Freshwater Fish Inventory of Aniakchak National Monument and Preserve, Southwest Alaska Inventory and Monitoring Network

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ABSTRACT

A freshwater fish inventory was conducted within Aniakchak National Monument and Preserve between 17-21 August 2002, and 29 May -20 July 2003. The purpose of the inventory was to document *expected yet undocumented species* and to collect baseline abundance, distribution, and other biological information. Using minnow seines, beach seines, gill nets, hoop traps, minnow traps, a fyke net, and sport-fishing gear we sampled Surprise Lake, Aniakchak River, Meshik Lake, Meshik River, and two coastal streams flowing into the Pacific Ocean. Three of eight expected yet undocumented species were captured, Alaska blackfish (*Dallia pectoralis*), coastrange sculpin (*Cottus aleuticus*), and ninespine stickleback (*Pungitius pungitius*). The fish communities within Aniakchak National Monument and Preserve appear to be typical of watersheds in southwest Alaska and the Alaska Peninsula.

EXECUTIVE SUMMARY

The National Park Service (Inventory and Monitoring Program) has undertaken a nationwide inventory of natural resources. As part of this effort, a freshwater fish inventory was conducted within Aniakchak National Monument and Preserve (ANIA) during the summer of 2002 and 2003. Aniakchak National Monument and Preserve is part of the Inventory and Monitoring program's Southwest Alaska Network (SWAN), which also comprises Alagnak Wild River (ALAG), Katmai National Park and Preserve (KATM), Kenai Fjords National Park (KEFJ), and Lake Clark National Park and Preserve (LACL).

The primary objective of the inventory was to document, through capture or observation, fishes that were *expected yet undocumented* within ANIA. A secondary objective was to provide initial descriptions of the distributions, abundance, and biologic characteristics of these species. The list of expected but undocumented species was based on fish communities of adjacent watersheds and included eight species (listed alphabetically by common name followed parenthetically by scientific name): Alaska blackfish (*Dallia pectoralis*), arctic grayling (*Thymallus arcticus),* arctic lamprey (*Lampetra camtschatica*), coastrange sculpin (*Cottus aleuticus*), longnose sucker (*Catostomus catostomus*), ninespine stickleback (*Pungitius pungitius*), Pacific lamprey (*Lampetra tridentate*), and round whitefish (*Prosopium cylindraceum*) (AKNHP 2000).

The ANIA fish inventory focused on Surprise Lake, Aniakchak River, Albert Johnson Creek, Meshik Lake, Meshik River, Creek 100 and Creek 200. A variety of sampling tools were used: minnow seine, beach seine, gill net, hoop trap, minnow trap, fyke net, and hook-and-line. Three of the eight expected yet undocumented species were captured: Alaska blackfish, coastrange sculpin, and ninespine stickleback. However, all three of these were known to occur in the Meshik River drainage prior to the inventory (Wagner and Lanigan 1988).

The three new species documented during the inventory are consistent with known distribution patterns in southwest Alaska and the Alaska Peninsula. No range extensions or unexpected species were identified within ANIA. Five expected species were not detected: arctic grayling, arctic lamprey, longnose sucker, Pacific lamprey, and round whitefish.

INTRODUCTION

The Inventory and Monitoring Program of the National Park Service is conducting nationwide natural resource inventories. As part of this effort, a freshwater fish inventory was conducted within Aniakchak National Monument and Preserve (ANIA) during the summer of 2002 and 2003. Aniakchak National Monument and Preserve is part of the Inventory and Monitoring program's Southwest Alaska Network (SWAN), which comprises ANIA, Alagnak Wild River (ALAG), Katmai National Park and Preserve (KATM), Kenai Fjords National Park (KEFJ), and Lake Clark National Park and Preserve (LACL).

The watersheds within ANIA provide freshwater habitat for both anadromous and resident fishes. Many of the anadromous fishes have significant economic value (mainly salmon) and have been previously documented, whereas the majority of resident freshwater fishes are neither economically important nor documented. These undocumented species include a broad range of fishes with highly diverse life histories and variable habitat requirements (e.g., blackfish, sculpins, and sticklebacks).

The lack of information surrounding undocumented species presents a number of problems for resource managers. First, it is difficult to understand ecological interactions within an ecosystem without knowing which species are present in that ecosystem. Species composition directly affects interspecific competition levels, predator-prey relationships, habitat partitioning and, subsequently, growth rates,

population dynamics, and natural selection. Second, detecting the effects of environmental change, whether human induced or natural, is problematic without species presence data. Subtle changes in the physical or biological characteristics of freshwater habitat may result in local extinction, range extension, or variation in life-history tactics. Without baseline data to serve as a reference point, documenting or responding to these events becomes difficult.

The primary objective of the inventory was to document, through capture or observation, fishes that were *expected yet undocumented* within ANIA. A second objective was to provide initial descriptions of the distributions, abundance, and biologic characteristics of these species. The list of expected but undocumented fishes was based on fish communities of adjacent watersheds and included eight species (listed alphabetically by common name followed by scientific name parenthetically): Alaska blackfish (*Dallia pectoralis*), arctic grayling (*Thymallus arcticus),* arctic lamprey (*Lampetra camtschatica*), coastrange sculpin (*Cottus aleuticus*), longnose sucker (*Catostomus catostomus*), ninespine stickleback (*Pungitius pungitius*), Pacific lamprey (*Lampetra tridentate*), and round whitefish (*Prosopium cylindraceum*) (AKNHP 2000). It is important to note that the terms *expected* and *undocumented* are subject to multiple interpretations. In this report, these terms are used specifically in the context of species lists provided by the Revised Biological Inventory Study Plan (NPS 2001) and Alaska Natural Heritage Program (AKNHP 2000). There is evidence that some of our expected but undocumented species were previously documented within ANIA boundaries or in drainages that originate within ANIA (see Wagner and Lanigan 1988).

METHODS AND MATERIALS

Study Sites

Aniakchak National Monument and Preserve is located 640 km (398 mi) southwest of Anchorage on the Alaska Peninsula and encompasses 235,000 ha (580,685 ac; Mahoney et al. 1991). The 9.5 km (6 mi) wide Aniakchak Caldera is located near the center of the monument.

Within ANIA, we sampled Surprise Lake, Aniakchak River, Albert Johnson Creek, Meshik Lake, Meshik River, and two formerly unnamed creeks referred to here as "Creek 100" and "Creek 200." (Figure 1; Note: Creek 100 = Iris Creek and Creek 200 = Willow Creek in our sampling journals). Surprise Lake is 275 ha (680 ac), has a maximum depth of 19.5 m (64.0 ft). The Aniakchak River is 43 km (27 mi) long and runs from Surprise Lake to the Gulf of Alaska and the Pacific Ocean (Mahoney et al. 1991). Albert Johnson Creek is a tributary to the Aniakchak River and originates just south of Meshik Lake. Meshik Lake is 205 ha (506 ac), relatively shallow [< 2.0 m (6.6 ft)], and is located within the National Preserve just south of Pinnacle Mountain. The Meshik River originates in Meshik Lake and flows 70 km (43 mi) into Bristol Bay. Surprise Lake, Aniakchak River, Albert Johnson Creek, Meshik Lake and Meshik River have been sampled previously and detailed descriptions of their aquatic habitat are available (e.g., Wagner and Lanigan 1988; Mahoney and Sonnevil 1991; Hamon 2001).

Creek 100 and Creek 200 are located on Cape Ayutka and flow into Aniakchak Bay and Amber Bay, respectively, (Gulf of Alaska). Creek 100 has a bank-full channel width of about 15 m and an average depth of about 0.5 m. In the lower reaches, riffle and pool habitats are most common. Substrate material consists mainly of gravel and cobble and appears adequate for salmonid spawning. Creek 100 has dense riparian vegetation dominated by alder. Creek 200 is a continuous glide and has a highly sinuous, incised channel about 2 m wide (bank-full) and 1 m deep. Substrate materials are mainly gravel and fines. Riparian vegetation includes willow, grasses and forbes. We were unable to find records of previous habitat or fish sampling at either creek, however, cultural use has been documented (Al Anderson, Chignik Lagoon, Personal Communication February 2004).

Fish Sampling

The Inventory was conducted during the periods of 17-21 August 2002, and 29 May through 20 July 2003. Specific sampling sites within each region were chosen by examining the habitat requirements of *expected yet undocumented* species. These habitat requirements were related to physical habitat features that were observable in the field or by using topographic maps. Targeted habitat for Alaska blackfish included vegetated backwater areas, ponds, side channels, and other low flow environments. Adult arctic lamprey and Pacific lamprey were expected to be found in river habitats drifting downstream. Juvenile lampreys (ammocoetes) were expected to be found in silty or muddy substrates. Arctic grayling were expected to be found in clear river and lake habitats. Coastrange sculpins and longnose suckers were expected to be in close

association with cobble or gravel habitat in lakes and flowing waters. Round whitefish were expected to be in littoral and benthic lake habitats. Ninespine stickleback were predicted to inhabit backwater and side-channel areas within riverine habitats, as well as the benthic and littoral zones of lakes (e.g. Heard et al. 1969; McPhail and Lindsey 1970; Russell 1980).

We attempted to identify these specific habitats before the start of the field season but most of the sampling sites were selected in the field. This judgment-based approach was an attempt to maximize the probability of encounter with undocumented species given a short field season and large sampling area.

After arrival at each sampling site we recorded latitude, longitude, time, water depth, and a brief habitat assessment. Latitude and longitude were determined using a Garmin® GPS 76 (WGS 84 datum). The time was recorded at the start and conclusion of the sampling event. A portable Hummingbird® Piranha II depth sounder was used to determine water depth. Habitat appearance (e.g., description of water movement, fluvial characteristics, and general observations) was assessed in the immediate vicinity of the sampling gear.

A number of different gear types were used to document species presence in specific habitat types (habitats follow gear type parenthetically): minnow traps (benthic lake and river, littoral lake, main channel river, side-channel river, ponds), hoop traps (benthic lake and river, littoral lake), minnow seines (littoral lake, side channel river, ponds),

beach seines (littoral lake), fyke nets (main channel river, side channel river), gill nets (littoral lake, limnetic lake), and hook-and-line (all habitats). Murphy and Willis (1996) provide general descriptions, theoretical discussions, and caveats of these sampling techniques.

The rate at which fish were captured was measured in catch per unit of effort (CPUE) for each gear type used. The “unit of effort” varies among gear types (e.g., the unit of effort for a single set of a beach seine is a “set”, while a minnow trap effort is measured in “trap-hours”). The unit of effort is based upon how the gear captures fishes and whether or not time plays a role. Using flies as an example: a fly swatter and honey are both used to catch flies. Each use of the swatter is a discrete catch event whereas the honey continuously attracts and catches flies over time. The swatter effort could be measured in “swats” and honey effort measured in teaspoons (or other quantity) of honey and time e.g. “teaspoon-minutes.” Catching five flies per swat and catching five flies per teaspoon-minute are both examples of CPUEs, but the two values are not equivalent (i.e., sample values are not directly comparable when units of effort differ between gear types). Our CPUE estimates are very simple and do not consider spatial dimensions of nets, bait quality, field crew experience and other complicating factors. See Murphy and Willis (1996) for further discussion of CPUE.

Minnow traps were baited with either salmon eggs or salmon flesh and were set by boat or from shore. Traps were fished for 0.5 to 29.0 h at depths ranging from 0.2 to 20.0 m

(0.7 to 65.6 ft). In waters 2.0 m (6.6 ft) and deeper, traps were marked with a buoy and anchored with a 3.0 to 5.0 kg (6.6 to 11.0 lb) sand bag.

Hoop traps were baited with salmon eggs and were set by boat. The hoop traps were 122.9 cm (48.0 in) long and 60.9 cm (24.0 in) in diameter and constructed with four steel rings with 25.4 mm (10.0 in) mesh netting (all mesh sizes represent diagonal or stretched measurements as opposed to square or bar measurements). Hoop traps were fished for 15.0 to 29.0 h at depths ranging from 0.3 to 20.0 m (1.0 to 65.6 ft) and were marked with a buoy.

Minnow seines were set from shore and in shallow areas less than 1.0 m (3.3 ft) deep. Minnow seine dimensions were 2.0 m (6.6 ft), 4.0 m (13.1 ft), or 15.0 m (49.2 ft) long by 1.0 m (3.3 ft) deep with a homogenous mesh size of 12.7 mm (0.5 in).

The beach seine was deployed in nearshore waters (less than 4.0 m [13.1 ft] deep) where large snags were not apparent. The net was 30.5 m (100.0 ft) long and about 3.7 m (12.0 ft) deep, comprising 10 variable mesh panels (3.2, 4.8, 6.4, 12.7, and 22.2 mm [0.1, 0.2, 0.3, 0.5, and 0.9 in]).. Panels were symmetric about the midline of the net with the smallest mesh at the center.

The fyke net was fished in flowing waters less than 1.0 m (3.3 ft) deep to capture fishes moving downstream. The net design was similar to those used by the Alaska Department of Fish and Game for salmon smolt studies (e.g., Crawford and Cross

1995). The main body of the net was1.2 by 1.2 m (3.9 by 3.9 ft) tapering down to a round cod-end about 0.5 m (1.6 ft) in diameter. Two mesh panels [1.2 m (3.9 ft) deep by 3.0 m (9.8 ft) long] directed fish into the net entrance. Both the net and panels were constructed from 6.0 mm (0.2 in) mesh.

Small and large variable mesh gill nets were fished across a range of depths and at surface and subsurface locations. Gill nets were 60.0 m (196.9 ft) long, 1.8 m (5.9 ft) deep and made up of six 10.0 m (32.8 ft) panels. The larger mesh net had 10.0, 19.0, 33.0, 45.0, 55.0, and 60.0 mm (0.4, 0.7, 1.3, 1.8, 2.2, and 2.4 in) panels, whereas the smaller net had 10.0, 12.5, 16.0, 19.0, 22.0, and 25.0 mm (0.4, 0.5, 0.6, 0.7, 0.9, and 1.0 in) panels.

Hook-and-line sampling was performed with setlines and conventional sport fishing equipment. Fishing gear was deployed from boats or from shore and both artificial lures and bait (salmon flesh) were used.

Processing fish samples involved identifying, counting, measuring and then releasing or retaining individual fish. Fish were identified to species level using dichotomous keys (McPhail and Lindsey 1970; Mecklenburg et al. 2001; Pollard et al. 1997). Captured fish were counted and a sub sample was measured for length [fork length (FL) or total length (TL)]. Adult salmon and larger starry flounder were not measured because we lacked adequate gear to anesthetize and handle them without injury. Following measurement, most fish were released; however, some fish or fish parts were retained

as voucher samples. There were two types of voucher samples: tissue and whole-fish. Tissue sampling was non-lethal and consisted of taking a small fin-clip, usually from the caudal fin, and preserving it in 95.0% ethanol. Whole-fish samples were collected when the identity of the fish could not be determined in the field. Whole-fish that were retained as voucher samples were killed by exposure to a lethal dose of clove oil and then preserved in ethanol. Voucher specimens were sent to the University of Alaska Museum Fish Collection for curation and verification of species identity.

RESULTS

Three out of eight *expected yet undocumented* species were captured during the 2003 inventory: Alaska blackfish, coastrange sculpin, and ninespine stickleback. A single Alaska blackfish was found at the Meshik River; coastrange sculpin were found in the Aniakchak River, Creek 100, and Creek 200; and ninespine sticklebacks were found in Albert Johnson Creek, the Aniakchak River, Meshik Lake, and Meshik River. Surprise Lake had the lowest relative species diversity with no newly documented species captured and only two species present (Dolly Varden and sockeye salmon [*Oncorhynchus nerka*]). The Aniakchak River had the highest relative species diversity with two newly documented species and seven previously documented species captured (Table 1). The results below summarize relative abundance, length frequencies, and catch CPUE for all documented species within each major sampling region (raw data are reported in Appendix A).

Surprise Lake

Dolly Varden and sockeye salmon were the only two species captured in Surprise Lake (Table 1).

Dolly Varden—Nine hundred and forty two Dolly Varden were captured at Surprise Lake (Table 1) ranging from 15 to 199 mm in length (mean FL= 114.2 mm, SD= 27.37 mm, n= 513). Multiple age groups were present based on the range of lengths observed and established age size relationships (See Mahoney and Sonnevil 1991; Figure 4).

Dolly Varden were captured in minnow traps, minnow seines, hoop traps, and beach seines (Table 4). They were relatively abundant at depths of 20.0 m (65.6 ft) and rare in nearshore shallow habitats (e.g., less than 5.0 m [16.4 ft]).

Sockeye Salmon—Twelve hundred and fifty four juvenile sockeye salmon were captured at Surprise Lake ranging from 26 to 96 mm in length (mean FL= 70.9 mm, SD= 15.02, n= 329). The length frequency plot indicated three age classes were present including young of the year and smolts (Figure 4). Most sockeye salmon were captured with beach seines and minnow traps (Table 4) in nearshore littoral regions of Surprise Lake. Sockeye were rare at depths greater than 5.0 m (16.4 ft).

Aniakchak River

Two previously undocumented species were captured in the Aniakchak River: coastrange sculpin and ninespine stickleback. Seven previously documented species were also captured: coho salmon, Dolly Varden, Pacific staghorn sculpin, pink salmon, sockeye salmon, starry flounder, and threespine stickleback (Table 1).

Coastrange Sculpin—Three coastrange sculpins were captured in the Aniakchak River ranging from 93 to 94 mm (mean TL= 93.5 mm, n= 2). They were captured in minnow traps and seines in the lower, tidally influenced portion of the river (Table 5).

Ninespine Stickleback—Four ninespine sticklebacks were captured in the Aniakchak River ranging from 43 to 53 mm (mean FL= 46.7 mm, SD= 4.79, n= 4). They were captured in minnow traps in small, vegetated side channels of the lower river (Table 5).

Coho Salmon—Eight hundred and eighty coho salmon were captured in the Aniakchak River (Table 1). Of the juveniles measured, lengths ranged from 35 to 197 mm (mean FL= 82.3 mm, SD= 30.26, n= 89). Several large returning adults (600 mm+) were also captured but not measured. Among the juveniles, at least two age classes were present (Figure 5). Coho salmon were ubiquitous in lotic and lentic habitats of the middle and lower Aniakchak River. They were represented in fyke net, minnow trap, sport fishing gear, and minnow seine catches (Table 5).

Dolly Varden—Fifty two Dolly Varden were captured in the Aniakchak River (Table ranging from 70 to 264 mm (mean FL= 163.4 mm, SD= 73.88, n= 51). Multiple age classes were captured based on the wide range of the FL distribution (Figure 5). Dolly Varden were captured with minnow seines, minnow traps, and sport-fishing gear (Table 5) in lotic and tidally influenced habitat.

Pacific Staghorn Sculpin—One hundred Pacific staghorn sculpin were captured in the Aniakchak River ranging in length from 26 to 177 mm (mean FL= 58.2 mm, SD= 25.08, n= 95). Multiple age classes were likely present based on the multimodal length distribution (Figure 5).

Pacific staghorn sculpins were captured with minnow seines, minnow traps and sport-fishing gear (Table 5) in the tidally influenced reaches of the lower Aniakchak River.

Pink Salmon—One pink salmon spawner was observed floating downstream near the mouth of the Aniakchak River. No data were collected from this individual.

Sockeye Salmon—Seventeen juvenile sockeye salmon were captured in the Aniakchak River (Table 1) ranging in FL from 38 to 87 mm (mean FL= 69.0 mm, SD= 29.96, n= 3). Sockeye salmon were captured in minnow seines, minnow traps, and a fyke net (Table 5) in habitat with moderate flow and gravel substrate.

Starry Flounder—Eighty one starry flounder were captured in the Aniakchak River (Table 1) ranging from 24 to 184 mm in length (mean TL = 74.2 mm, SD = 31.75, n = 77). Several juvenile age classes were represented in the length frequency distribution (Figure 5). Large adult starry flounder (300 mm+) were also captured but lengths were not recorded. Starry flounder were caught in minnow seines (Table 5) in the tidally influenced portion of the lower Aniakchak River.

Threespine Stickleback—Thirteen threespine sticklebacks were captured ranging from 42 to 81 mm (mean FL= 73.0 mm, SD= 15.26, n= 6). Threespine sticklebacks were captured with minnow traps (Table 5) in a small, vegetated side channel of the lower river.

Albert Johnson Creek

The ninespine stickleback was the only undocumented species captured in Albert Johnson Creek. Previously documented Coho salmon, Dolly Varden, and threespine sticklebacks were also found (Table 1).

Ninespine Stickleback—Fifty six ninespine sticklebacks were captured in Albert Johnson Creek ranging from 40 to 62 mm (mean TL= 49.0 mm, SD= 6.83, n= 21). It is probable that there were at least two age classes present based on the bimodal distribution of length frequencies (Figure 6).Some of the fish exhibited coloration associated with spawning: dark black/brown dorsal surface and white ventral surface.

Ninespine sticklebacks were captured infrequently in minnow traps and minnow seines (Table 6). They were found in lower velocity habitats such as ponds, side channels, and backwater areas.

Coho Salmon—Seven hundred juvenile coho salmon were captured in Albert Johnson Creek ranging from 45 to 96 mm (mean FL= 69.2 mm, SD= 12.92, n= 61). Two age classes were present based on the range and bimodal distribution of length frequencies (Figure 6). Coho were observed in most lotic habitats and frequently captured in minnow seines and minnow traps (Table 6).

Dolly Varden—Sixty three Dolly Varden were captured in Albert Johnson Creek (FL = 89 mm, n=1) using minnow seines and minnow traps. The CPUEs for both sampling methods were relatively low (Table 6). Dolly Varden were captured in lotic and lentic habitats including side channels, backwater pools, ponds, and ephemeral streams.

Threespine Stickleback—One threespine stickleback was captured in Albert Johnson Creek (TL = 74 mm). The single fish was captured in shallow water of the mainstem creek using a minnow trap.

Creek 100

The coastrange sculpin was the only previously undocumented species captured at Creek 100while five other documented species were also captured: coho salmon, Dolly Varden, rainbow trout, starry flounder and threespine stickleback (Table 1).

Coastrange Sculpin—Nine coastrange sculpins were captured in Creek 100(Table 1). Lengths were estimated to be greater than 50 mm but less than 100 mm. All sculpins were captured using minnow traps (Table 7) in riffle or pool habitat where cobble or gravel substrate present.

Coho Salmon—One hundred and forty eight juvenile coho salmon were captured in Creek 100(Table 1) using minnow seines, minnow traps, and sport-fishing gear (Table 7). Coho were encountered in most of the lotic habitat sampled.

Dolly Varden—Five hundred and seventy two Dolly Varden were captured in Creek 100(Table 1). The largest individuals exceeded 400 mm in length and were probably anadromous based on their silvery coloration and large girth (qualitative observations–Dolly Varden were not measured). Dolly Varden were captured in minnow traps, minnow seines, and with sport fishing gear (Table 7) in pools and riffles. Larger adults were found in deep pools near the mouth of the creek.

Rainbow Trout—Thirty nine juvenile rainbow trout were captured in Creek 100(Table 1) using minnow traps and sport-fishing gear (Table 7). All were found in lotic habitat.

Starry Flounder—A single dead starry flounder was observed in the lower, tidally influenced section of Creek 100.

Threespine Stickleback—One threespine stickleback was captured in Creek 100(Table 1). The fish was captured in a Minnow trap (Table 7) in a tidally influenced, low velocity reach of the lower creek.

Creek 200

Coastrange sculpin was the only previously undocumented species captured at Creek 200. Two documented species were also captured: Dolly Varden and threespine stickleback (Table 1).

Coastrange Sculpin—One coastrange sculpin was captured in a deeply incised channel of Creek 200 (Table 1), using a minnow trap (Table 8)

Dolly Varden—Two juvenile Dolly Varden (less than 200 mm) were captured in a deeply incised channel of Creek 200 (Table 1), using a minnow trap (Table 8)

Threespine Stickleback— Four adult threespine sticklebacks were captured in Creek 200 (Table 1). All were captured with minnow traps in a deep channel with gravel substrate.

Meshik Lake

The ninespine stickleback was the only previously undocumented species captured at Meshik Lake. Four other species were also captured: coho salmon, Dolly Varden, sockeye salmon, and the threespine stickleback (Table 1).

Ninespine Stickleback—Three ninespine sticklebacks were captured in Meshik Lake (Table 1) ranging from 41 to 50 mm in length (mean TL= 47.0 mm, SD= 5.20, n= 3). Ninespine sticklebacks were captured with minnow seines (Table 9) near shore.

Coho Salmon—One hundred and eighty nine coho salmon were captured in Meshik Lake (Table 1) ranging from 41 to 81 mm in length (mean FL= 49.2 mm, SD= 4.65, n= 112). The range in lengths represents two juvenile age classes. Coho salmon were captured in minnow seines and minnow traps (Table 9) in the nearshore regions of Meshik Lake.

Dolly Varden—Three adult Dolly Varden were captured in Meshik Lake (Table 1) ranging from 333 to 450 mm in length (mean FL= 378.0 mm, SD= 63.00, n= 3). All were captured in the central portion of the lake using a gill net (Table 9).

Sockeye Salmon—Six hundred and seventy nine juvenile sockeye salmon were captured in Meshik Lake (Table 1) ranging from 34 to 79 mm in length (mean FL= 58.0 mm, SD= 9.58, n= 243) The length frequency distribution indicates the presence of young-of-the-year and smolt life history stages (Figure 7). Sockeye salmon were

captured with minnow traps and minnow seines (Table 9) in nearshore regions of the lake.

Threespine Stickleback—Seven hundred and fifty six threespine sticklebacks were captured in Meshik Lake (Table 1) ranging from 30 to 61 mm in length (mean TL= 42.9 mm, SD= 6.14, n= 165). Threespine sticklebacks were captured in minnow seines, minnow traps, and hoop traps (Table 9). Threespine sticklebacks were found in most regions of the lake and were closely associated with aquatic vegetation.

Meshik River

Two previously undocumented species were captured in the Meshik River: Alaska blackfish and ninespine stickleback. Both species have been previously documented in the Meshik River drainage (see Wagner and Lanigan 1988). There were also four other species captured; coho salmon, Dolly Varden, sockeye salmon, and threespine stickleback (Table 1).

Alaska Blackfish—One Alaska blackfish (TL = 58 mm) was captured in a backwater slough of the Meshik River using a minnow trap (Table 9). The slough was stagnant with brown filamentous algae present.

Ninespine Stickleback—Two ninespine sticklebacks were captured in the Meshik River (Table 1) (mean TL = 55.0 mm, SD= 1.41, n= 2) using minnow traps (Table 10).

The fish were captured in a low flow area near an eroded bank where the substrate comprised sand and silt.

Coho Salmon—Four hundred and eight juvenile coho salmon were captured in the Meshik River (Table 1) ranging from 46 to 116 mm in length (mean FL= 83.35 mm, SD= 18.28 mm, n= 20). At least two age groups were present within the length distribution of our samples (Figure 8). Coho salmon were captured in minnow traps and minnow seines (Table 10) in a range of lotic and lentic habitats: interfaces between the mainstem channel and lower flow environments, pools, and backwater areas.

Dolly Varden—Sixty seven Dolly Varden were captured in the Meshik River (Table 1) ranging from 63 to 152 mm in length (mean FL= 100.3 mm, SD= 25.25, n= 50). Multiple age groups were present within the length distribution of our samples (Figure 8). Dolly Varden were captured with minnow seines and minnow traps (Table 10) in lotic habitats adjacent to undercut banks or other cover.

Sockeye Salmon—Sixteen juvenile sockeye salmon were captured in the Meshik River (Table 1) using minnow seines and in minnow traps (Table 10). Sockeye salmon were found in lotic habitats near the river bank.

Threespine Stickleback—Fifteen threespine sticklebacks were captured in low-flow habitats of the Meshik River (Table 1) using minnow traps.

DISCUSSION

All of the species documented in the 2003 ANIA inventory are consistent with known fish distributions in southwest Alaska (Heard et al. 1969; McPhail and Lindsey 1970; Russell 1980; Wagner and Lanigan 1988; Mecklenburg et al. 2002). Consequently, no range extensions or unexpected species were identified within ANIA.

Five of the eight expected yet undocumented species were not detected: arctic grayling, arctic lamprey, longnose sucker, pacific lamprey and round whitefish. Our sampling was not thorough enough to prove species absence so the documentation of these fish remains unresolved. However, it is possible that some of these fish are not present in ANIA, particularly non-anadromous arctic grayling, longnose sucker, and round whitefish. Previous studies of the Meshik River, Aniakchak River and adjacent Chignik River systems have not detected any of these three undocumented species (Roos 1959; McPhail and Lindsey 1970; Wagner and Lanigan 1988; Mahoney and Sonnevil 1991; Mecklenburg et al. 2002).

The fish species observed in the Aniakchak National Monument and Preserve freshwater fish inventory represent a partial picture of a southwestern Alaskan ecosystem. More work is needed to determine whether undocumented species are present, as well as the abundance, distributions and biological characteristics of documented species that were observed. With potential changes in climate and human use on the horizon, collecting baseline data, such as those contained in this inventory,

is especially important to understanding and managing the factors that influence fish and their habitat.

PLANS FOR THE COMING YEAR

In 2004 we will conduct a freshwater fish inventory of Kenai Fjords National Park. Again, we will be focusing on documenting putative expected yet undocumented species including coastrange sculpin, longnose sucker, Pacific lamprey, and round whitefish. The inventory will focus on Delight Lake, Desire Lake, the Nuka River, and other recently formed glacial lakes, and coastal streams.

RECOMMENDATIONS

Aniakchak National Monument and Preserve is a remote place characterized by unpredictable weather. All sampling and travel activities require consideration of these factors. Extra time should be built into sampling schedules to account for delays (e.g. at least two extra days for drop-off and pick up dates).

ACKNOWLEDGEMENTS

The authors would like to thank the staff of Katmai National Park and AKSO support office for administrative and logistical assistance. In particular Jeremiah Nelson, Sarah Graber, Daniel McDonell, Imes Vaughn, Troy Hamon, Elaine Wang, Laurel Bennett, Dorothy Mortenson, Bill Leacock, Alan Bennett, and Alan Gilliland. This project was funded by the National Park Service Inventory and Monitoring Program.

Species	Aniakchak Drainage			Cape Ayutka		Meshik Drainage		Totals
	Albert Johnson Cr.	Aniakchak River	Surprise Lake	Iris Creek	Willow Creek	Meshik Lake	Meshik River	
Expected yet undocumented species								
Alaska Blackfish *(Dallia pectoralis)*	0	0	0	0	0	0	1	1
Coastrange Sculpin *(Cottus aleuticus)*	0	3	0	9	1	0	0	13
Ninespine Stickleback *(Pungitius pungitius)*	56	4	0	0	0	3	2	65
Previously documented species								
Coho Salmon, Silver *(Oncorhynchus kisutch)*	700	880	0	148	0	189	408	2325
Dolly Varden *(Salvelinus malma)*	63	52	942	572	2	3	67	1701
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	100	0	0	0	0	0	100
Pink Salmon *(Oncorhynchus gorbuscha)*	0	1	0	0	0	0	0	1
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0	0	39	0	0	0	39
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0	17	1264	0	0	679	16	1976
Starry Flounder *(Platichthys stellatus)*	0	81	0	1	0	0	0	82
Threespine Stickleback *(Gasterosteus aculeatus)*	1	13	0	1	4	756	15	790

Table 1. Numbers and species of fish captured or observed in each drainage of ANIA sampled during the 2003 freshwater fish inventory.

	Aniakchak Drainage			Cape Ayutka		Meshik Drainage		
Gear Type (effort unit)	Albert Johnson Cr.	Aniakchak River	Surprise Lake	Iris Creek	Willow Creek	Meshik Lake	Meshik River	Totals
Angling (hook-hours)	-	10.0	-	5.0	-	-	-	15.0
Beach Seine (sets)	-	-	13.0	-	-	-	-	13.0
Fyke Net (hours)	-	5.6	-	-	-	-	-	5.6
Gill Net (hours)	-	-	-	-	-	2.3	-	2.3
Hoop Trap (trap-hours)	-	-	96.1	-	-	30.5	-	126.6
Minnow Seine (sets)	14.0	20.0	3.0	4.0	-	18.0	12.0	71.0
Minnow Trap (trap-hours)	720.6	400.3	843.5	88.3	6.5	471.3	760.7	3,291.1

Table 2. Sampling effort for different gear types used within each drainage. Units of effort vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort).

Species	Angling (fish/hook-hour)	Beach Seine (fish/set)	Fyke Net (fish/hour)	Gill Net (fish/hour)	Hoop Trap fish/trap-hou	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species							
Alaska Blackfish *(Dallia pectoralis)*	0.00	0.00	0.00	0.00	0.00	0.00	<0.01
Coastrange Sculpin *(Cottus aleuticus)*	0.00	0.00	0.00	0.00	0.00	0.01	<0.01
Ninespine Stickleback *(Pungitius pungitius)*	0.00	0.00	0.00	0.00	0.00	0.08	0.02
Previously documented species							
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0.13	0.00	0.72	0.00	0.00	10.04	0.49
Dolly Varden *(Salvelinus malma)*	1.40	1.15	0.00	1.29	0.23	0.77	0.48
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0.13	0.00	0.00	0.00	0.00	1.35	<0.01
Pink Salmon *(Oncorhynchus gorbuscha)*	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0.27	0.00	0.00	0.00	0.00	0.00	0.01
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0.00	91.31	0.90	0.00	0.00	9.79	0.03
Starry Flounder *(Platichthys stellatus)*	0.00	0.00	0.00	0.00	0.00	1.14	0.00
Threespine Stickleback *(Gasterosteus aculeatus)*	0.00	0.00	0.00	0.00	0.01	2.97	0.18

Table 3. Catch per unit effort (CPUE) for all species captured within ANIA during the freshwater fish inventory. Previously documented species that were not captured are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort).

Species	Beach Seine (fish/set)	Hoop Trap (fish/trap-hour)	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species				
Alaska Blackfish *(Dallia pectoralis)*	0	0	0	0
Coastrange Sculpin *(Cottus aleuticus)*	0	0	0	0
Ninespine Stickleback *(Pungitius pungitius)*	0	0	0	0
Previously documented species				
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0	0	0	0
Dolly Varden *(Salvelinus malma)*	1.15	0.30	9.33	1.03
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	0	0	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0	0	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	91.31	0	0	0.09
Starry Flounder *(Platichthys stellatus)*	0	0	0	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	0	0	0

Table 4. Catch per unit effort (CPUE) for different gear types used at Surprise Lake during the ANIA freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Surprise Lake. Previously documented species that were not captured during the inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Angling (fish/hook-hour)	Fyke Net (fish/hour)	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species				
Alaska Blackfish *(Dallia pectoralis)*	0	0	0	0
Coastrange Sculpin *(Cottus aleuticus)*	0	0	0.05	<0.01
Ninespine Stickleback *(Pungitius pungitius)*	0	0	0	0.01
Previously documented species				
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0.10	0.72	5.55	1.91
Dolly Varden *(Salvelinus malma)*	1.20	0	0.90	0.05
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0.20	0	4.80	<0.01
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0	0	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0	0.90	0.55	<0.01
Starry Flounder *(Platichthys stellatus)*	0	0	4.05	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	0	0	0.03

Table 5. Catch per unit effort (CPUE) for different gear types used at the Aniakchak River during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Aniakchak River. Previously documented species that were not captured during the inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species		
Alaska Blackfish *(Dallia pectoralis)*	0	0
Coastrange Sculpin *(Cottus aleuticus)*	0	0
Ninespine Stickleback *(Pungitius pungitius)*	0.21	0.07
Previously documented species		
Coho Salmon, Silver *(Oncorhynchus kisutch)*	26.71	0.45
Dolly Varden *(Salvelinus malma)*	0.07	0.09
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0	0
Starry Flounder *(Platichthys stellatus)*	0	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	<0.01

Table 6. Catch per unit effort (CPUE) for different gear types used at Albert Johnson Creek during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Albert Johnson Creek. Previously documented species that were not captured during the inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Angling fish/hook-hour	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species			
Alaska Blackfish *(Dallia pectoralis)*	0	0	0
Coastrange Sculpin *(Cottus aleuticus)*	0	0	0.10
Ninespine Stickleback *(Pungitius pungitius)*	0	0	0
Previously documented species			
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0.20	4.75	1.45
Dolly Varden *(Salvelinus malma)*	1.50	0.75	6.34
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	0	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0.80	0	0.40
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0	0	0
Starry Flounder *(Platichthys stellatus)*	0	0	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	0	0.01

Table 7. Catch per unit effort (CPUE) for different gear types used Creek 100 during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Creek 100. Previously documented species that were not captured during the inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Minnow Trap (fish/trap-hour)
Expected yet undocumented species	
Alaska Blackfish *(Dallia pectoralis)*	0
Coastrange Sculpin *(Cottus aleuticus)*	0.16
Ninespine Stickleback *(Pungitius pungitius)*	0
Previously documented species	
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0
Dolly Varden *(Salvelinus malma)*	0.31
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0
Starry Flounder *(Platichthys stellatus)*	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0.62

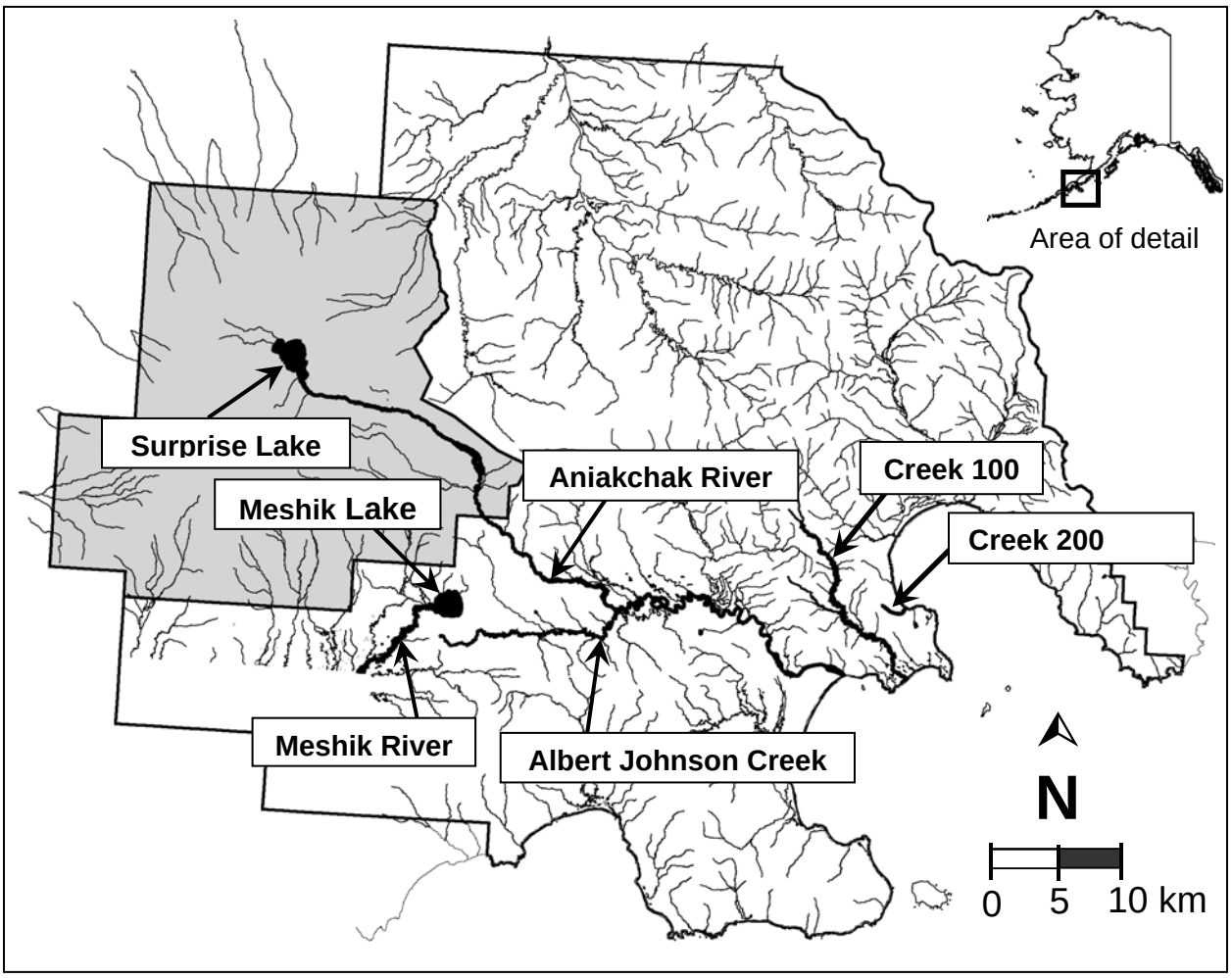
Table 8. Catch per unit effort (CPUE) for different gear types used at Creek 200 during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Creek 200. Previously documented species that were not captured during the inventory are not listed. Trap-hour reflect the number of traps deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Gill Net (fish/hour)	Hoop Trap (fish/trap-hour)	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species				
Alaska Blackfish *(Dallia pectoralis)*	0	0	0	0
Coastrange Sculpin *(Cottus aleuticus)*	0	0	0	0
Ninespine Stickleback *(Pungitius pungitius)*	0	0	0.17	0
Previously documented species				
Coho Salmon, Silver *(Oncorhynchus kisutch)*	0	0	9.22	0.05
Dolly Varden *(Salvelinus malma)*	1.30	0	0	0
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	0	0	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0	0	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0	0	37.67	<0.01
Starry Flounder *(Platichthys stellatus)*	0	0	0	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	0.03	11.72	1.15

Table 9. Catch per unit effort (CPUE) for different gear types used at Meshik Lake during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Meshik Lake. Previously documented species that were not captured during the inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.

Species	Minnow Seine (fish/set)	Minnow Trap (fish/trap-hour)
Expected yet undocumented species		
Alaska Blackfish *(Dallia pectoralis)*	0	<0.01
Coastrange Sculpin *(Cottus aleuticus)*	0	0
Ninespine Stickleback *(Pungitius pungitius)*	0	<0.01
Previously documented species		
Coho Salmon, Silver *(Oncorhynchus kisutch)*	3.58	0.48
Dolly Varden *(Salvelinus malma)*	0.42	0.08
Pacific Staghorn Sculpin *(Leptocottus armatus)*	0	0
Pink Salmon *(Oncorhynchus gorbuscha)*	0	0
Rainbow Trout, Steelhead *(Oncorhynchus mykiss)*	0	0
Sockeye Salmon, Red *(Oncorhynchus nerka)*	0.50	0.01
Starry Flounder *(Platichthys stellatus)*	0	0
Threespine Stickleback *(Gasterosteus aculeatus)*	0	0.02

Table 10. Catch per unit effort (CPUE) for different gear types used at Meshik River during the freshwater fish inventory. For comparative purposes, the expected yet undocumented species and previously documented species lists include all fishes captured during the ANIA inventory, not just Meshik River. Previously documented species that were not captured during the 2003 inventory are not listed. Units of measurement vary among gear types. A set is a single deployment and retrieval of a net. Trap-hour and hook-hour reflect the number of traps or hooks deployed multiplied by the number of hours the gear was fished (e.g., three traps fished for three hours = nine trap-hours of effort). CPUE's were not recorded for gear types that did not catch fish.


Area of detail
Surprise Lake
Meshik Lake
Aniakchak River
Creek 100
Creek 200
Meshik River
Albert Johnson Creek
N
0 5 10 km

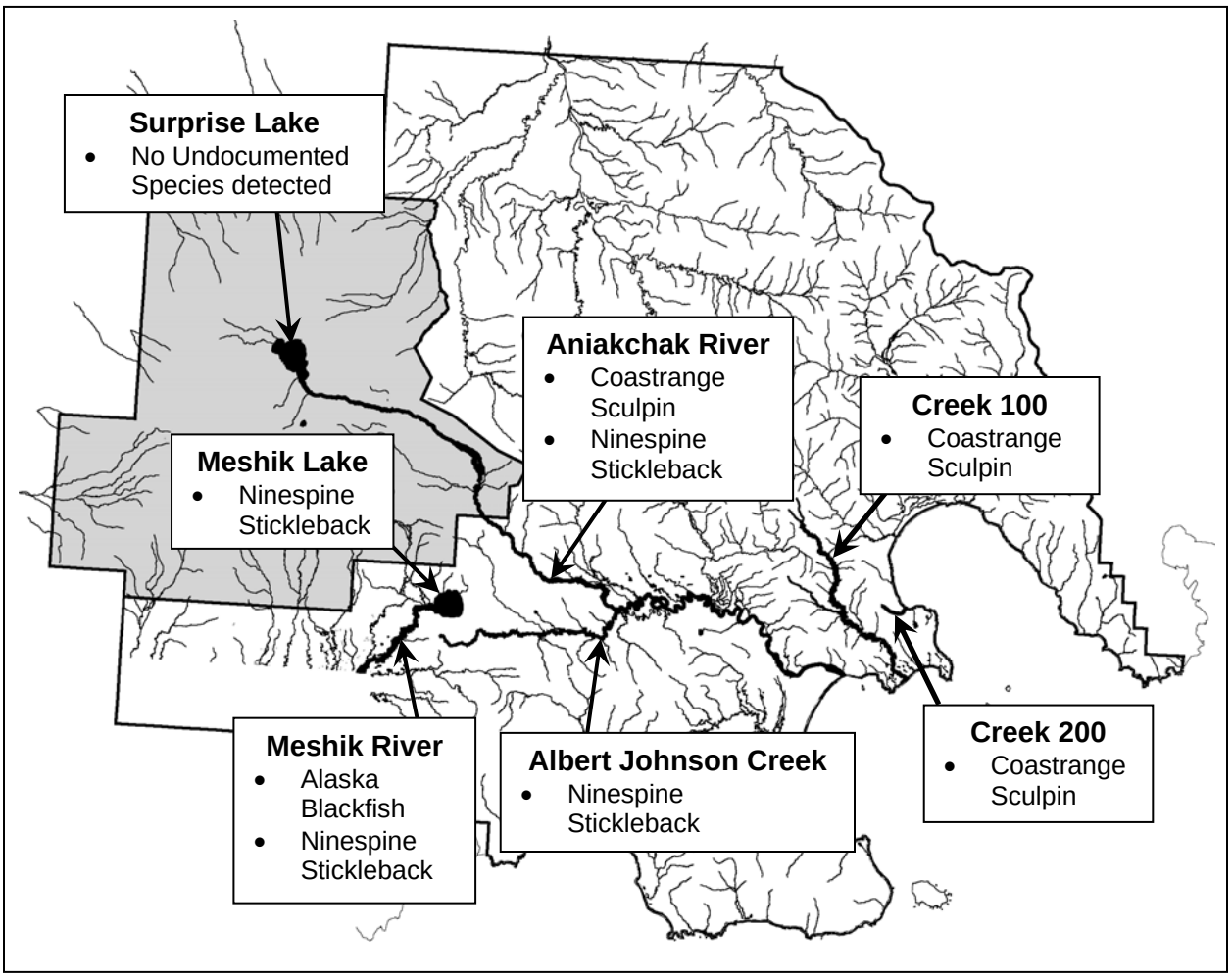


Figure 2. Location of lakes and rivers where expected yet undocumented species were observed in the freshwater fish inventory of Aniakchak National Monument and Preserve. Aniakchak National Monument is shaded in gray and the Preserve is contained within the black outline.

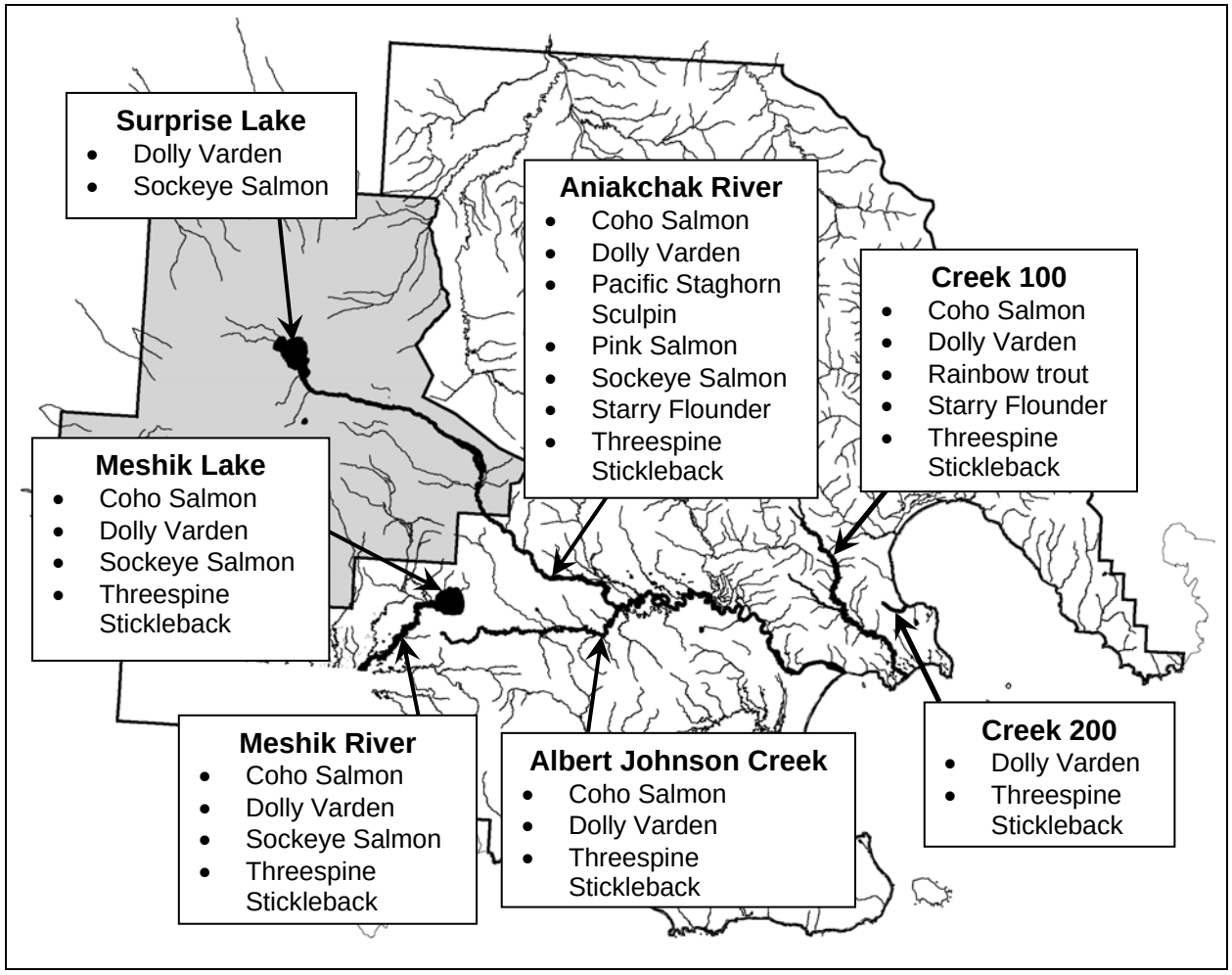


Figure 3. Location of lakes and rivers where previously documented species were observed in the freshwater fish inventory of Aniakchak National Monument and Preserve. Aniakchak National Monument is shaded in gray and the Preserve is contained within the black outline.

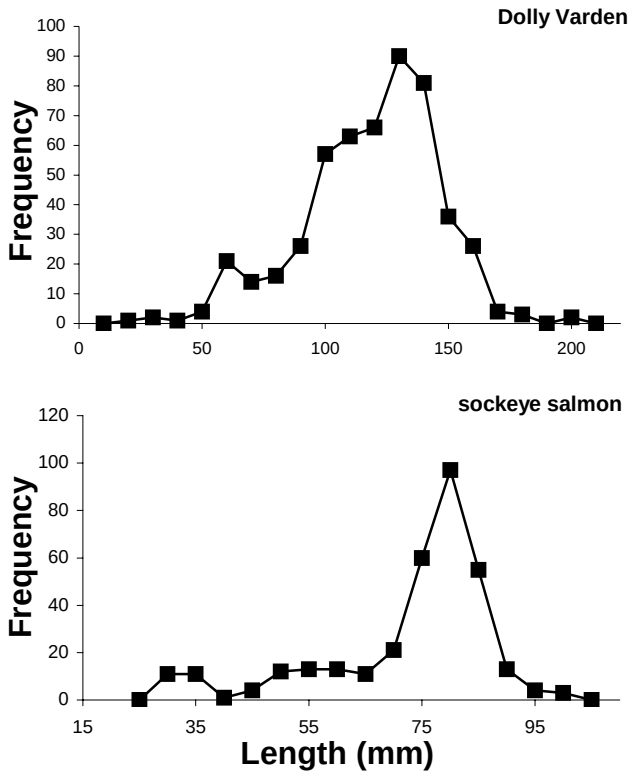


Figure 4. Length frequencies for species captured at Surprise Lake. Species with fewer than ten observations were omitted. Fork length was measured for salmonids and total length was measured for all other species.

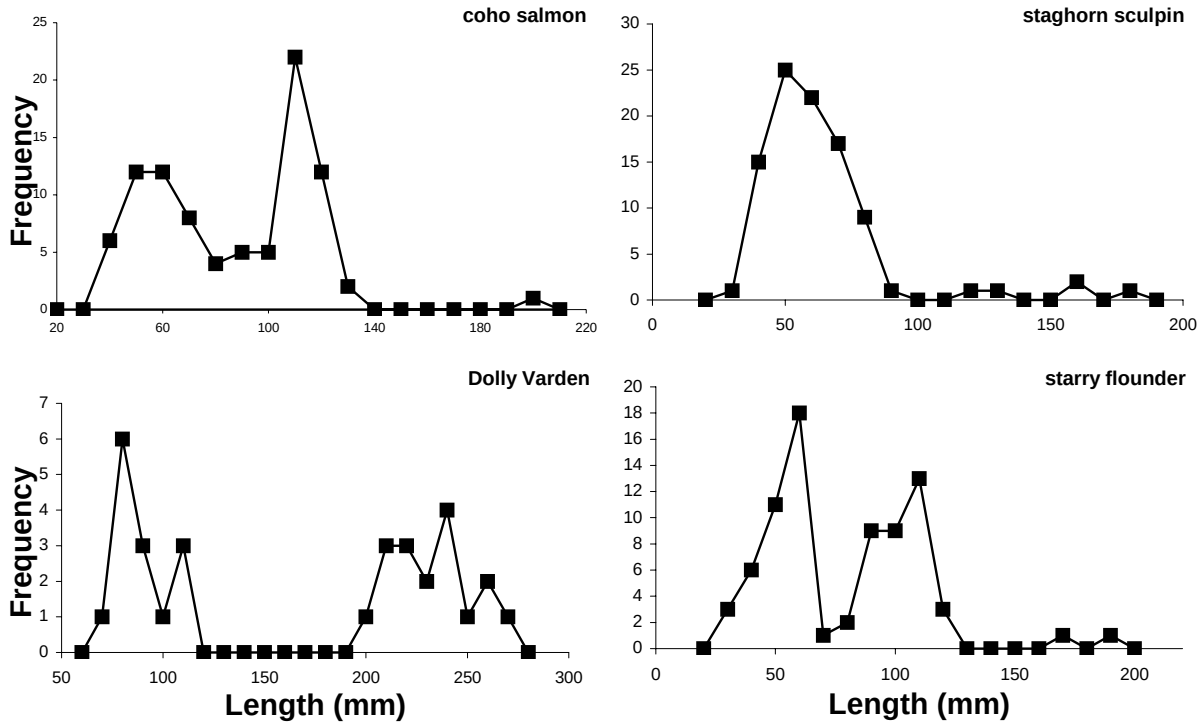


Figure 5. Length frequencies for species captured in The Aniakchak River. Species with fewer than ten observations were omitted. Fork length was measured for salmonids and total length was measured for all other species.

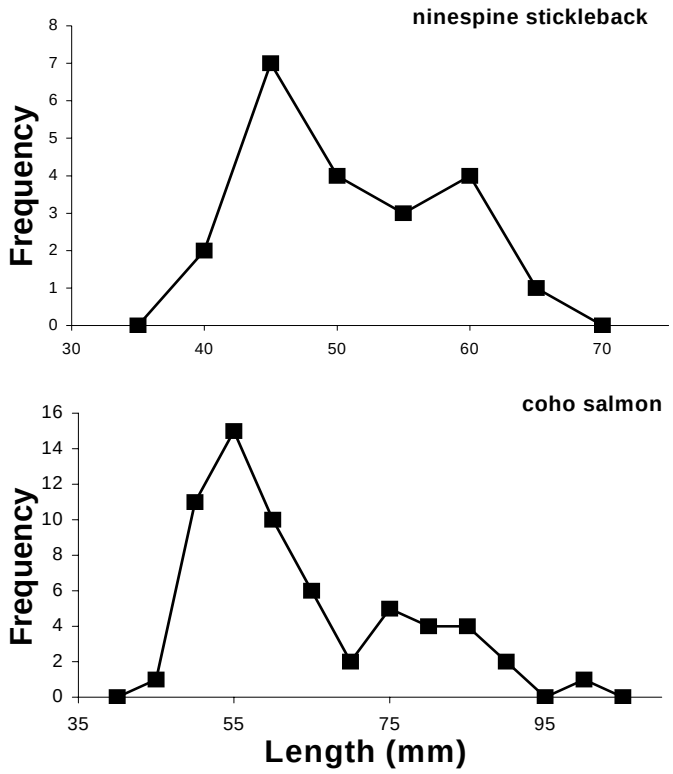


Figure 6. Length frequencies for species captured at Albert Johnson Creek. Species with fewer than ten observations were omitted. Fork length was measured for salmonids and total length was measured for all other species.

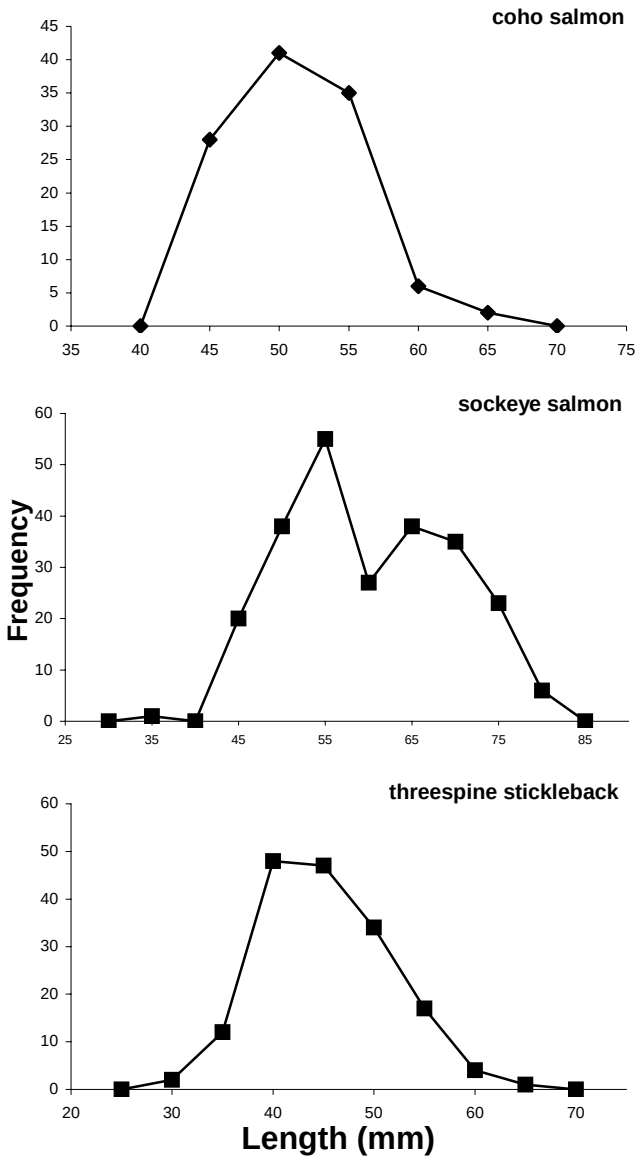


Figure 7. Length frequencies for species captured at Meshik Lake. Species with fewer than ten observations were omitted. Fork length was measured for salmonids and total length was measured for all other species.

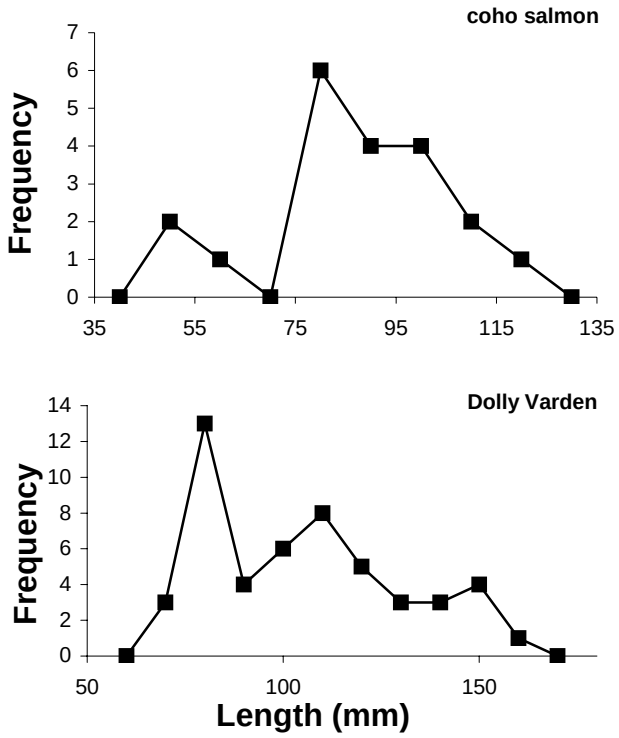


Figure 8. Length frequencies for species captured in The Meshik River. Species with fewer than ten observations were omitted. Fork length was measured for salmonids and total length was measured for all other species.

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APPENDIX A

This appendix contains raw observation data collected during the ANIA freshwater fish inventory.

Defintions:

Site ID: An alpha-numeric code which designates a unique sampling location. The first four letters identify a watershed or region (e.g., **ABJC**=**A**l**B**ert **J**ohnson **C**reek –there was no consistent pattern to letter selection). The next three numbers reflect the order in which each site was sampled. Gaps in these numbers are normal: we would typically begin each day with a new number series (e.g., day 1 = **001-099**, day 2= **100-199**, day 3= **200-299**… etc.). When the letters and numbers are combined, a unique location identifier is created (e.g., **ABJC001**). Most importantly, each **Site-ID** corresponds with a unique Latitude and Longitude.

Observ. (short for observation): A letter was assigned for each sampling attempt using a specific **Gear Type** at each sampling site**.** At each new site (i.e., each **Site ID)** we would begin with the letter **A** and progress sequentially through the alphabet as new sampling attempts were made with new **Gear Types**. For example if we first set minnow traps, then pulled a beach seine and finally deployed a fyke net at **ABJC001** the **Observ.** column would have an **A, B,** and **C** where **A** represents minnow trap sampling, **B** represents beach seine sampling and **C** represents fyke net sampling. In combination with **Site ID, observ**. Provides a unique location-sample attempt identifier (e.g., **ABJC001A, ABJC001B, ABJC001C**).

Waterbody: Refers to common name of the lake, river, or creek where sampling occurred.

Latitude: Point location of **Site ID** WGS 84 datum

Longitude: Point location of **Site ID** WGS 84 datum

Gear Type: Refers to the specific gear used to make an observation (e.g., to capture fish).

Common Name: Refers to the common name of fish captured for an individual observation record.

Count: Refers to the number of fish captured or observed for an individual observation record.

Site ID	Observ.	Waterbody	Latitude	Longitude	Gear Type	Common Name	Count
ABJC001	A	Albert Johnson Creek	56.79143	157.76270	Minnow trap	coho salmon, silver	5
ABJC002	A	Albert Johnson Creek	56.79129	157.76278	Minnow trap	coho salmon, silver	13
ABJC002	A	Albert Johnson Creek	56.79129	157.76278	Minnow trap	ninespine stickleback	9
ABJC002	B	Albert Johnson Creek	56.79129	157.76278	Minnow trap	coho salmon, silver	30
ABJC002	B	Albert Johnson Creek	56.79129	157.76278	Minnow trap	ninespine stickleback	12
ABJC002	C	Albert Johnson Creek	56.79129	157.76278	Minnow trap	coho salmon, silver	40
ABJC002	C	Albert Johnson Creek	56.79129	157.76278	Minnow trap	ninespine stickleback	19
ABJC003	A	Albert Johnson Creek	56.79064	157.76121	Minnow trap	coho salmon, silver	16
ABJC003	A	Albert Johnson Creek	56.79064	157.76121	Minnow trap	threespine stickleback	1
ABJC004	A	Albert Johnson Creek	56.79003	157.76133	Minnow trap	coho salmon, silver	15
ABJC005	A	Albert Johnson Creek	56.78982	157.76164	Minnow trap	coho salmon, silver	8
ABJC005	A	Albert Johnson Creek	56.78982	157.76164	Minnow trap	Dolly Varden	1
ABJC005	B	Albert Johnson Creek	56.78982	157.76164	Minnow seine	coho salmon, silver	300
ABJC006	A	Albert Johnson Creek	56.79211	157.75892	Minnow seine	coho salmon, silver	20
ABJC006	A	Albert Johnson Creek	56.79211	157.75892	Minnow seine	Dolly Varden	1
ABJC011	A	Albert Johnson Creek	56.79138	157.76294	Minnow trap	coho salmon, silver	4
ABJC012	A	Albert Johnson Creek	56.79184	157.76247	Minnow trap	Dolly Varden	1
ABJC013	A	Albert Johnson Creek	56.79191	157.76082	Minnow trap	coho salmon, silver	4
ABJC013	A	Albert Johnson Creek	56.79191	157.76082	Minnow trap	Dolly Varden	1
ABJC014	A	Albert Johnson Creek	56.79230	157.75990	Minnow trap	coho salmon, silver	17
ABJC014	A	Albert Johnson Creek	56.79230	157.75990	Minnow trap	Dolly Varden	1
ABJC015	A	Albert Johnson Creek	56.79247	157.76048	Minnow trap	coho salmon, silver	17
ABJC015	A	Albert Johnson Creek	56.79247	157.76048	Minnow trap	Dolly Varden	1
ABJC016	A	Albert Johnson Creek	56.78898	157.76264	Minnow trap	coho salmon, silver	36
ABJC016	A	Albert Johnson Creek	56.78898	157.76264	Minnow trap	ninespine stickleback	11
ABJC017	A	Albert Johnson Creek	56.78830	157.76202	Minnow trap	coho salmon, silver	4
ABJC018	A	Albert Johnson Creek	56.78782	157.76459	Minnow trap	coho salmon, silver	14
ABJC018	A	Albert Johnson Creek	56.78782	157.76459	Minnow trap	ninespine stickleback	2
ABJC019	A	Albert Johnson Creek	56.78706	157.76528	Minnow trap	No Fish Collected	0
ABJC020	A	Albert Johnson Creek	56.78600	157.76432	Minnow trap	coho salmon, silver	49
ABJC500	A	Albert Johnson Headwaters	56.76974	157.89931	Minnow seine	coho salmon, silver	6
ABJC501	A	Albert Johnson Headwaters	56.77663	157.89368	Minnow seine	coho salmon, silver	4
ABJC501	A	Albert Johnson Headwaters	56.77663	157.89368	Minnow seine	ninespine stickleback	3
ABJC502	A	Albert Johnson Headwaters	56.77644	157.88938	Minnow trap	coho salmon, silver	14
ABJC502	A	Albert Johnson Headwaters	56.77644	157.88938	Minnow trap	Dolly Varden	8
ABJC503	A	Albert Johnson Headwaters	56.77674	157.88927	Minnow trap	coho salmon, silver	10
ABJC503	A	Albert Johnson Headwaters	56.77674	157.88927	Minnow trap	Dolly Varden	6
ABJC504	A	Albert Johnson Headwaters	56.77603	157.88865	Minnow trap	coho salmon, silver	12
ABJC504	A	Albert Johnson Headwaters	56.77603	157.88865	Minnow trap	Dolly Varden	24
ABJC505	A	Albert Johnson Headwaters	56.77457	157.88517	Minnow trap	coho salmon, silver	18
ABJC505	A	Albert Johnson Headwaters	56.77457	157.88517	Minnow trap	Dolly Varden	19
ABJC506	A	Albert Johnson Headwaters	56.77533	157.88309	Minnow seine	coho salmon, silver	44
ANIA001	A	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	coho salmon, silver	1
ANIA001	A	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	pacific staghorn sculpin	2
ANIA001	B	Tidal Aniakchak River	56.76400	157.49875	Minnow trap	coho salmon, silver	48
ANIA001	B	Tidal Aniakchak River	56.76400	157.49875	Minnow trap	pacific staghorn sculpin	1
ANIA001	B	Tidal Aniakchak River	56.76400	157.49875	Minnow trap	sculpin, undifferentiated	2
ANIA001	C	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	Flatfish unidentified	4

ANIA001	C	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	pacific staghorn sculpin	5
ANIA001	D	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	pacific staghorn sculpin	15
ANIA001	D	Tidal Aniakchak River	56.76400	157.49875	Minnow seine	starry flounder	21
ANIA001	E	Tidal Aniakchak River	56.76400	157.49875	Angling	Dolly Varden	9
ANIA001	E	Tidal Aniakchak River	56.76400	157.49875	Angling	pacific staghorn sculpin	2
ANIA020	A	Tidal Aniakchak River	56.76432	157.49248	Minnow trap	No Fish Collected	0
ANIA020	B	Tidal Aniakchak River	56.76432	157.49248	Angling	Dolly Varden	3
ANIA020	C	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	pacific staghorn sculpin	37
ANIA020	C	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	starry flounder	24
ANIA020	D	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	pacific staghorn sculpin	1
ANIA020	D	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	starry flounder	10
ANIA020	E	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	coho salmon, silver	10
ANIA020	E	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	starry flounder	1
ANIA020	F	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	Dolly Varden	6
ANIA020	F	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	pacific staghorn sculpin	1
ANIA020	G	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	Dolly Varden	11
ANIA020	G	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	pacific staghorn sculpin	3
ANIA020	H	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	coho salmon, silver	6
ANIA020	H	Tidal Aniakchak River	56.76432	157.49248	Minnow seine	pacific staghorn sculpin	5
ANIA021	A	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	Flatfish unidentified	4
ANIA021	B	Tidal Aniakchak River	56.76544	157.50967	Minnow trap	coho salmon, silver	15
ANIA021	C	Tidal Aniakchak River	56.76544	157.50967	Minnow trap	Dolly Varden	2
ANIA021	C	Tidal Aniakchak River	56.76544	157.50967	Minnow trap	pacific staghorn sculpin	1
ANIA021	D	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	coho salmon, silver	43
ANIA021	D	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	starry flounder	9
ANIA021	E	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	coho salmon, silver	4
ANIA021	E	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	Flatfish unidentified	4
ANIA021	E	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	pacific staghorn sculpin	1
ANIA021	E	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	starry flounder	1
ANIA021	F	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	starry flounder	5
ANIA021	G	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	pacific staghorn sculpin	25
ANIA021	G	Tidal Aniakchak River	56.76544	157.50967	Minnow seine	starry flounder	1
ANIA022	A	Tidal Aniakchak River	56.76600	157.50511	Minnow seine	starry flounder	5
ANIA022	B	Tidal Aniakchak River	56.76600	157.50511	Observation	pink salmon	1
ANIA022	C	Tidal Aniakchak River	56.76600	157.50511	Angling	coho salmon, silver	1
ANIA031	A	Tidal Aniakchak River	56.76270	157.49272	Minnow trap	coastrange sculpin	2
ANIA031	A	Tidal Aniakchak River	56.76270	157.49272	Minnow trap	coho salmon, silver	29
ANIR001	A	Aniakchak River	56.79460	157.76769	Minnow trap	coho salmon, silver	4
ANIR001	A	Aniakchak River	56.79460	157.76769	Minnow trap	Dolly Varden	4
ANIR001	B	Aniakchak River	56.79460	157.76769	Minnow trap	coho salmon, silver	18
ANIR001	B	Aniakchak River	56.79460	157.76769	Minnow trap	Dolly Varden	2
ANIR002	A	Aniakchak River	56.79473	157.76657	Minnow trap	coho salmon, silver	3
ANIR002	B	Aniakchak River	56.79473	157.76657	Minnow trap	coho salmon, silver	14
ANIR002	B	Aniakchak River	56.79473	157.76657	Minnow trap	Dolly Varden	9
ANIR003	A	Aniakchak River	56.79461	157.76609	Minnow trap	Dolly Varden	1
ANIR003	B	Aniakchak River	56.79461	157.76609	Minnow trap	coho salmon, silver	2
ANIR003	B	Aniakchak River	56.79461	157.76609	Minnow trap	Dolly Varden	3
ANIR004	A	Aniakchak River	56.79405	157.76564	Minnow trap	coho salmon, silver	2
ANIR004	B	Aniakchak River	56.79405	157.76564	Minnow trap	coho salmon, silver	6
ANIR005	A	Aniakchak River	56.79292	157.76478	Minnow trap	coho salmon, silver	17

ANIR005	B	Aniakchak River	56.79292	157.76478	Minnow trap	coho salmon, silver	4
ANIR010	A	Aniakchak River	56.79465	157.76609	Fyke net	coho salmon, silver	4
ANIR010	A	Aniakchak River	56.79465	157.76609	Fyke net	sockeye salmon, red	5
IRIS001	A	Creek 100	56.76753	157.46231	Minnow trap	coho salmon, silver	2
IRIS002	A	Creek 100	56.77013	157.46164	Minnow trap	coho salmon, silver	5
IRIS002	A	Creek 100	56.77013	157.46164	Minnow trap	Dolly Varden	89
IRIS002	A	Creek 100	56.77013	157.46164	Minnow trap	steelhead, rainbow	8
IRIS003	A	Creek 100	56.77421	157.46321	Minnow trap	coastrange sculpin	1
IRIS003	A	Creek 100	56.77421	157.46321	Minnow trap	Dolly Varden	62
IRIS003	A	Creek 100	56.77421	157.46321	Minnow trap	steelhead, rainbow	2
IRIS004	A	Creek 100	56.77670	157.46535	Minnow trap	Dolly Varden	30
IRIS005	A	Creek 100	56.77913	157.46704	Minnow trap	coastrange sculpin	5
IRIS005	A	Creek 100	56.77913	157.46704	Minnow trap	coho salmon, silver	2
IRIS005	A	Creek 100	56.77913	157.46704	Minnow trap	Dolly Varden	50
IRIS005	A	Creek 100	56.77913	157.46704	Minnow trap	steelhead, rainbow	1
IRIS006	A	Creek 100	56.77950	157.46677	Angling	steelhead, rainbow	1
IRIS007	A	Creek 100	56.77652	157.46445	Angling	Dolly Varden	9
IRIS008	A	Creek 100	56.77590	157.46188	Angling	steelhead, rainbow	1
IRIS009	A	Creek 100	56.77478	157.46088	Angling	steelhead, rainbow	1
IRIS010	A	Creek 100	56.76694	157.46207	Minnow trap	coastrange sculpin	1
IRIS010	A	Creek 100	56.76694	157.46207	Minnow trap	coho salmon, silver	11
IRIS010	A	Creek 100	56.76694	157.46207	Minnow trap	Dolly Varden	63
IRIS010	A	Creek 100	56.76694	157.46207	Minnow trap	steelhead, rainbow	2
IRIS011	A	Creek 100	56.76616	157.46002	Minnow trap	coho salmon, silver	25
IRIS011	A	Creek 100	56.76616	157.46002	Minnow trap	Dolly Varden	40
IRIS011	A	Creek 100	56.76616	157.46002	Minnow trap	steelhead, rainbow	6
IRIS012	A	Creek 100	56.76559	157.45662	Minnow trap	coho salmon, silver	10
IRIS012	A	Creek 100	56.76559	157.45662	Minnow trap	Dolly Varden	51
IRIS012	A	Creek 100	56.76559	157.45662	Minnow trap	steelhead, rainbow	4
IRIS013	A	Creek 100	56.76425	157.45419	Minnow trap	coho salmon, silver	23
IRIS013	A	Creek 100	56.76425	157.45419	Minnow trap	Dolly Varden	18
IRIS013	A	Creek 100	56.76425	157.45419	Minnow trap	steelhead, rainbow	4
IRIS013	B	Creek 100	56.76425	157.45419	Angling	coho salmon, silver	1
IRIS013	C	Creek 100	56.76425	157.45419	Minnow seine	coho salmon, silver	19
IRIS013	C	Creek 100	56.76425	157.45419	Minnow seine	Dolly Varden	1
IRIS014	A	Creek 100	56.76177	157.45012	Minnow trap	coho salmon, silver	12
IRIS014	A	Creek 100	56.76177	157.45012	Minnow trap	Dolly Varden	100
IRIS014	A	Creek 100	56.76177	157.45012	Minnow trap	steelhead, rainbow	8
IRIS014	B	Creek 100	56.76177	157.45012	Angling	steelhead, rainbow	1
IRIS014	C	Creek 100	56.76177	157.45012	Observation	starry flounder	1
IRIS014	D	Creek 100	56.76177	157.45012	Minnow seine	Dolly Varden	2
IRIS015	A	Creek 100	56.76308	157.44810	Minnow trap	coho salmon, silver	30
IRIS015	A	Creek 100	56.76308	157.44810	Minnow trap	Dolly Varden	22
IRIS015	A	Creek 100	56.76308	157.44810	Minnow trap	threespine stickleback	1
IRIS016	A	Creek 100	56.76265	157.44783	Minnow trap	coastrange sculpin	2
IRIS016	A	Creek 100	56.76265	157.44783	Minnow trap	coho salmon, silver	8
IRIS016	A	Creek 100	56.76265	157.44783	Minnow trap	Dolly Varden	35
LANI001	A	Lower Aniakchak River	56.76546	157.51373	Minnow trap	coho salmon, silver	121
LANI001	A	Lower Aniakchak River	56.76546	157.51373	Minnow trap	threespine stickleback	1
LANI002	A	Lower Aniakchak River	56.76620	157.51670	Minnow trap	coho salmon, silver	38

LANI003	A	Lower Aniakchak River	56.76666	157.51822	Minnow trap	coho salmon, silver	57
LANI003	A	Lower Aniakchak River	56.76666	157.51822	Minnow trap	threespine stickleback	6
LANI003	B	Lower Aniakchak River	56.76666	157.51822	Minnow trap	coho salmon, silver	70
LANI003	B	Lower Aniakchak River	56.76666	157.51822	Minnow trap	threespine stickleback	3
LANI003	C	Lower Aniakchak River	56.76666	157.51822	Minnow trap	coho salmon, silver	50
LANI003	C	Lower Aniakchak River	56.76666	157.51822	Minnow trap	threespine stickleback	2
LANI004	A	Lower Aniakchak River	56.76658	157.52145	Minnow trap	coho salmon, silver	59
LANI004	A	Lower Aniakchak River	56.76658	157.52145	Minnow trap	Dolly Varden	1
LANI005	A	Lower Aniakchak River	56.76743	157.52574	Minnow trap	No Fish Collected	0
LANI006	A	Lower Aniakchak River	56.76732	157.52567	Minnow trap	coho salmon, silver	73
LANI006	A	Lower Aniakchak River	56.76732	157.52567	Minnow trap	sockeye salmon, red	1
LANI007	A	Lower Aniakchak River	56.76688	157.52634	Minnow trap	coho salmon, silver	17
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	coastrange sculpin	1
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	coho salmon, silver	47
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	Dolly Varden	1
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	pacific staghorn sculpin	1
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	sockeye salmon, red	11
LANI008	A	Lower Aniakchak River	56.76691	157.52592	Minnow seine	starry flounder	4
LANI010	A	Lower Aniakchak River	56.76757	157.51920	Minnow trap	coho salmon, silver	70
LANI010	A	Lower Aniakchak River	56.76757	157.51920	Minnow trap	ninespine stickleback	2
LANI010	A	Lower Aniakchak River	56.76757	157.51920	Minnow trap	threespine stickleback	1
LANI010	B	Lower Aniakchak River	56.76757	157.51920	Minnow trap	coho salmon, silver	10
LANI010	B	Lower Aniakchak River	56.76757	157.51920	Minnow trap	ninespine stickleback	2
LANI011	A	Lower Aniakchak River	56.76765	157.51032	Minnow trap	coho salmon, silver	37
MESH001	A	Meshik Lake	56.78469	157.92029	Minnow trap	threespine stickleback	1
MESH002	A	Meshik Lake	56.78512	157.92025	Minnow trap	threespine stickleback	3
MESH003	A	Meshik Lake	56.78567	157.92029	Minnow trap	threespine stickleback	32
MESH004	A	Meshik Lake	56.78652	157.92045	Minnow trap	threespine stickleback	31
MESH005	A	Meshik Lake	56.78706	157.92342	Minnow trap	threespine stickleback	12
MESH006	A	Meshik Lake	56.78625	157.92365	Minnow trap	threespine stickleback	12
MESH007	A	Meshik Lake	56.78548	157.92382	Minnow trap	threespine stickleback	9
MESH008	A	Meshik Lake	56.78465	157.92391	Minnow trap	No Fish Collected	0
MESH009	A	Meshik Lake	56.78483	157.93074	Minnow trap	threespine stickleback	1
MESH010	A	Meshik Lake	56.78528	157.93071	Minnow trap	threespine stickleback	2
MESH011	A	Meshik Lake	56.78599	157.93071	Minnow trap	threespine stickleback	7
MESH012	A	Meshik Lake	56.78863	157.93038	Minnow trap	threespine stickleback	4
MESH013	A	Meshik Lake	56.78854	157.93012	Other	threespine stickleback	1
MESH014	A	Meshik Lake	56.78642	157.93339	Other	No Fish Collected	0
MESH100	A	Meshik Lake	56.78532	157.91523	Minnow trap	coho salmon, silver	17
MESH100	A	Meshik Lake	56.78532	157.91523	Minnow trap	threespine stickleback	1
MESH101	A	Meshik Lake	56.78656	157.91582	Minnow trap	threespine stickleback	4
MESH102	A	Meshik Lake	56.78709	157.91612	Minnow trap	threespine stickleback	11
MESH103	A	Meshik Lake	56.78762	157.91649	Minnow trap	threespine stickleback	5
MESH104	A	Meshik Lake	56.79415	157.92432	Minnow trap	threespine stickleback	174
MESH105	A	Meshik Lake	56.79503	157.92467	Minnow trap	No Fish Collected	0
MESH106	A	Meshik Lake	56.79559	157.92417	Minnow trap	threespine stickleback	2
MESH107	A	Meshik Lake	56.79649	157.92403	Minnow trap	coho salmon, silver	1
MESH108	A	Meshik Lake	56.79540	157.93161	Minnow trap	No Fish Collected	0
MESH109	A	Meshik Lake	56.79473	157.93155	Minnow trap	threespine stickleback	15
MESH110	A	Meshik Lake	56.79410	157.93168	Minnow trap	coho salmon, silver	4

MESH110	A	Meshik Lake	56.79410	157.93168	Minnow trap	threespine stickleback	210
MESH111	A	Meshik Lake	56.79354	157.93174	Minnow trap	coho salmon, silver	1
MESH111	A	Meshik Lake	56.79354	157.93174	Minnow trap	threespine stickleback	4
MESH112	A	Meshik Lake	56.78452	157.92948	Minnow seine	coho salmon, silver	2
MESH112	A	Meshik Lake	56.78452	157.92948	Minnow seine	ninespine stickleback	1
MESH112	A	Meshik Lake	56.78452	157.92948	Minnow seine	sockeye salmon, red	28
MESH112	A	Meshik Lake	56.78452	157.92948	Minnow seine	threespine stickleback	29
MESH113	A	Meshik Lake	56.78454	157.93121	Minnow seine	coho salmon, silver	17
MESH113	A	Meshik Lake	56.78454	157.93121	Minnow seine	ninespine stickleback	1
MESH113	A	Meshik Lake	56.78454	157.93121	Minnow seine	sockeye salmon, red	147
MESH113	A	Meshik Lake	56.78454	157.93121	Minnow seine	threespine stickleback	4
MESH200	A	Meshik Lake	56.78734	157.91422	Minnow seine	threespine stickleback	10
MESH201	A	Meshik Lake	56.78845	157.91339	Minnow seine	threespine stickleback	16
MESH202	A	Meshik Lake	56.79688	157.92373	Minnow seine	sockeye salmon, red	3
MESH202	A	Meshik Lake	56.79688	157.92373	Minnow seine	threespine stickleback	3
MESH203	A	Meshik Lake	56.79545	157.93261	Minnow seine	No Fish Collected	0
MESH204	A	Meshik Lake	56.79314	157.93468	Minnow trap	No Fish Collected	0
MESH205	A	Meshik Lake	56.79281	157.93442	Minnow trap	threespine stickleback	4
MESH206	A	Meshik Lake	56.79228	157.93383	Minnow trap	sockeye salmon, red	1
MESH207	A	Meshik Lake	56.79133	157.93315	Minnow trap	No Fish Collected	0
MESH208	A	Meshik Lake	56.78981	157.93585	Minnow trap	No Fish Collected	0
MESH209	A	Meshik River	56.78849	157.93971	Minnow trap	coho salmon, silver	1
MESH209	A	Meshik River	56.78849	157.93971	Minnow trap	threespine stickleback	3
MESH210	A	Meshik River	56.78855	157.94006	Minnow trap	coho salmon, silver	101
MESH210	A	Meshik River	56.78855	157.94006	Minnow trap	Dolly Varden	21
MESH210	A	Meshik River	56.78855	157.94006	Minnow trap	ninespine stickleback	1
MESH210	A	Meshik River	56.78855	157.94006	Minnow trap	threespine stickleback	4
MESH211	A	Meshik River	56.78858	157.94067	Minnow trap	coho salmon, silver	51
MESH211	A	Meshik River	56.78858	157.94067	Minnow trap	Dolly Varden	3
MESH211	A	Meshik River	56.78858	157.94067	Minnow trap	ninespine stickleback	1
MESH211	A	Meshik River	56.78858	157.94067	Minnow trap	threespine stickleback	1
MESH212	A	Meshik River	56.78910	157.94380	Minnow trap	coho salmon, silver	15
MESH212	A	Meshik River	56.78910	157.94380	Minnow trap	threespine stickleback	5
MESH213	A	Meshik River	56.78958	157.94548	Minnow trap	Alaska blackfish	1
MESH214	A	Meshik River	56.78937	157.94688	Minnow trap	Dolly Varden	27
MESH215	A	Meshik Lake	56.78483	157.93247	Minnow seine	coho salmon, silver	11
MESH215	A	Meshik Lake	56.78483	157.93247	Minnow seine	sockeye salmon, red	56
MESH215	A	Meshik Lake	56.78483	157.93247	Minnow seine	threespine stickleback	15
MESH216	A	Meshik Lake	56.78556	157.93461	Minnow seine	coho salmon, silver	65
MESH216	A	Meshik Lake	56.78556	157.93461	Minnow seine	ninespine stickleback	1
MESH216	A	Meshik Lake	56.78556	157.93461	Minnow seine	sockeye salmon, red	11
MESH216	A	Meshik Lake	56.78556	157.93461	Minnow seine	threespine stickleback	24
MESH217	A	Meshik Lake	56.78575	157.93684	Minnow seine	coho salmon, silver	32
MESH217	A	Meshik Lake	56.78575	157.93684	Minnow seine	sockeye salmon, red	90
MESH217	A	Meshik Lake	56.78575	157.93684	Minnow seine	threespine stickleback	94
MESH300	A	Meshik Lake	56.79003	157.92435	Experimental gill net	Dolly Varden	3
MESH302	A	Meshik Lake	56.79684	157.92284	Minnow seine	coho salmon, silver	1
MESH302	A	Meshik Lake	56.79684	157.92284	Minnow seine	sockeye salmon, red	332
MESH302	A	Meshik Lake	56.79684	157.92284	Minnow seine	threespine stickleback	12
MESH303	A	Meshik Lake	56.79726	157.92590	Minnow seine	coho salmon, silver	38

MESH303	A	Meshik Lake	56.79726	157.92590	Minnow seine	sockeye salmon, red	11
MESH303	A	Meshik Lake	56.79726	157.92590	Minnow seine	threespine stickleback	4
MESH400	A	Meshik River	56.79033	157.95098	Minnow seine	sockeye salmon, red	3
MESH401	A	Meshik River	56.78917	157.95047	Observation	sculpin, undifferentiated	0
MESH402	A	Meshik River	56.78852	157.95176	Minnow seine	coho salmon, silver	35
MESH402	A	Meshik River	56.78852	157.95176	Minnow seine	Dolly Varden	4
MESH403	A	Meshik River	56.78854	157.95164	Minnow trap	coho salmon, silver	35
MESH403	A	Meshik River	56.78854	157.95164	Minnow trap	Dolly Varden	8
MESH403	A	Meshik River	56.78854	157.95164	Minnow trap	sockeye salmon, red	9
MESH403	A	Meshik River	56.78854	157.95164	Minnow trap	threespine stickleback	1
MESH404	A	Meshik River	56.78930	157.95015	Minnow trap	coho salmon, silver	11
MESH405	A	Meshik River	56.78939	157.95096	Minnow trap	coho salmon, silver	4
MESH406	A	Meshik River	56.78965	157.95260	Minnow trap	coho salmon, silver	1
MESH406	A	Meshik River	56.78965	157.95260	Minnow trap	Dolly Varden	1
MESH407	A	Meshik River	56.79040	157.95212	Minnow trap	coho salmon, silver	1
MESH408	A	Meshik River	56.78810	157.95531	Minnow trap	coho salmon, silver	139
MESH408	A	Meshik River	56.78810	157.95531	Minnow trap	Dolly Varden	1
MESH408	A	Meshik River	56.78810	157.95531	Minnow trap	sockeye salmon, red	1
MESH409	A	Meshik River	56.78733	157.95707	Minnow trap	coho salmon, silver	5
MESH409	A	Meshik River	56.78733	157.95707	Minnow trap	Dolly Varden	1
MESH410	A	Meshik River	56.78630	157.95639	Minnow trap	coho salmon, silver	1
MESH410	A	Meshik River	56.78630	157.95639	Minnow trap	threespine stickleback	1
MESH411	A	Meshik River	56.78655	157.95674	Minnow seine	coho salmon, silver	6
MESH411	A	Meshik River	56.78655	157.95674	Minnow seine	Dolly Varden	1
MESH412	A	Meshik River	56.79063	157.95207	Minnow seine	coho salmon, silver	2
MESH412	A	Meshik River	56.79063	157.95207	Minnow seine	sockeye salmon, red	1
MESH413	A	Meshik River	56.78826	157.95072	Minnow seine	sockeye salmon, red	2
SURP001	A	Surprise Lake	56.92202	158.11132	Minnow trap	No Fish Collected	0
SURP002	A	Surprise Lake	56.92217	158.11118	Minnow trap	Dolly Varden	15
SURP002	A	Surprise Lake	56.92217	158.11118	Minnow trap	sockeye salmon, red	3
SURP003	A	Surprise Lake	56.92224	158.11115	Minnow trap	Dolly Varden	20
SURP004	A	Surprise Lake	56.92317	158.10928	Minnow trap	Dolly Varden	30
SURP004	A	Surprise Lake	56.92317	158.10928	Minnow trap	sockeye salmon, red	6
SURP005	A	Surprise Lake	56.92458	158.11582	Minnow trap	Dolly Varden	13
SURP005	A	Surprise Lake	56.92458	158.11582	Minnow trap	sockeye salmon, red	14
SURP006	A	Surprise Lake	56.92459	158.11578	Minnow trap	Dolly Varden	8
SURP006	A	Surprise Lake	56.92459	158.11578	Minnow trap	sockeye salmon, red	2
SURP007	A	Surprise Lake	56.92459	158.11577	Minnow trap	Dolly Varden	47
SURP008	A	Surprise Lake	56.92507	158.11441	Minnow trap	Dolly Varden	47
SURP009	A	Surprise Lake	56.92336	158.11254	Other	Dolly Varden	7
SURP010	A	Surprise Lake	56.92386	158.11159	Other	Dolly Varden	14
SURP011	A	Surprise Lake	56.91923	158.10848	Minnow trap	Dolly Varden	8
SURP011	A	Surprise Lake	56.91923	158.10848	Minnow trap	sockeye salmon, red	4
SURP012	A	Surprise Lake	56.91948	158.10794	Minnow trap	Dolly Varden	20
SURP012	A	Surprise Lake	56.91948	158.10794	Minnow trap	sockeye salmon, red	2
SURP013	A	Surprise Lake	56.91960	158.10764	Minnow trap	Dolly Varden	38
SURP014	A	Surprise Lake	56.92222	158.10443	Minnow trap	Dolly Varden	55
SURP015	A	Surprise Lake	56.92791	158.11895	Minnow trap	Dolly Varden	2
SURP016	A	Surprise Lake	56.92800	158.11894	Minnow trap	Dolly Varden	2
SURP016	A	Surprise Lake	56.92800	158.11894	Minnow trap	sockeye salmon, red	15

SURP017	A	Surprise Lake	56.92804	158.11879	Minnow trap	Dolly Varden	5
SURP017	A	Surprise Lake	56.92804	158.11879	Minnow trap	sockeye salmon, red	2
SURP018	A	Surprise Lake	56.92890	158.11795	Minnow trap	Dolly Varden	65
SURP019	A	Surprise Lake	56.92386	158.11291	Other	No Fish Collected	0
SURP020	A	Surprise Lake	56.92353	158.11338	Other	Dolly Varden	8
SURP021	A	Surprise Lake	56.92681	158.09248	Beach seine	sockeye salmon, red	5
SURP022	A	Surprise Lake	56.92991	158.09294	Beach seine	No Fish Collected	0
SURP023	A	Surprise Lake	56.93410	158.10368	Beach seine	sockeye salmon, red	2
SURP024	A	Surprise Lake	56.93377	158.11628	Beach seine	No Fish Collected	0
SURP025	A	Surprise Lake	56.93118	158.12187	Beach seine	sockeye salmon, red	1
SURP030	A	Surprise Lake	56.91889	158.10881	Beach seine	Dolly Varden	9
SURP030	A	Surprise Lake	56.91889	158.10881	Beach seine	sockeye salmon, red	27
SURP031	A	Surprise Lake	56.91765	158.10212	Beach seine	Dolly Varden	2
SURP031	A	Surprise Lake	56.91765	158.10212	Beach seine	sockeye salmon, red	225
SURP032	A	Marsh between I9 and I10	56.93425	158.12128	Minnow seine	Dolly Varden	7
SURP033	A	Creek I9	56.93517	158.12169	Minnow seine	Dolly Varden	18
SURP034	A	Creek I9	56.93710	158.12755	Minnow seine	Dolly Varden	3
SURP040	A	Surprise Lake	56.92388	158.09646	Minnow trap	Dolly Varden	41
SURP041	A	Surprise Lake	56.92374	158.09430	Minnow trap	Dolly Varden	47
SURP042	A	Surprise Lake	56.92366	158.09367	Minnow trap	Dolly Varden	7
SURP042	A	Surprise Lake	56.92366	158.09367	Minnow trap	sockeye salmon, red	11
SURP043	A	Surprise Lake	56.92353	158.09339	Minnow trap	No Fish Collected	0
SURP044	A	Surprise Lake	56.92023	158.09401	Minnow trap	Dolly Varden	47
SURP045	A	Surprise Lake	56.92027	158.09214	Minnow trap	Dolly Varden	61
SURP046	A	Surprise Lake	56.92026	158.09191	Minnow trap	Dolly Varden	1
SURP047	A	Surprise Lake	56.92040	158.09165	Minnow trap	Dolly Varden	11
SURP048	A	Surprise Lake	56.92266	158.09067	Beach seine	Dolly Varden	1
SURP048	A	Surprise Lake	56.92266	158.09067	Beach seine	sockeye salmon, red	173
SURP049	A	Surprise Lake	56.91699	158.08992	Beach seine	Dolly Varden	3
SURP049	A	Surprise Lake	56.91699	158.08992	Beach seine	sockeye salmon, red	333
SURP050	A	Surprise Lake	56.91421	158.08926	Beach seine	sockeye salmon, red	139
SURP051	A	Surprise Lake	56.91253	158.09518	Beach seine	sockeye salmon, red	123
SURP052	A	Surprise Lake	56.91743	158.10074	Beach seine	sockeye salmon, red	151
SURP053	A	Surprise Lake	56.92991	158.09353	Minnow trap	Dolly Varden	6
SURP053	A	Surprise Lake	56.92991	158.09353	Minnow trap	sockeye salmon, red	5
SURP054	A	Surprise Lake	56.92984	158.09383	Minnow trap	Dolly Varden	29
SURP055	A	Surprise Lake	56.92982	158.09398	Minnow trap	Dolly Varden	75
SURP056	A	Surprise Lake	56.92951	158.09511	Minnow trap	Dolly Varden	36
SURP057	A	Surprise Lake	56.93338	158.09842	Minnow trap	Dolly Varden	2
SURP057	A	Surprise Lake	56.93338	158.09842	Minnow trap	sockeye salmon, red	10
SURP058	A	Surprise Lake	56.93322	158.09872	Minnow trap	Dolly Varden	26
SURP058	A	Surprise Lake	56.93322	158.09872	Minnow trap	sockeye salmon, red	1
SURP059	A	Surprise Lake	56.93288	158.09898	Minnow trap	Dolly Varden	44
SURP060	A	Surprise Lake	56.93247	158.09958	Minnow trap	Dolly Varden	23
SURP061	A	Surprise Lake	56.92347	158.11403	Beach seine	sockeye salmon, red	8
SURP070	A	Surprise Lake outlet	56.91113	158.09403	Minnow trap	sockeye salmon, red	2
SURP071	A	Surprise Lake outlet	56.90799	158.08919	Minnow trap	No Fish Collected	0
SURP072	A	Surprise Lake outlet	56.90648	158.08705	Minnow trap	Dolly Varden	3
SURP073	A	Surprise Lake outlet	56.90555	158.08516	Minnow trap	No Fish Collected	0
SURP075	A	Surprise Lake	56.92272	158.10964	Minnow trap	Dolly Varden	36

WILL001	A	Creek 200	56.80168	157.44383	Minnow trap	No Fish Collected	0
WILL002	A	Creek 200	56.80171	157.44394	Minnow trap	threespine stickleback	3
WILL003	A	Creek 200	56.80203	157.44409	Minnow trap	coastrange sculpin	1
WILL003	A	Creek 200	56.80203	157.44409	Minnow trap	Dolly Varden	1
WILL003	A	Creek 200	56.80203	157.44409	Minnow trap	threespine stickleback	1
WILL004	A	Creek 200	56.80240	157.44418	Minnow trap	No Fish Collected	0
WILL005	A	Creek 200	56.80252	157.44455	Minnow trap	Dolly Varden	1