge staff surveyed the west side of Kodiak Island from Viekoda Bay southwest to Middle Cape completing 51 transects in June and 44 transects in August along approximately 1000 km of shoreline. The most commonly encountered species included black-legged kittiwakes, glaucous-winged and mew gulls, tufted and horned puffins, marbled murrelets, pigeon guillemots, and harlequin ducks. Table 1 presents the preliminary count data in June and August for select species. In addition to the transect-based survey, we also surveyed nine seabird colonies in June and four in August. Previously only marine waters adjacent to refuge lands were surveyed limiting our ability to detect increasing, decreasing or stable populations over the larger region.

Table 1. Preliminary counts for select marine bird and mammal species surveyed in June and August 2022 by Kodiak Refuge on the western side of Kodiak Island from Viekoda Bay southwest to Middle Cape.

Species	June 2022 Count Data	August 2022 Count Data
Harlequin Duck	1205	485
Barrow's Goldeneye	112	62
Black Oystercatcher	122	139
Pelagic Cormorant	59	25
Red-faced Cormorant	5	0
Glaucous-winged Gull	2348	1483
Black-legged Kittiwake	8442	5257
Mew Gull	49	750
Pigeon Guillemot	469	381
Kittlitz's Murrelet	0	0
Marbled Murrelet	346	285
Tufted Puffin	2306	568
Horned Puffin	83	50
Harbor Seal	840	95
Sea Otter	1023	689
Steller Sea Lion	8	1

Cooperative Puffin Project

We are currently undertaking a comprehensive analysis of transect survey data collected in the Kodiak Archipelago to generate a population estimate for Tufted and Horned Puffins breeding in the region, as well as a comparative assessment of abundance trends derived from boat-based colony censuses and transect surveys conducted 1975-2022. This research will be part of a multi-year graduate student dissertation, "Inferring mechanisms of population regulation through comparative studies of Tufted and Horned Puffins breeding in the Kodiak Archipelago" conducted by Katelyn Stoner under the guidance of Dr. Donald Lyons in the Department of Fisheries and Wildlife at Oregon State University. Population and trend assessments will be supported with assessments and comparisons of *Fratercula* puffin gillnet bycatch risk, non-breeding distributions, breeding and non-breeding stable isotopic diets, and offspring saxitoxin exposure. Cooperators include USFWS Kodiak NWR, USFWS Ecological Services, USFWS Pacific Seabird Program, and USGS Alaska Science Center.

Education, Outreach, and Other Noteworthy Activity

Migratory Bird Calendar Contest

"Fill Your Bill: The Neat Beaks of Alaska's Migratory Birds" was the theme this year. Lesson plans, art supplies and other resources were sent to all teachers and students in the Kodiak Rural School District, including homeschool students. In addition to supplies, a live online presentation was made available to interested teachers. This year, 36 entries were submitted from our region including entries from the communities of Ouzinkie, Port Lions, Akhiok, Old Harbor and Larsen Bay. The judging was done by a volunteer panel of judges including Susan Malutin, Coral Chernoff, David Tucker, Peter Olsen and Robin Corcoran, the Refuge's Avian Biologist. We appreciate all the judges and teachers that contributed their time and energy for the calendar contest!

The state judging took place this spring and we are excited to announce that two students from the Kodiak archipelago region will be featured in the 2023 calendar: Tina Covarrubias from Port Lions for her Art entry and Isabel Szert from Old Harbor for her Literature entry. Look for them in the 2023 calendar!

Figure 4. Art by Tina Covarrubias showing birds and the food they eat.

Floating Kodiak Refuge Visitor Center

Staff aboard the Refuge's research vessel Ursa Major II appreciated the warm welcome we received when we visited the communities of Ouzinkie and Port Lions in early May. The back deck was transformed into a visitor center with a number of educational activities as well as a photo booth. In both communities, all students from the school came to the harbor to tour the boat with their teachers. Refuge staff used the opportunity to share about Refuge biological monitoring and research efforts while also presenting certificates and awards for the FWS Alaska Migratory Bird Calendar Contest. We hope to visit other communities next year to continue this tradition that was put on hold the last couple of years due to COVID considerations.

Rural School District Education Kits

In lieu of in person visits during the 2021-2022 school year, we offered to send lesson kits to all interested teachers and homeschool students in the Kodiak Rural School District. We were excited when all teachers expressed interest. Each month we sent lessons and supplies for ~100 students. We were honored to partner with the Alutiiq Museum for an Alutiiq themed kit and with the Kodiak Area Native Association for a marine themed kit.

Figure 5. Students in Ouzinkie enjoy the exhibits and activities onboard the Ursa Major II. (S. Lawson/USFWS)

Alaska Native Science and Engineering Program (ANSEP)

We employed Ashlynn Christensen between June and mid-August. She ably assisted puffin cooperative research while acquiring experience working in the Fish and Wildlife Service.

Figure 6. Researcher Katelyn Stoner (left) guides Ashlynn Christensen's (right) processing of a captured Horned Puffin. Measurements were taken and a tracking device (geolocater) was affixed to the puffin's leg (R. Corcoran/USFWS).

Dig Afognak

Koniag/FWS Community Affairs Liaison Amy Peterson and Refuge Education Specialist Shelly Lawson participated in the Koniag Shareholder Dig Afognak session. Shelly and Amy assisted with a variety of stations led by other instructors and also led Refuge nature journaling activities for all ages. It was fulfilling to connect with youth and adult community members on the deep and rewarding level that is provided at Dig Afognak. We are grateful to have been involved.

Salmon Camp

Natural Cycles of the Earth was our theme for camp this year and we opted to have Salmon Camp 100% outdoors. Our full-time camp staff consisted of seasonal ranger Gretchen Mominee, and volunteer intern Laurie Enders. Three Kodiak Refuge Youth Leaders, high school students Megan Cornett, Scout DeVries and Emmy Counceller, contributed over 70 hours each - volunteering their time assisting as mentors at camp. Koniag/FWS Community Affairs Liaison Amy Peterson also assisted at in town and village trip camps, infusing Alutiiq language into learning as well as her infectious enthusiasm. We led four sessions of camp on the road system for grades 2nd-8th which included lessons on salmon life cycle, fishing, tidepooling, water sampling, learning about refuge research, art, songs, games and more. Our staff traveled to the communities of Ouzinkie, Port Lions and Old Harbor to bring Salmon Camp to the students. A planned trip to Akhiok was cancelled twice due to Covid safety precautions. We hope to make it out to Akhiok for a school visit this fall.

Figure 7. Amy Peterson assists campers at an art station during a Salmon Camp fishing day at Fort Abercrombie State Historical Park. (S. Lawson/USFWS)

Youth Conservation Corps (YCC)

Our summer teen hires, Reagan Deemer and Darlene Luzano participated in a number of projects with refuge staff and partners. We appreciate the Sun'aq Tribe of Kodiak staff for taking time to meet with the teens to teach them about invasive crayfish and guide them in removing crayfish from Buskin Lake. The YCC crew also assisted Salmon Camp on fishing days, with lessons on the carbon cycle, and also partnered with staff of the ADF&G at Frazer Lake to learn about salmon work on the weir.

Figure 8. Darlene Luzano, YCC team, learning how to collect salmon for sampling at Frazer Fish Pass. (S. Lawson/USFWS)

Invasive Plant Management

Focused management efforts geared to protect native plants and habitats, and to restore them where necessary, continued in spring and summer 2022. Partnered survey and control actions were conducted by permission at recurrently managed private lands such as the Buskin River watershed (US Coast Guard), Akalura Cannery (Akhiok-Kaguyak, Inc.), Alitak Cannery (Ocean Beauty LLC), and the Camp Island area, Karluk Lake (Koniag, Inc.). Additionally, the Refuge, in partnership with the Kodiak Soil and Water Conservation District, conducted an early July outreach and survey mission along the west coast of Kodiak Island. Field crew met and discussed threats of invasive plants with permanent and seasonal residents including 20 individuals of seven parties, as well as surveyed for invasive plants at 13 sites. A total five sites were weed free, while another eight sites collectively harbored one or more of 15 invasive species.

Update on Refuge Personnel Vacancies

Law Enforcement Officer James Reynolds arrived in Kodiak on May 30 coming to us from the NW Dakota Refuge Complex, which included Lake Zahl, Lostwood, Des Lacs, Upper Souris and J. Clark Salyer National Wildlife Refuges. While in North Dakota, James conducted big game, upland game, waterfowl, fishing and refuge regulations law enforcement. James is retired from the United States Coast Guard (USCG) after serving for 22 years. While in the USCG,

James conducted fisheries, counter narcotic, migrant interdiction and recreational boating safety law enforcement. This is James's second time being stationed on Kodiak. The first time being in 1992 after graduating USCG Boot Camp.