State of Alaska
Department of Fish and Game
Sportfish Division

Nomination Form
Fish Distribution Database

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FISH & GAME

Region: Arctic

USGS Quad: Ikpikpuk River D1, Teshekpuk A1, A2, Harrison Bay A5

Fish Distribution Database Number of Waterway: 330-00-10840-XXXX 2201-3050-4033 4020 4030

Name of Waterway: Fish Creek (West Fork) ☑ USGS Name ☑ Local Name

☑ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #: 04 099		AHUG	9/21/04
Revision Year: 2005	Fisheries Scientist		Date
Revision to: Atlas ____ Catalog ____ Both ✓	FDD Project Biologist		2 Jan 04 Date
Revision Code: A-Z	Drafted		11/4/04 Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Broad Whitefish	1981 (Bendock and Burr 1984)			See Below	☑
					☐
					☐
					☐
					☐

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:

The West Fork of Fish Creek is nominated from its confluence with the East Fork of Fish Creek (nominated channels in blue) to the upper most connected lake containing anadromous fish (Lake B84050, sampled in 1981 by Bendock and Burr (1984 report) contained anadromous broad whitefish, along with ninespine stickleback, and lake trout). The area of interest is outlined in black on the attached map. Years of fyke-net data and two years of telemetry data clearly indicate that connected lakes within this area are used heavily by anadromous broad whitefish (Morris 2003, Moulton 2000, 2002). One tundra lake/stream complex slightly to the east is nominated as well, it is driectly connected to areas of known use and is ideal broad whitefish habitat. The system is marked in blue and connected lakes with blue polygons. Lakes marked with red circles de-note lakes sampled and containing andromous fish while lakes marked with blue polygons indicate lakes likely used but not sampled. Only lakes/streams connected to systems with documented anadromous use, consistent with research efforts in the area, have been nominated.

Add new streams & lakes w/ wp (see nom 04-098)

Name of Observer (please print): William Morris

Signature: [signature]

Date: 11/28/2003

Address: 1300 College Road
Fairbanks, AK 99701

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 Fish Distribution Database.

Signature of Area Biologist: [signature]

Name of Area Biologist (please print): John Burr

Revision 04/03

6

Burbot

Burbot within the study group used the Fish Creek, Judy Creek, Inigok Creek and Ublutuoch River systems but used tributary streams and lakes less frequently than Arctic grayling (Figure 16). However, burbot readily moved long distances within the main channel habitats of Inigok Creek, Fish Creek, Judy Creek and one small meandering tributary of Judy Creek. Burbot also used the lower several kilometers of the Ublutuoch River within the lowest gradient reach of the system; habitats upstream from the deepest portion of the Ublutuoch River were not used by burbot (Figure 16). Burbot were relocated as far upstream in Inigok Creek as 30 km from the mouth; however, the majority of relocations for burbot occurred within the lower 10 km of Judy Creek and the 40 km stretch of Fish Creek upstream from the mouth of the Ublutuoch River. Burbot were relocated in a small tributary of Judy Creek, roughly 35 km upstream from its confluence with Judy Creek, in both 2001 and 2002 (Figure 16).

Burbot relocation rates were reasonably high throughout the study and although each fish was not relocated during each tracking event, all burbot were relocated during at least one tracking event after break-up 2002. Most notable from the burbot tracking conducted during 2001/2002 were the expansive movements throughout the systems. Burbot 1352 remained in the same 10 km stretch of Fish Creek, upstream from Judy Creek, from the time it was tagged in August 2001 through late-June 2002. By mid-August 2002, the fish was 25 km farther upstream in Fish Creek from its June location. This fish represents the most sedentary burbot of the eight tagged. Some fish made extensive movements up nearby drainages. Burbot 1326, for example, was relocated 30 km upstream in Inigok Creek in June 2002. Upon its last relocation in late-September 2001 the fish was downstream 10 km from Judy Creek in Fish Creek. This fish moved minimally 100 km between freeze-up 2001 and mid-June 2002. The first burbot tagged in the study (Burbot 0176) on 27 June 2001, moved several kilometers upstream in Judy Creek and by 20 September 2001 was over 35 km upstream in a small tributary to Judy Creek. Late-November radio-tracking relocated the same burbot some 70 km away in the lower Ublutuoch River. By mid-August 2002 the fish had moved upstream of Judy Creek in Fish Creek, another 30 km movement from its November 2001 location. Burbot 1380 exhibited similar movements up the same small Judy Creek tributary during summer 2002, moving minimally 30 to 40 km between

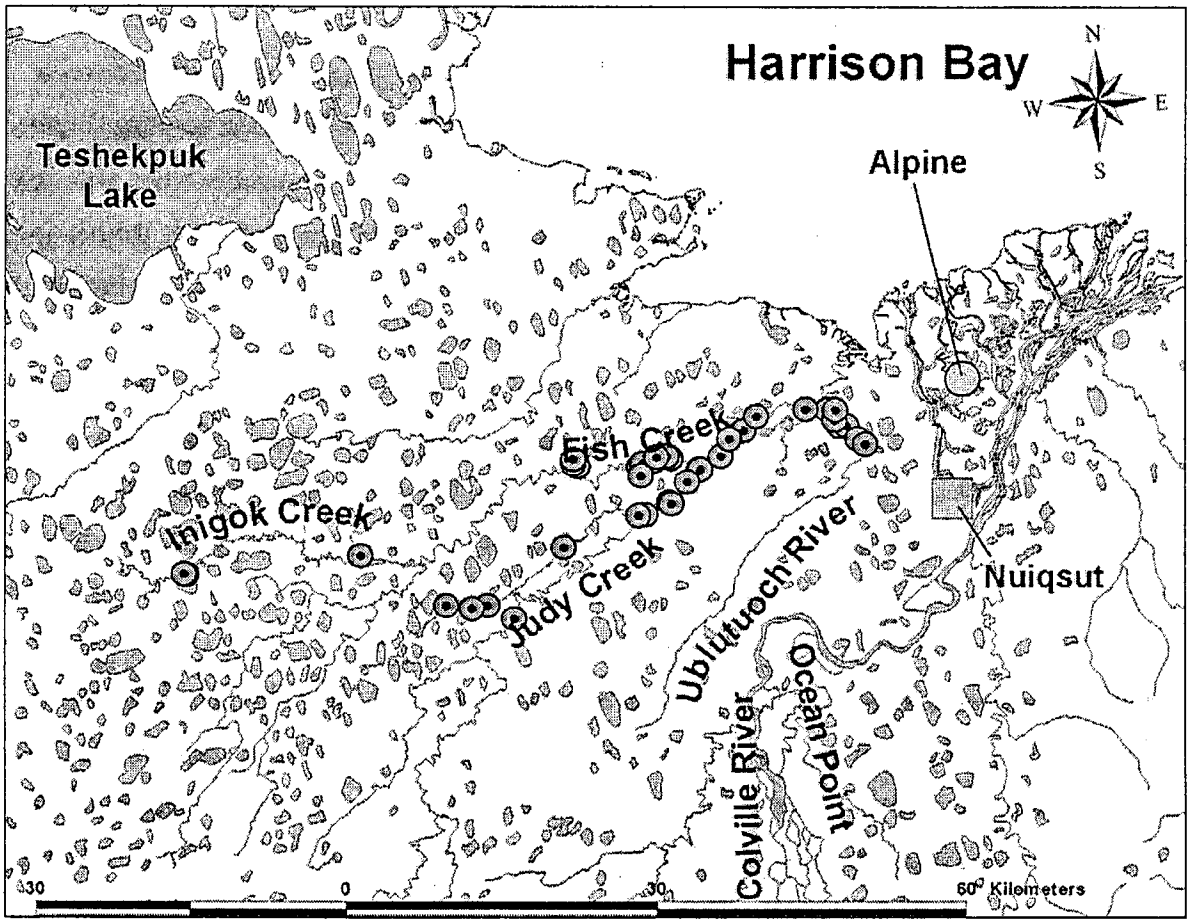


Figure 16. Map of all burbot relocations from June 2001 through June August 2002. The map illustrates the geographic areas and the extent of system use by the tagged population of burbot in the study program.

relocations in summer 2002. While no burbot were outfitted with transmitters in the Ublutuoch River, four of the eight radio-tagged burbot used the Ublutuoch River during the study. Complete movements histories are provided for each fish in Appendix III.

Broad Whitefish

Broad whitefish within the study group exhibited the most diverse movement patterns, readily using main channel habitats, small off-channel systems and numerous lakes within the study area (Figure 17). Broad whitefish movements within the Fish Creek/Judy Creek complex exhibited similar movements to radio-tagged burbot and Arctic grayling and upstream relocation extremes were nearly identical. The majority of broad whitefish relocations occurred within the lower 15 km of the Ublutuoch River and that portion of Fish Creek upstream from the Ublutuoch River

roughly 5 km. Most relocations in lower Fish Creek occurred within the drainages associated with Lake MC7916. Unlike movements of burbot and Arctic grayling, broad whitefish used freshwater habitats within the Colville River as well. This movement required a short easterly migration into Harrison Bay to enter one of the Colville River delta's distributaries. Most fish moved upstream of the delta head towards or to Ocean Point. All Colville River relocations were from just downstream of the Itkillik River to Ocean Point (Figure 17).

Fish Creek and Judy Creek Broad Whitefish

Broad whitefish relocation success rates were consistently high (Table 3), even though the amphidromous life style of the species enables them to move between freshwater systems along the coast. Four broad whitefish likely moved to distant river systems along the coast shortly after being tagged. Broad whitefish 1315 and 0725 were tagged in the Ublutuoch River during summer 2001; both were relocated successfully within a few days of tagging and then left the study area. Two broad whitefish tagged on 25 June 2001 in Lake MC7916 also left the study area within a few days of being tagged (0103 and 0091). Broad whitefish 0103 had moved into Fish Creek a few kilometers upstream from the lake by 28 June 2001, and was never relocated again. Broad whitefish 0091 was relocated within Lake MC7916 on 28 June 2001; the fish was never relocated after that date. These four fish immediately left the study area and represent 19% of our radio-tagged broad whitefish. Two broad whitefish appeared relatively sedentary and never were relocated outside of the Ublutuoch River. Broad whitefish 0548 and 0200 were both tagged in July 2001 and subsequently made movements into the lower portion of the Ublutuoch River during winter. They made only slight upstream movements within the drainage during summer 2002. However, the two fish may have moved more extensively than their tracking results indicated. Broad whitefish 0520 also was tagged in July 2001 within the Ublutuoch River and typically was relocated within the Ublutuoch River during tracking events, although on one occasion the fish ventured 25 kilometers upstream in Fish Creek. The fish remained in the Ublutuoch River through 25 July; however, by 16 August 2001 the fish had moved some 12 km downstream in the Ublutuoch River and then upstream in Fish Creek roughly 25 km. Subsequent tracking on 20 September 2001 relocated the fish back within the lower 10 km of the Ublutuoch River. The two fish showing more sedentary movements may have made similar and undetected movements between relocation events.

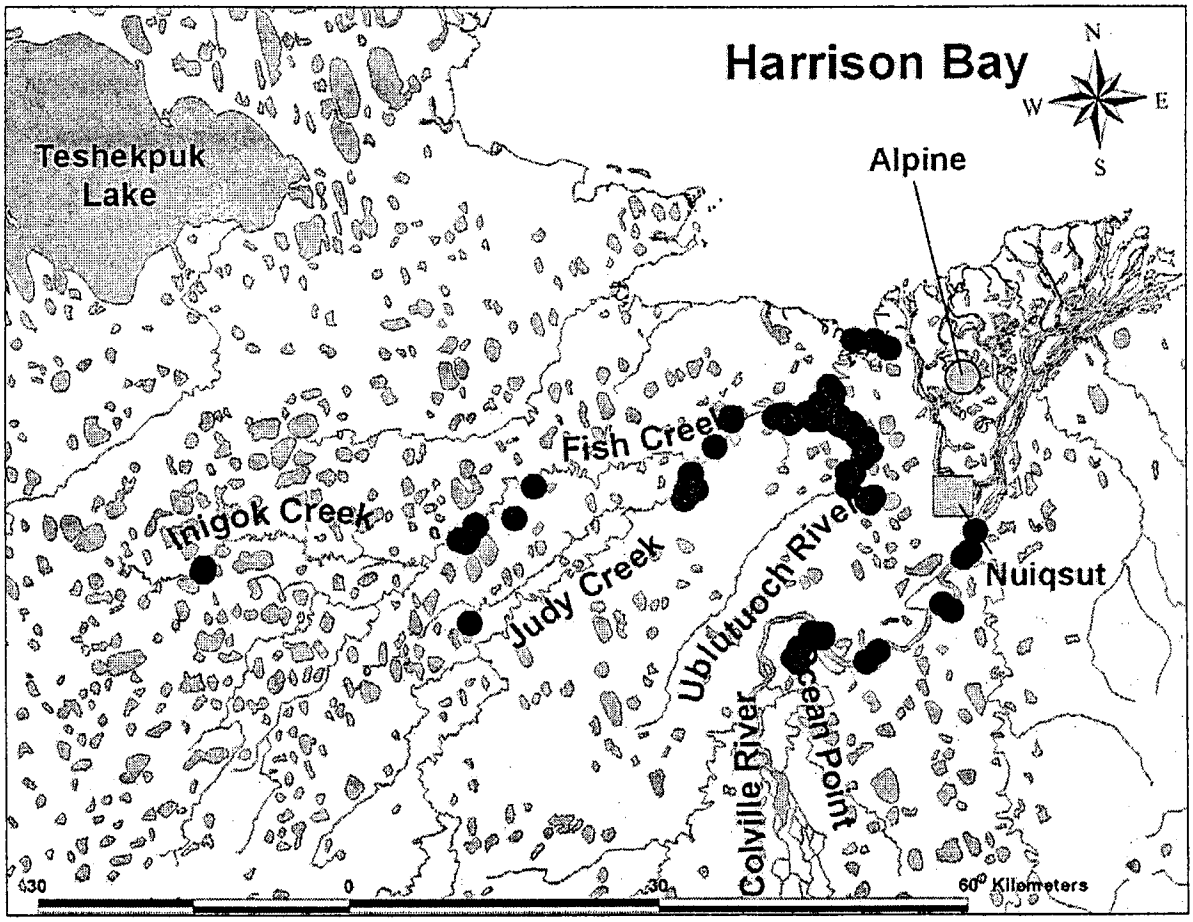


Figure 17. Map of all broad whitefish relocations from August 2001 through June 2002. The map illustrates the geographic areas and the extent of system use by the tagged population of broad whitefish in the study program.

The majority of broad whitefish within the study group remained within the freshwater systems of the Fish Creek/Judy Creek/Ublutuoch River complex (Appendix III). Many made extensive movements within the main channels and to lakes and tributary systems.

Areas of use and extents of upstream movements were similar to those observed with Arctic grayling and burbot. Broad whitefish 0519 was tagged in the Ublutuoch River during June 2001 and remained there until sometime after break-up 2002. It was relocated on 15 August 2002 some 70 km away in a lake off-channel from the small Judy Creek tributary that was also used by tagged burbot and Arctic grayling. Broad whitefish 0184 illustrates a within season nomadic

movement pattern observed with several broad whitefish in the study and observed with broad whitefish studied in the Sagavanirktok River region near Prudhoe Bay (Morris 2000). The fish was tagged in the Ublutuoch River in June 2001, moved to Lake MC7916 off of Fish Creek by 12 July 2001, returned to the Ublutuoch River by 30 August 2001, and finally proceeded to the lower 4 km of Judy Creek for wintering. This fish almost certainly did not survive the winter in lower Judy Creek; all mid- and post-break-up relocations occurred slightly farther downstream as the season progressed, suggesting downstream drifting of the carcass (see map in Appendix III). Broad whitefish 0518 moved the furthest distance within the study area in the shortest time period when it moved 75 km from the Ublutuoch River to upper Fish Creek between 20 July and 25 July 2001. The fish subsequently moved upstream in Fish Creek to winter; wintering survival was not conclusively determined for this fish. Similar to Arctic grayling and burbot in the region, broad whitefish used off-channel and main channel habitats within Inigok Creek. Broad whitefish 1506, tagged in the Ublutuoch River, appeared to winter within the Ublutuoch River during winter 2001/2002 and then moved into the Inigok Creek drainage where it was relocated in a small off-channel lake during June and August 2002 surveys..

Colville River Broad Whitefish

A group of five broad whitefish migrated from the Fish Creek/Judy Creek/Ublutuoch River area to winter in the Colville River during winter 2001/2002. These five broad whitefish (~24%, [0847, 0778, 0776, 0104 and 0102]) each returned to systems within the northeast NPR-A the following open water season. Broad whitefish 0847 was tagged in the Ublutuoch River in June 2001, was first relocated in a small inside channel at Ocean Point in the Colville River (a channel system located just east of the inside meander of the main channel) on 20 September 2001, wintered just downstream of Ocean Point, moved to Lake MC7916 in lower Fish Creek by 25 June 2002 and by 15 August 2002 had returned to the Ublutuoch River and was relocated in a small off channel lake. This same small lake was used by three Arctic grayling and another broad whitefish during summer 2002. Another broad whitefish tagged in the Ublutuoch River during late-June 2001 was not relocated again until 4 May 2002, when it was relocated in the Colville River between the mouth of the Itkillik River and Ocean Point. During break-up the fish was relocated just downstream from the Itkillik River; however, by June 2002 the fish had returned to the lower Ublutuoch River and was relocated in the same general area of the

Ublutuoch River during mid-August 2002. Broad whitefish 0776 was tagged in the Ublutuoch River in July 2001 and was next relocated roughly one month later in the Colville River downstream from Ocean Point. By 20 September 2001 the fish had moved to the same inside channel of Ocean Point as fish 0847. The fish subsequently was relocated in June and August 2002 in a small off-channel lake off the Ublutuoch River with fish 0847 (and three Arctic grayling). Broad whitefish 0102 also used the Colville River during winter 2001/2002. The fish was tagged in June 2001 in Lake MC7916 and was not relocated again until 23 November 2001 when it was relocated in the Colville River near the mouth of the Itkillik River. Break-up surveys again relocated the fish in generally the same area of the Colville River; however, by late-June 2002 the fish had moved back into Fish Creek but was located roughly 50 km upstream in a lake at the head of a small 4 km long tundra drainage.

Broad whitefish 0104 is perhaps the most interesting of the Colville River broad whitefish as the fish made multiple movements between the Fish Creek area and the Colville River. The fish was initially tagged in Lake MC7916 in late-June 2001 where it remained until at least 12 July 2001. By 25 July 2001 the fish was relocated in the Colville River in the small inside channel used by other broad whitefish (discussed above). This broad whitefish spent the entire fall and winter within the small channel of the Colville River and was relocated there on 22 May 2002. Late-June surveys later relocated the fish in a small lake adjacent to Lake MC7916 within the same drainage system in lower Fish Creek. Surveys flown in August 2002 relocated the fish back in the same channel at Ocean Point in the Colville River. This same channel was used during winter 1998/1999 by at least one broad whitefish radio-tagged in the Prudhoe Bay area near the Sagavanirktok River during 1998. Additionally, another broad whitefish from that study was captured in a subsistence net likely just downstream from Ocean Point (Morris 2000).

Statistically significant differences in the size of fish between broad whitefish using the Colville River and other broad whitefish within the study group were not detected (Wilcoxin Rank Sum Mean Rank Colville = 12.4, Mean Rank non-Colville = 10.6, Exact $p = 0.72$). Sample sizes were markedly different with only five fish going to the Colville River and 17 fish never going to the Colville River. Median size for broad whitefish relocated in the Colville River was 485 mm whereas the median size for the remaining broad whitefish was 454 mm; however, the mean

lengths were nearly identical (Colville = 478 mm, non-Colville = 472 mm). Information on fish condition, while noted for many fish, was inadequate to perform any additional comparative analyses. Appendix II presents descriptive and comparative statistics for Colville River broad whitefish.

Wintering Areas

Location of wintering areas throughout this region of the northeast NPR-A was identified as a major goal for this research. Several have been identified as significant for fish using the Fish Creek/Judy Creek/Ublutuoch River drainages. Determination of wintering areas first concentrated on winter relocation data for each species (Figures 18 – 20). Only two Arctic grayling were definitively relocated at wintering areas; one in the lower Ublutuoch River and one in Fish Creek (Figure 18). Burbot winter relocations were similar. Three were found within the lower Ublutuoch River between November 2001 and May 2002, and one burbot successfully overwintered in Fish Creek just upstream from Judy Creek (Figure 19). Broad whitefish winter relocations were more numerous but generally were located within the same areas with some exceptions (Figure 20). Broad whitefish used the Ublutuoch River, Fish Creek, Judy Creek and the Colville River for wintering. The Colville River was used by 24% of broad whitefish tagged while the lower Ublutuoch River was used by 33% of broad whitefish tagged in 2001. Additionally, several deep lakes off of Fish, Judy and Inigok creeks were likely used for wintering by fish. Some broad whitefish tagged in 2001 moved to deep off-channel lakes in summer 2002. It is unknown if these fish wintered in the lakes during winter 2002/2003.

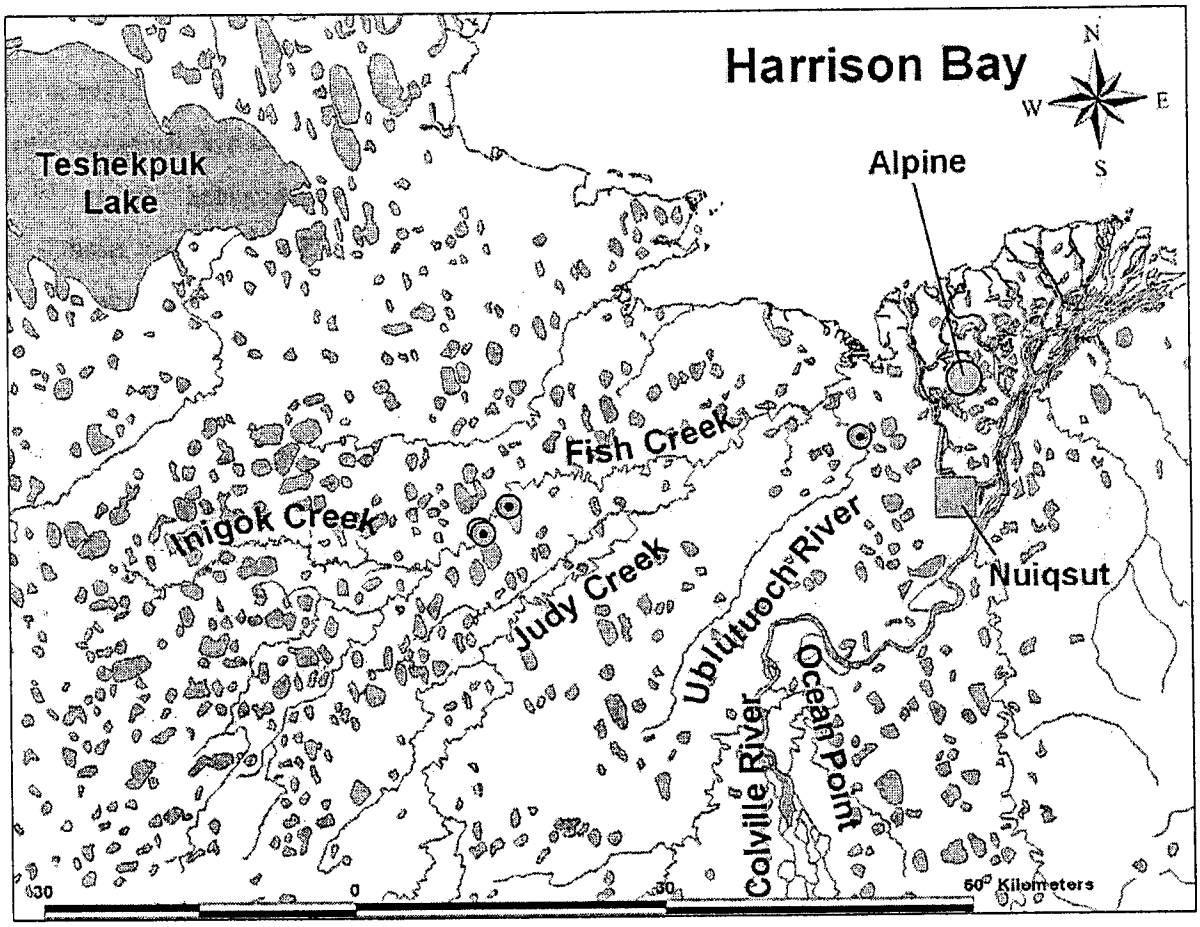
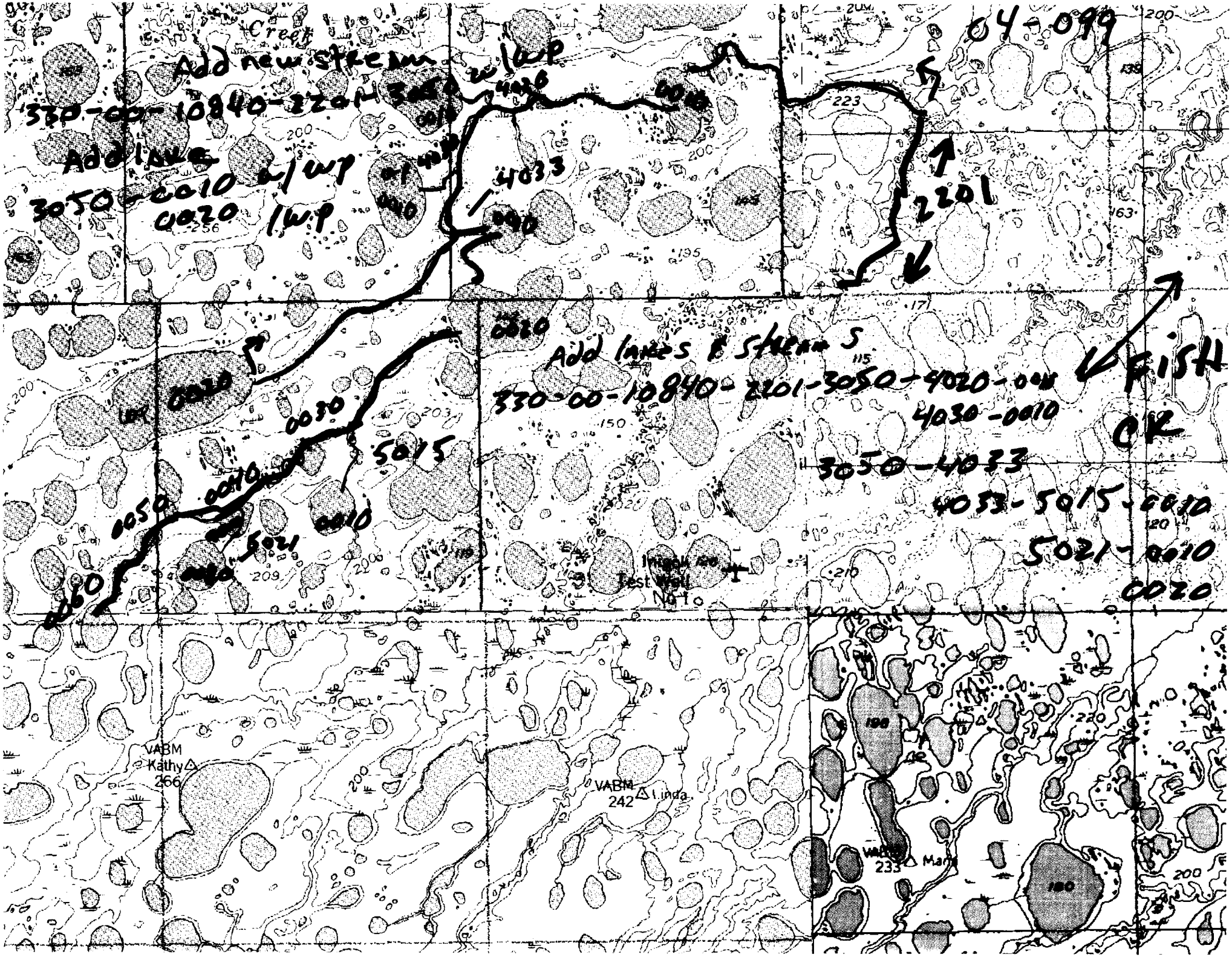


Figure 18. Arctic grayling November 2001/May 2002 relocations were limited and occurred only in the Ublutuoch River and in upper Fish Creek. However, the Arctic grayling using upper Fish Creek may not have survived winter 2001/2002.



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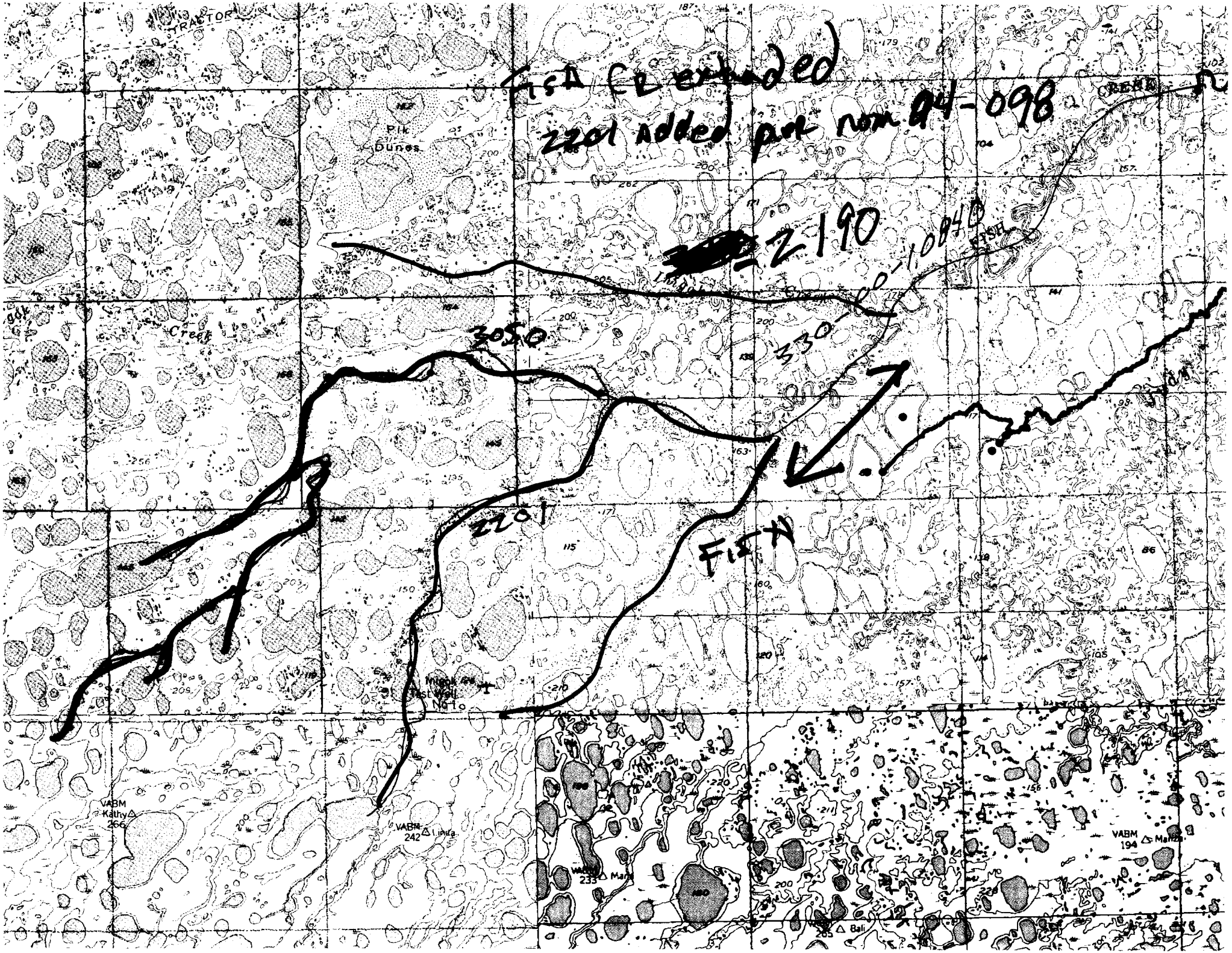

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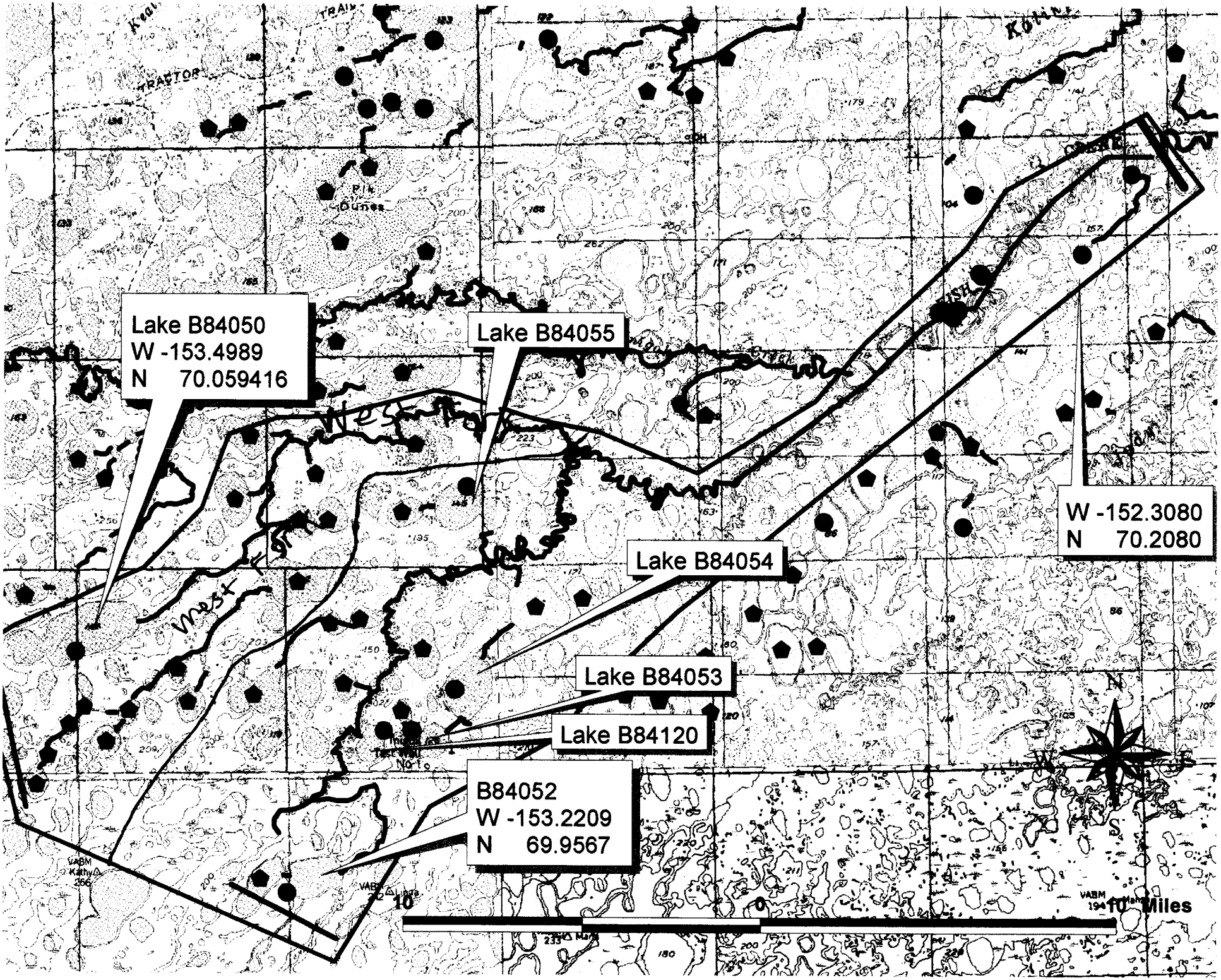
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