State of Alaska
Department of Fish and Game
Nomination for Waters
Important to Anadromous Fish

Region: ARCTIC ~~WESTERN~~

USGS Quad: Kotzebue B-5 & B-6

Anadromous Water Catalog Number of Waterway: 331-00-10805-0020

Name of Waterway: Devil Mountain Lakes (North)

☒ USGS Name ☐ Local Nam

☒ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #	97 072	[signature] Regional Supervisor	11-30-96 Date
Revision Year:			
Revision to:	Atlas ____ Catalog ____ Both ____	[signature] AWC Project Biologist	2/12/97 Date
Revision Code:	A-2	[signature] Drafted	12/3/97 Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Pink Salmon	8 August 1996	X		X Adult	☒
					☐
					☐
					☐
					☐

IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments:
Caught during a lake survey, see attached trip report. We caught only a few pink salmon. All were adults in prespawning condition. It is not known where they spawn.

ALASKA DEPT. OF FISH & GAME
DEC 3 1996
REGION II HABITAT AND RESTORATION DIVISION

Name of Observer (please print): Alfred L. DeCicco

Date: 11/27/96

Signature: [signature]

Address: ADF&G Sportfish
1300 College Rd, Fairbanks

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: [signature]

Revision 11/96

TRIP REPORT

FISH SURVEYS OF ESPENBERG MAAR LAKES, 7-9 August, 1996. Fred DeCicco, Jeff York

This survey was paid for by a cooperative agreement with the NBS to collect fish from western Alaska and the Russian Far East for contaminate analysis.

The Espenberg Maars, the largest maar lakes in the world, are located on the northern tip of the Seward Peninsula about 40 km southwest of Cape Espenberg. The lakes are deep (40 to 100 m) and oligotrophic but are located on the coastal plain where most water bodies are shallow thaw lakes (Beget, Hopkins and Charron 1996). Prior to this survey, it was unknown if these lakes contained fish. However, since the lakes ranged in age from approximately 17,500 to 100,000 years, were deep enough to overwinter fish, and were not thought to have been glaciated during the last glacial event, it was suspected that they did contain fish. In fact, the older lakes could have served as refuges for fish during the Wisconsin Glaciation (Dr. David Hopkins, personal communication). Dr. David Hopkins requested that I collect snail or clam shells and moss from each lake that we visited so he could age the lakes again and determine calcium origin.

After a delayed departure from Fairbanks, I arrived in Kotzebue at about 12:30 p.m. where I was met by Jeff York (NBS field technician from Anchorage) who was to function as my field assistant for this project. After organizing our gear and purchasing groceries, we departed Kotzebue with Northwestern Aviation's Cessna 206 on floats at about 2:30 p.m. and landed in North Devil Mountain Lake at about 3:15 p.m. The wind was calm. North and South Devil Mountain Lakes are divided on the surface by a narrow spit of sand. We camped on the East edge of the spit on the shore of NDML. We circled the lake before landing and it was noted that the outlet stream on the northwest side of NDML was blocked by a beach berm, and there was no surface flow from the lake, however, there was water downstream a short distance suggesting that some water was filtering through the gravel. The beach near our camp made a hollow sound when something heavy, such as a cooler or the raft, was dropped on it. This was a bit unsettling, suggesting a cavity somewhere underneath. The beach was almost entirely of lava. Water in both lakes appeared absolutely clear without color.

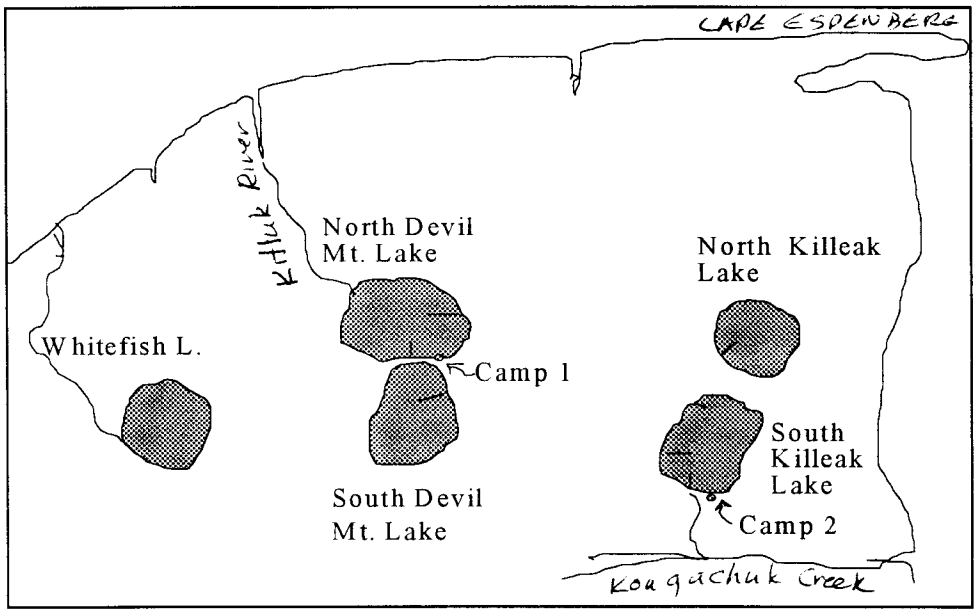

Figure 1. The Espengerg Marr Lakes.

We set three 125' variable mesh gill nets in NDML. Two were in tandem, and one was set alone off the spit (figure 1). Two 125' nets in tandem so they would reach into deep water were set in SDML. In addition, three minnow traps baited with salmon eggs were set in each lake. No snail or clam shells were observed in NDML, and no fish were observed swimming or feeding in either lake. Very fragile snail shells were found in the surf line along the spit bordering the north shore of SDML, and one caddis larvae was found there. As we rowed the raft around the east side of NDML, we noticed some green algae on the rocks near a small inlet stream. Since none was noticed elsewhere around the lake, it was assumed that this was a result of carbon being transported to the lake by this small tundra drainage.

The wind was blowing on August 8, and the waves were eroding the sand spit separating the two lakes, surface water was flowing from NDML to SDML through a shallow breach in the spit. We checked the two nets in tandem on the east side of NDML catching 5 pink salmon males, 1 least cisco and 12 Arctic char which appeared similar to *S. taranetzi* I observed in some Russian lakes in 1992. Neither the minnow traps nor the other floating gill net had caught any fish. In SDML the gill nets captured 1 female pink salmon and 19 Arctic char. The presence of adult pink salmon indicates that the drainage from NDML must have been recently open to allow passage into the lake. Passage between NDML and SDML is intermittent from wave action. Surface water temperature at about 2 p.m. was 9.5 degrees C. in SDML, and 9.75 degrees C. in NDML. We collected moss from SDML, and the float plane arrived at about 4 p.m.

I departed with the raft, gillnets and minnow traps in order to set nets in Whitefish Lake. We flew around the lake observing that the wave action had made the lake turbid, suggesting that it was shallow in comparison the Devil Mountain Lakes. There was also considerable emergent vegetation along the margins of the lake, and a number of waterfowl, in contrast to the DML's where no waterfowl were seen. We landed in the northeast quarter of Whitefish Lake and immediately found that the floats were stuck in mud and we were still about 100 m from shore. We were able to taxi out to deeper water, and since time was limited, we left Whitefish Lake for North Killeak Lake where I was dropped off while the plane returned to NDML to pick up Jeff and the camp. The water in North Killeak Lake appeared turbid and green with a dark center suggesting deeper water. I was dropped off in the southwest side of the lake where I set two gill nets in tandem to reach deep water, and three minnow traps. Upon straightening the lead line of the net, I had already caught four least cisco. The shoreline was littered with snail shells, the water was green with phytoplankton, and there were numerous waterfowl around the margin of the lake. The plane then returned and moved me to South Killeak Lake where we set up camp near the dry outlet stream. We set one net from the southwest shore of the lake, and two in tandem near the outlet stream on the south end of the lake.

On August 9, we left to check our nets in South Killeak Lake. During the night the wind began to blow from the north. Wave action had initiated flow in the outlet stream which had been dry the night before. Now there was a flowing channel about 3 m wide and .2 m average depth. The tandem set near the outlet contained four Arctic char, and the set from the southwest shore contained three Arctic char and one male pink salmon. There were two small Arctic char in one minnow trap, and the waves had stranded another 20 small Arctic char along the beach. Since these were in excellent shape, some still barely alive, we picked them up. Jeff and I walked down the outlet stream and observed several small fish which we could not catch. I set two baited minnow traps in the pool where we had observed the small fish, but was unable to catch any. It is not known what species they were, but they may have been young Arctic char that had been swept into the outlet stream by wave action. Arctic char could leave the lake intermittently via wind driven flows in the outlet stream, but if anadromy originated through this means, there would be no guarantee that fish could return to the lake to overwinter, and they would likely be lost to the system.

The airplane returned, and we packed up our gear and flew over to North Killeak Lake where we checked our gear. Of the three minnow traps, one contained a single nine-spine stickleback. The gillnets contained only least cisco, about 250 of them which ranged up to about 800 g. Similar situations have been noted in Scandinavian Lakes where those with Coregonids seldom contain Arctic char. Least cisco

are plankton feeders, and likely outcompeted the Arctic char which may have resided in this lake at an earlier time.

We then returned to Kotzebue and sorted our samples.

Notes on the Arctic char. The fish appeared to be similar among the three lakes which contained them. Their occurrence in these lakes represents a newly discovered range extension for Arctic char in Alaska. The nearest known Arctic char are in cirque lakes in the Kigluaik Mountains, about 160 km to the south. The fish in the Kigluaik Mountains could have only had access to the lakes within the last 9,000 years, because they were frozen prior to that time. However, the maar lakes have never been glaciated. Fish presence has been limited only by the age of the lakes. The oldest, Whitefish Lake, although it was not sampled, probably does not contain char, North Killeak Lake is the next oldest, somewhat older than South Killeak Lake at 40,000 years. The Devil Mountain Lakes are estimated to be the youngest at approximately 17,500 years, approximately the time when the Wisconsin glaciation was at its maximum.

Literature Cited:

Bege't, J.E., D. M. Hopkins, and S. D. Charron, 1996. The largest known maars on earth, Seward Peninsula, northwest Alaska. Arctic, vol 49, No. 1 (March 1996), P. 62-69.

KOTZEBUE (B-6) QUADRANGLE
ALASKA
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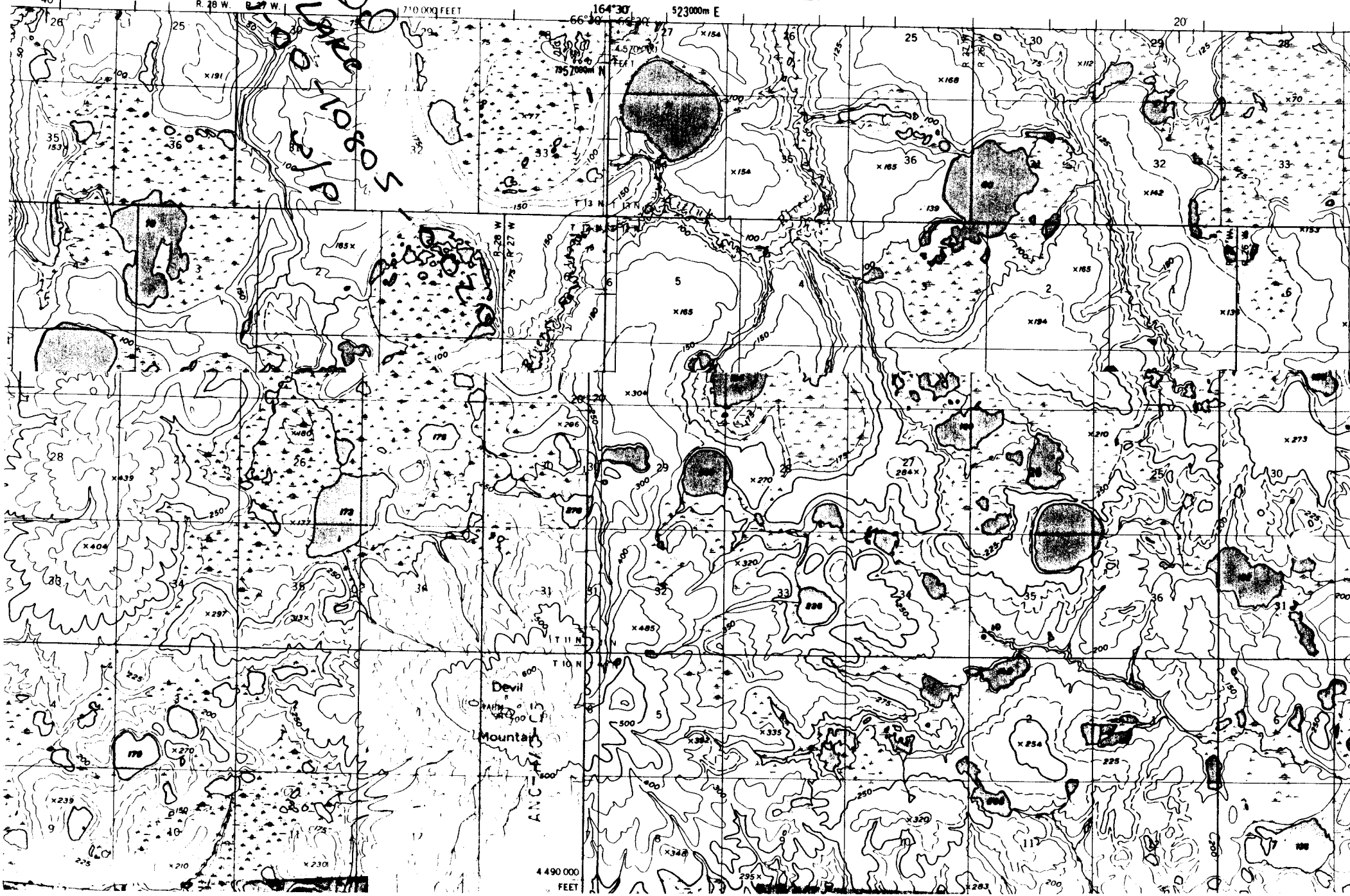
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