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

1988
Year of Revision

Anadromous Water Catalog Volume Arctic V

USGS Quad 104 Bendeleben A-3

Name of Waterway Trib to Boston Creek

Anadromous Water Catalog Number of Waterway

333-20-10670-2521-3058

Change to _____ Atlas

_____ Catalog

X Both

Addition X

Deletion _____

Correction _____

Name addition:

USGS name _____

Local name _____

ALASKA DEPT. OF FISH & GAME
MAR 19 1987
REGION II
HABITAT DIVISION

For Office Use

Nomination # 88-190

[signature] 3-18-87
Regional Supervisor Date

[signature] 12/2/87

FI 11/30/87
Drafted Date

Species	Date(s) Observed	Spawning	Rearing	Migration
Chum	July 23 + 24, 1986			X

Comments: Provide any clarifying information, including number of fish observed, location of fish survey data, etc.

See attached Report Fish River Fish Inventory By Joe Webb

Attach a copy of a map showing location of mouth and upper points of each species, specific stream reaches identified for spawning or rearing, locations of barriers, such as falls. Attach a copy of the fish survey data, if available.

Name of Observer (please print) Joseph F. Webb

Date: 3/18/87 Signature: Joseph F. Webb

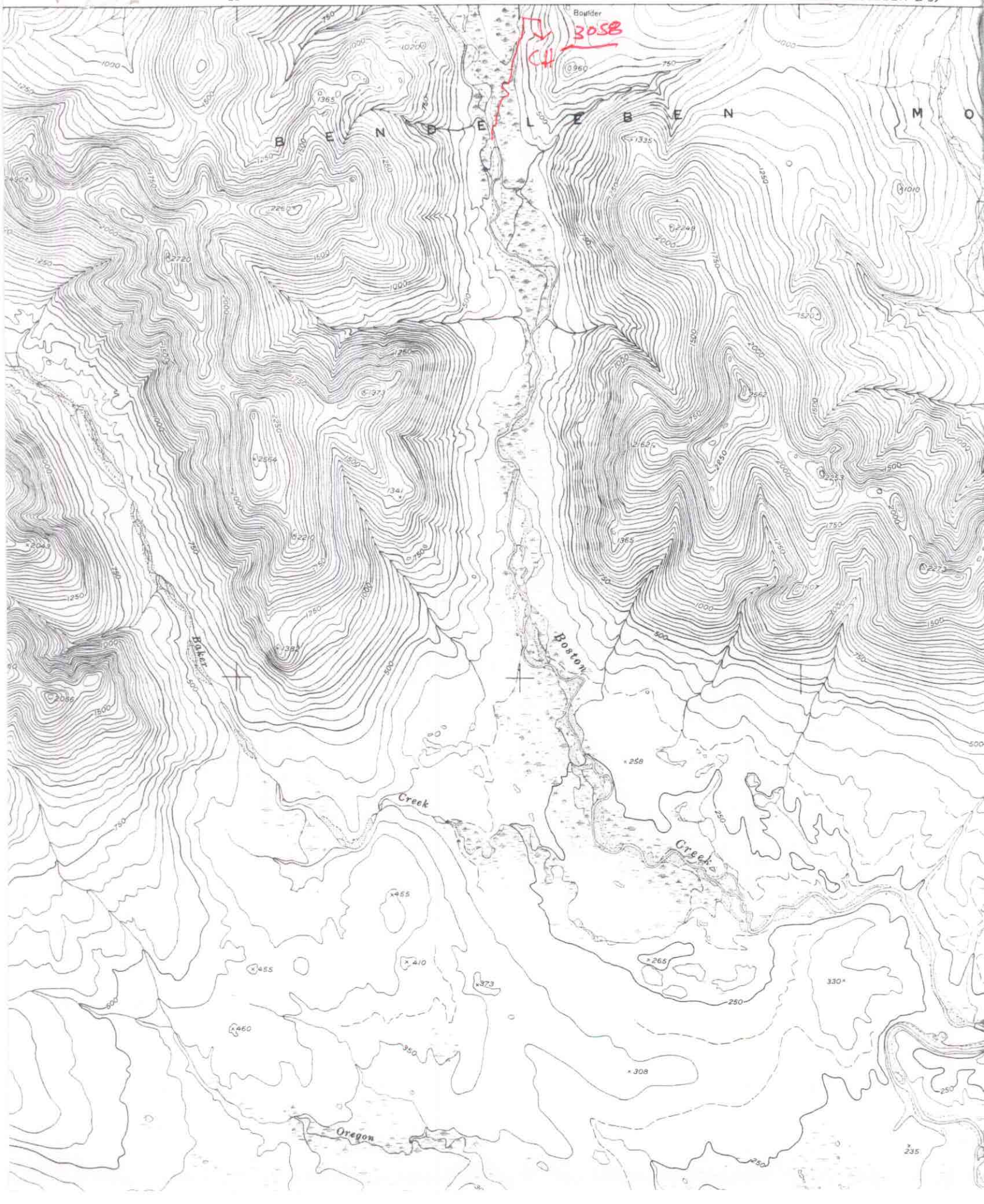
Address: U.S. Bureau of Land Mgt.
Fairbanks, AK

Signature of Area Biologist: [signature]

UNITED STATES
RTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

25' 20' 15' (BENDELEBEN B-3)



FISH RIVER (SEWARD PENINSULA) FISH INVENTORY

by Joe Webb
Fisheries Biologist
Kobuk District
U. S. Bureau of Land Management
Fairbanks, Alaska

Results

Etchepuk River

The Etchepuk River was visited on July 19 and again on July 25, 1986. This tributary enters the Fish River at approximately river mile 36. The length of this stream is about 30 miles of which at least the lower 21 miles is habitat for anadromous fish. The river is a non-braided stream with the current being confined primarily to one channel except for islands and oxbows in the lower areas and some slight braiding occurring in extreme headwater areas. Pink and chum salmon were observed in spawning activity up to Sec. 27, T. 7 S., R. 21 W., Solomon Quadrangle. The stream is about 20 feet wide at this point 20 miles from its mouth. Char and coho salmon fingerlings (1 to 3 inches long) were present and were fairly abundant. Table 1 shows the results of water chemistry and stream flow measurements. The water was moderately hard as evidenced by a total hardness of 102 mg/L and slightly basic (pH 7.1). The flow in these upper reaches measured 24 cubic feet per second (cfs). Substrate was gravel to cobble in the upper reaches and changed to fine gravel and sand in lower reaches. Several thousand salmon were present in the river and most were concentrated in the area between the mouth of Cache Creek and upstream for approximately five air miles. Riparian vegetation consists of white spruce and willow. This stream is apparently used for spawning by pink salmon, chum salmon, coho salmon, and arctic char. Adult grayling were present at the upper sample area. Hook and line sampling on July 25, 1986, in a one-mile area in T. 7 S., R. 21 W., Sec. 16, Solomon (D-2) Quadrangle revealed the presence of grayling primarily in the 11-13 inch (total length) range. A few adult fish over 13 inches were scattered in this area. Figure 2 is a map of the Etchepuk River which notes sample areas and salmon observations at a larger scale than Figure 1.

An observation worth mentioning is the sighting of 10 grizzly bears on this one stream, during the brief time it took to fly upstream from the mouth. There was one, single adult bear, and three sows with two cubs each at scattered locations.

Rathlatulik River

This river was visited on July 19 and 20, 1986. The Rathlatulik enters the Fish River at approximately river mile 38. This stream is about 43 miles long with five tributaries over 10 miles long. The lower river is meandering with many islands and oxbows; a mid-section is relatively straight with a few islands, and much of the upper river is braided. Table 1 gives the results of water chemistry and flow measurements. Figure 3 shows locations of sample areas and includes significant field notes. Approximately the lower 35 miles of the river is habitat for spawning pink and chum salmon. The heaviest concentrations of salmon were distributed from about three miles below Burnt Creek downstream to an area about five miles below the large unnamed tributary which enters from the east. Excellent sport fishing for large (17-21 inch, total length) grayling was located at the area near the mouth of Dry Canyon Creek. Coho salmon fingerlings were collected near the confluence of Rathlatulik River and Burnt Creek. No rearing char were seen and abundance of small fish was very low. The Rathlatulik River is much larger than the Etchepuk River and there were many more salmon in this stream.

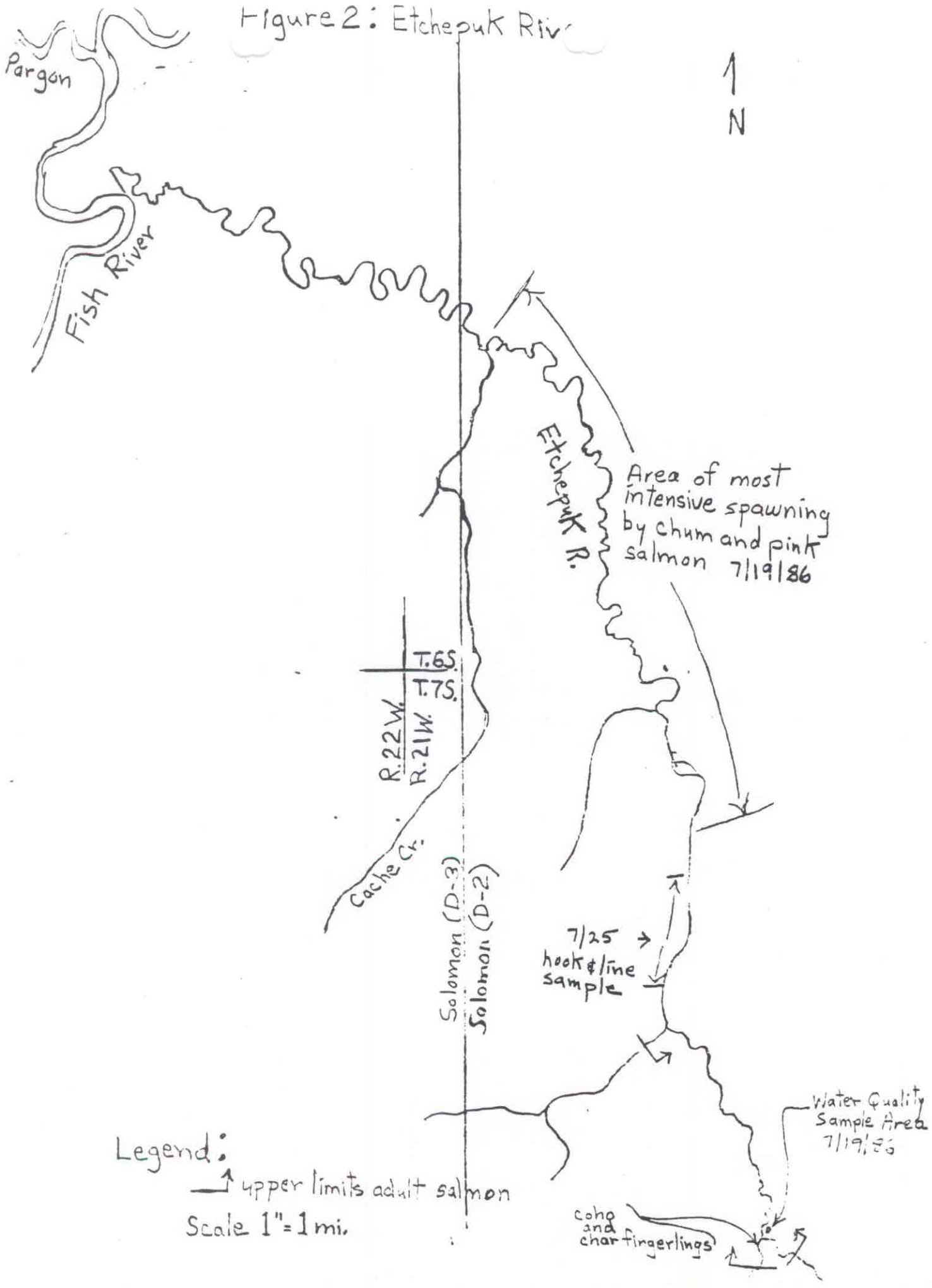


Figure 2: Etchepuk Riv
Pargon
Fish River
N
Etchepuk R.
Area of most intensive spawning by chum and pink salmon 7/19/86
T.6S.
T.7S.
R.22W.
R.21W.
Cache Cr.
Solomon (D-3)
Solomon (D-2)
7/25
hook & line sample
Water Quality Sample Area 7/19/86
coho and char fingerlings
Legend:
upper limits adult salmon
Scale 1" = 1 mi.

Figure 3 A. Lower Rathlatulik River

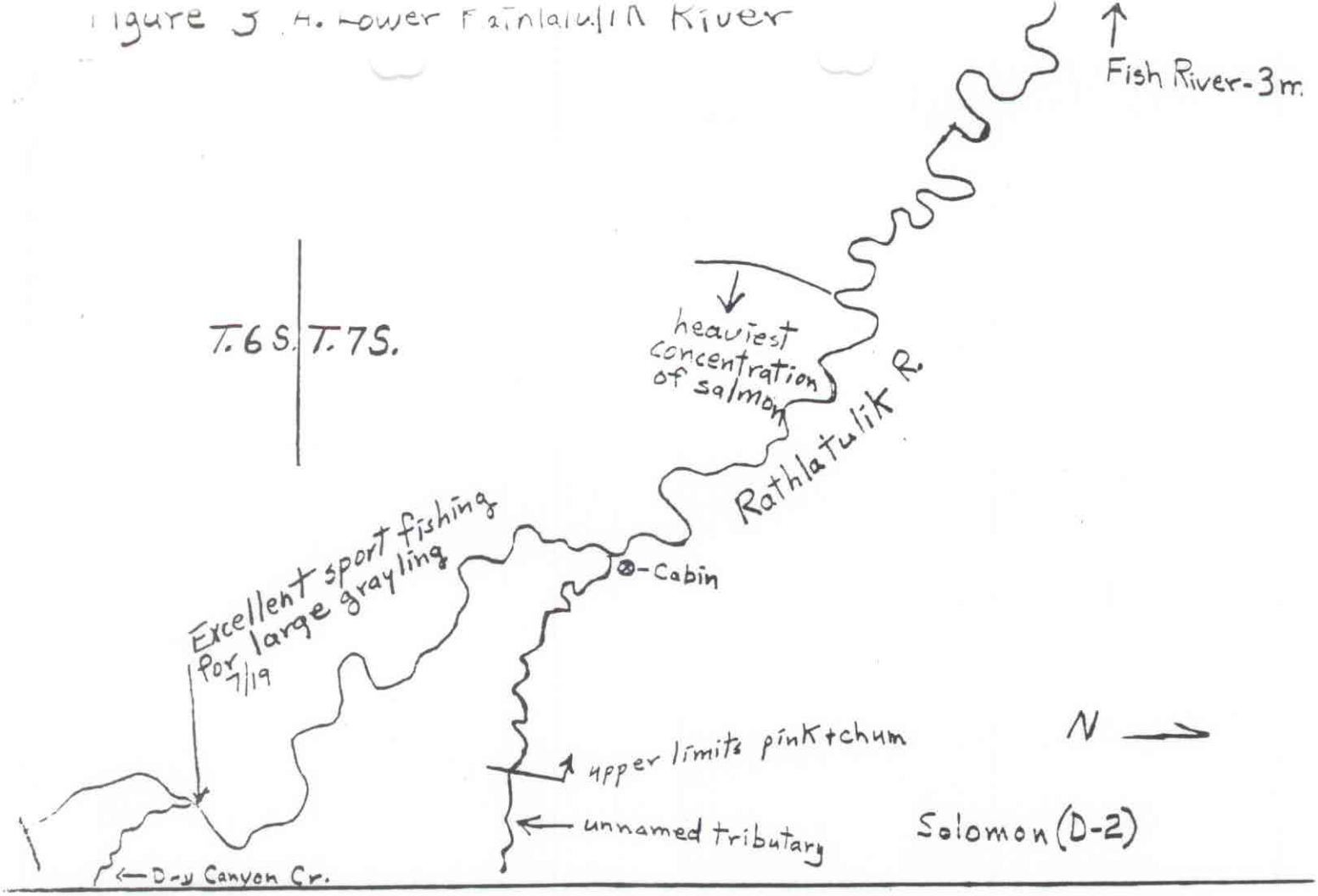
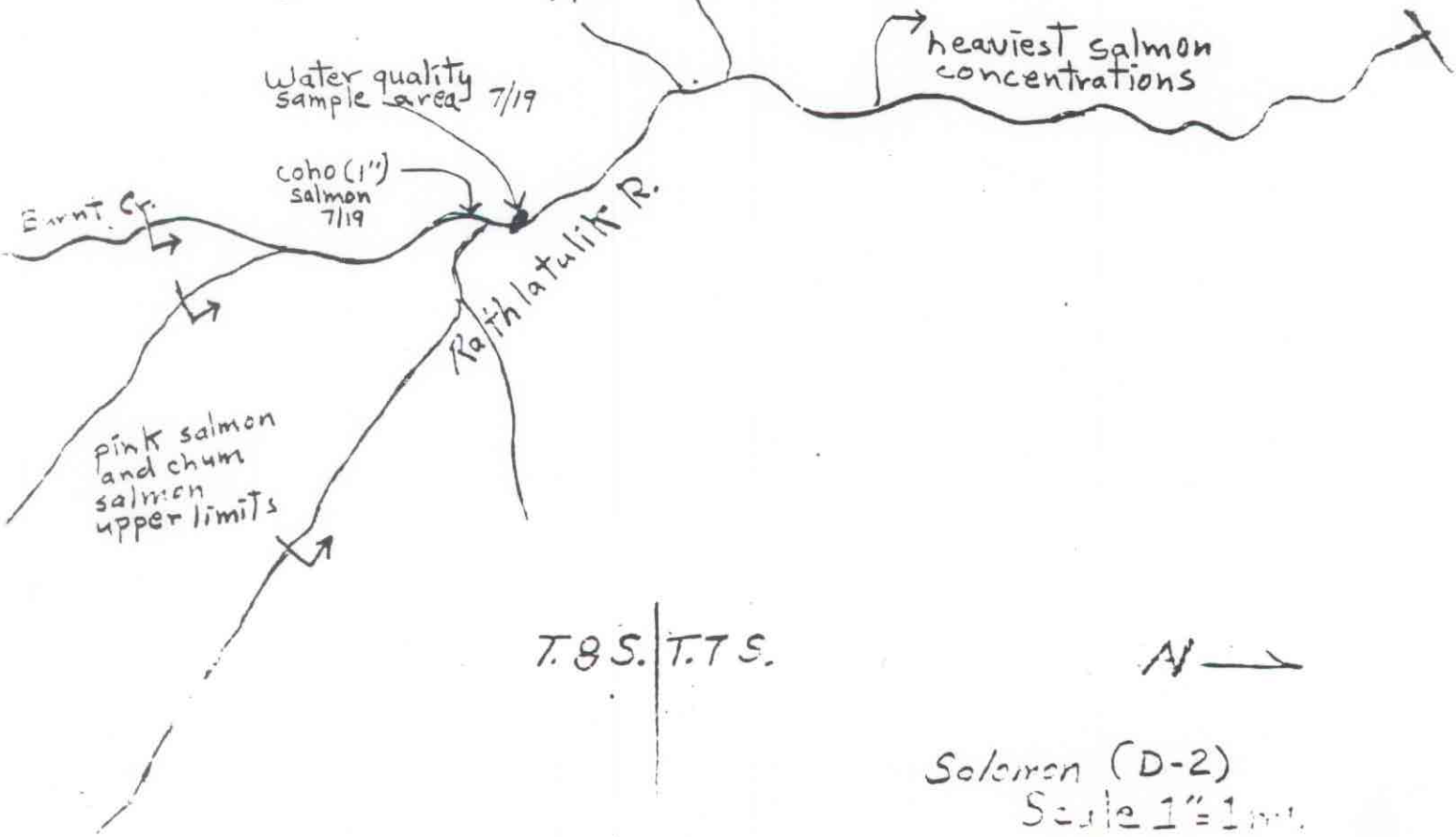


Figure 3 B: Upper Rathlatulik River



Omilak Creek

Omilak Creek was visited on July 20, 1986. This tributary enters Fish River at about river mile 46. This stream is approximately 30 miles in length from the mouth up to the confluence of its two upper forks. The upper forks are each about 10 miles long. Water quality and stream flow measurements were taken on the North Fork and South Fork just above the confluences and the results are shown in Table 1. The total hardness of both forks measured 154 mg/L, which is moderately hard water and significantly harder than water of any other tributary analyzed. The North Fork is a fairly high gradient stream with poor pool development and a gravel to cobble substrate with some boulders. The South Fork is lower gradient and with better pool development in the area near the confluences. Downstream from the confluence the stream substrate is smaller and the gradient is lower and a single channel changes to a braided channel. It is in this area that the upper limits of adult chum and pink salmon were observed. Figure 4 shows the distribution of salmon spawning areas in Omilak Creek A two-mile section of highly braided stream channel is heavily used by salmon, primarily pink in the area the stream flows through Sections 5 and 6, T. 6 S., R. 20 W. Solomon D-2. Three adult grizzly bears were observed feeding in this section. Downstream from the braided area the stream returns to a single, meandering channel and spawning activity gradually diminishes until it stops altogether about three air miles upstream from its mouth. A char (1 1/2 inches, total length) was collected on the North Fork near its confluence with the South Fork, thus indicating the probability that this stream is used by char for spawning. Very few grayling were observed above the salmon spawning area. Large, adult grayling were abundant in the areas where salmon were also abundant.

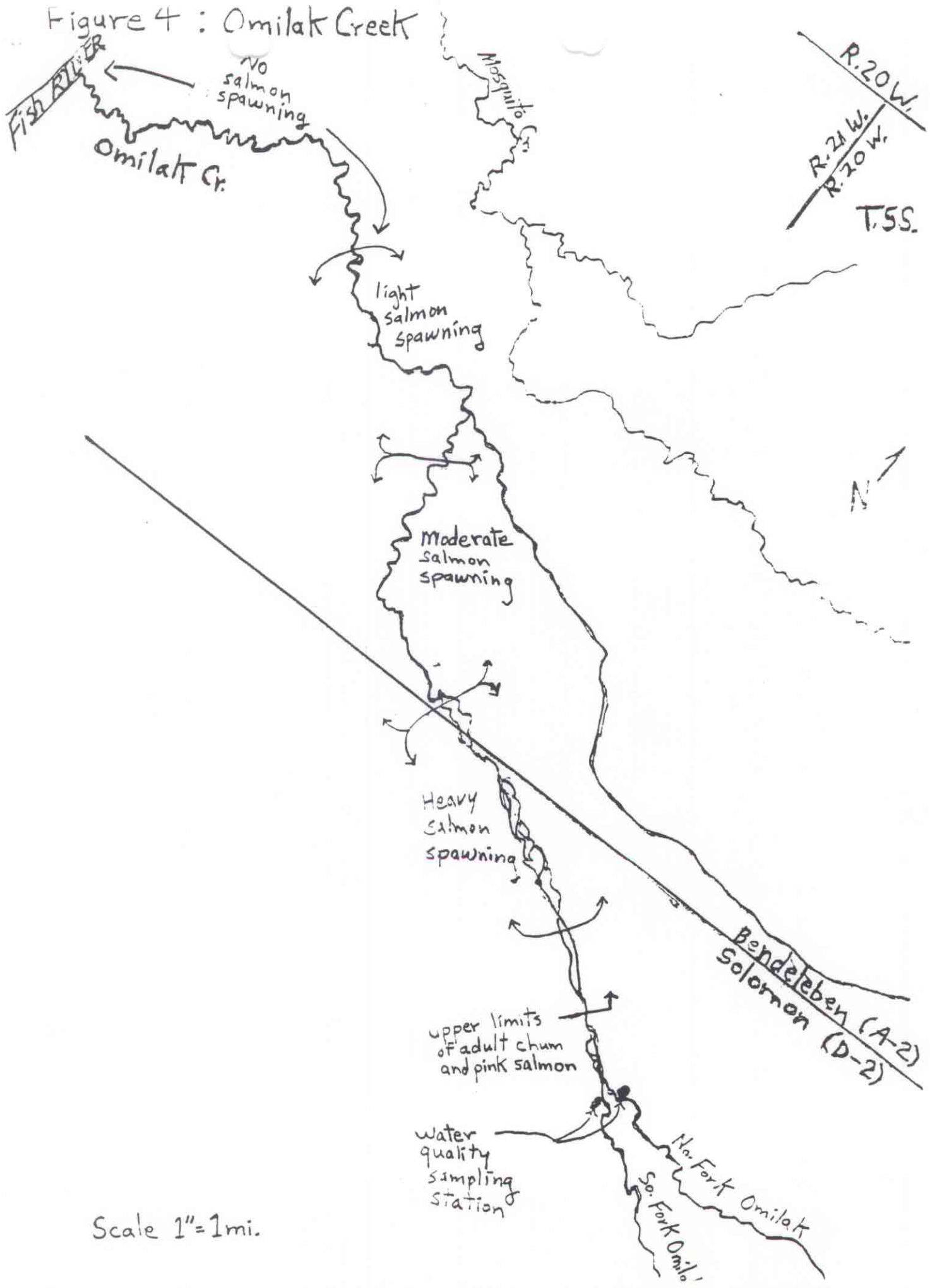
Mosquito Creek

Mosquito Creek, a large tributary of lower Telephone Creek, was flown over on July 20 and again on July 23, 1986. No salmon were observed which is noteworthy in that the other streams this large in the Fish River watershed usually had areas utilized for spawning by pink and chum salmon. The Anadromous Stream Catalog that is published by the ADF&G indicates that both forks of Mosquito Creek contain chinook salmon rearing habitat. A series of large, high beaver dams in the lower section of the stream may be a factor contributing to the lack of salmon observed.

Telephone Creek

Telephone Creek, a tributary of the Fish River at river mile 56, was visited on July 21, 1986. This 20 mile long tributary has three significant tributaries which together with Mosquito Fork, its largest tributary combine to produce a stream flow approximately as large as Fish River above Telephone Creek. Table 1 shows the results of water quality and stream flow measurements. Telephone Creek has extremely soft water when compared to the water in streams such as Etchepuk, Rathlatulik, and Omilak which originate in the Darby Mountains. The sampling station was upstream from Mosquito Creek which flows from the Darby Mountains. The remainder of the watershed forms in the Bendeleben Mountains. For most of its length the mainstem of Telephone Creek is a steep gradient, braided channel stream with a large cobble to boulder substrate. The gradient is reduced below Windy Creek and pool development increases.

Figure 4 : Omilak Creek



A rather large L-shaped lake is located in the Telephone Creek Valley in Sec. 23, T. 3 S., R. 20 W. (Bendeleben A-2). The lake appears to be located on the mainstream and is about 1/3 mile long and up to 1/4 mile wide and fairly shallow. No fish were observed in this lake. This is only worth mentioning because this lake does not show on the USGS map. It did not seem to be a beaver lake. Analysis of high altitude infrared photographs indicated that the lake was caused by a landslide or a otherwise relatively rapid movement of alluvial material from a small side valley/gorge which blocked the stream, thus forming the lake. A new stream channel cut through the deposited material. This likely occurred after 1950 (the year aerial photos were made for the USGS maps).

The upper limits of adult chum salmon were observed approximately one mile below the confluence of Windy Creek. Spawning habitat for pink salmon starts about one mile below that point. Overall, spawning habitat for pink and chum in Telephone Creek appears to be restricted to the portion of the mainstem flowing thorough Sections 2, 3 and 4, of T. 5 S., R. 21 W. (Bendeleben A-2). No adult salmon were observed in any tributary of Telephone Creek. Figure 5 shows where these observations were made.

Adult grayling were distributed upstream from the salmon spawning areas and were observed as far as four miles above Windy Creek. Windy Creek, a high gradient, boulder strewn stream, which is confined to one channel for the most part was observed to contain adult grayling in the lower one mile section. Adult grayling were abundant in the areas where adult salmon were observed and sport fishing for grayling (16 to 20 inches) was excellent in these areas. One small, fingerling-size fish (approximately one inch) was observed in the area where water chemistry was sampled. Intensive visual observation revealed no other young fish. A char was captured by hook and line at the lower sample area noted in Figure 5. The fish was sacrificed to determine sex and gonad condition. It was a female with ova diameters averaging 3 mm which indicates she probably would have spawned in 1986. She had been feeding heavily on salmon eggs.

Lava Creek

Lava Creek, a tributary of the Fish River at river mile 60, was inspected on July 23, 1986. Water quality and flow data is reported in Table 1. Locations of water quality sampling and upper limits of chum and pink salmon adults is shown in Figure 6. The salmon spawning area seems to be confined to the section between the mouth and upstream for a distance of 2 1/2 miles. Several low beaver dams may inhibit upstream migration but do not stop it completely since salmon were observed above the uppermost dam of significance. Stream velocity, substrate, and pool development characteristics appeared to be a major factor determining upstream distribution of pink and chum salmon. These species often prefer gravel substrate in slow to medium velocity streams (less than five feet per second). Upper areas of Lava Creek is characterized by high velocity, large substrate and poor pool development.

The stream flow measurement of 54 cfs is a good estimate for total stream flow since the sample station was downstream from all tributaries. Stream hardness measurements indicate very soft, unproductive water.

Figure 5: Telephone Creek

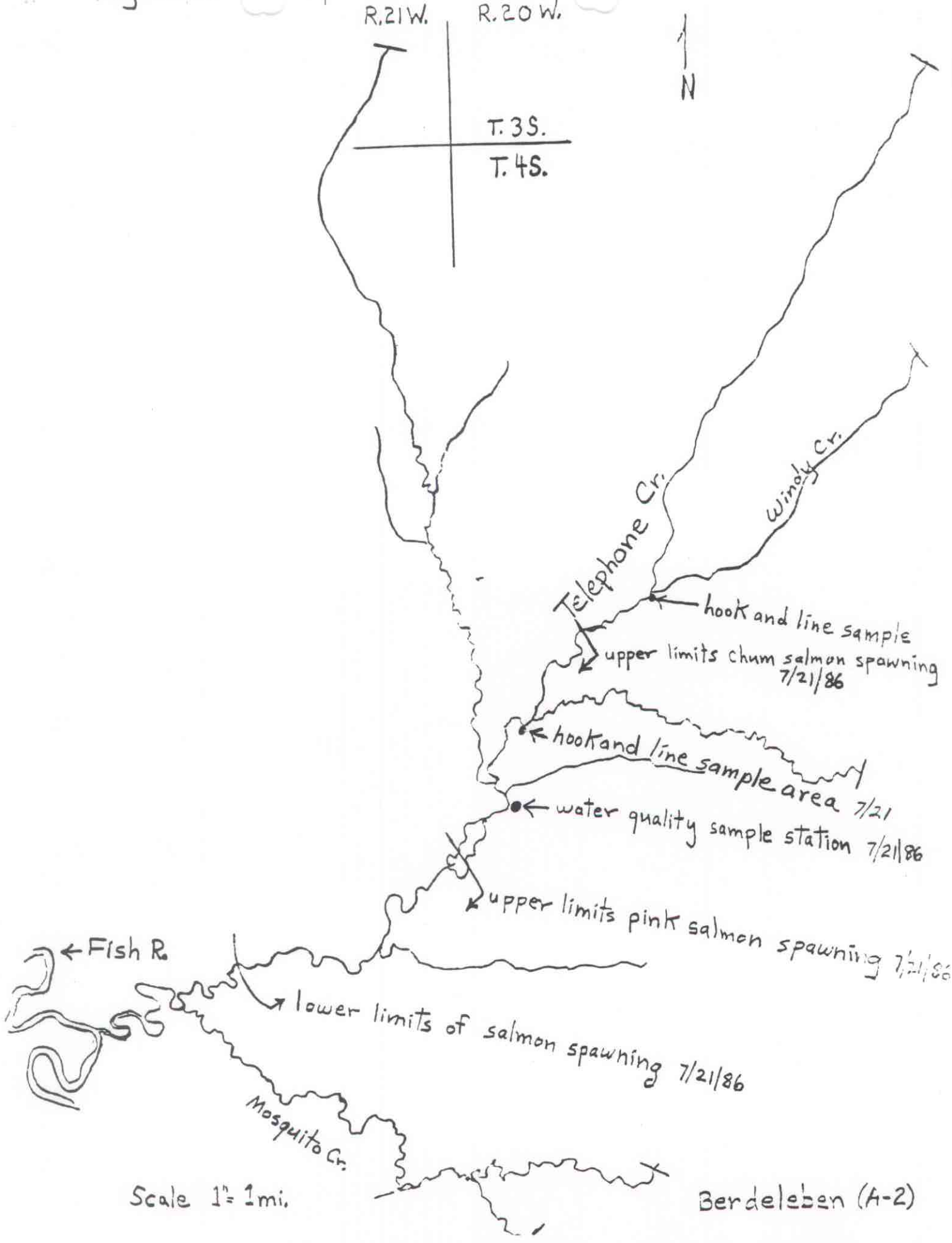
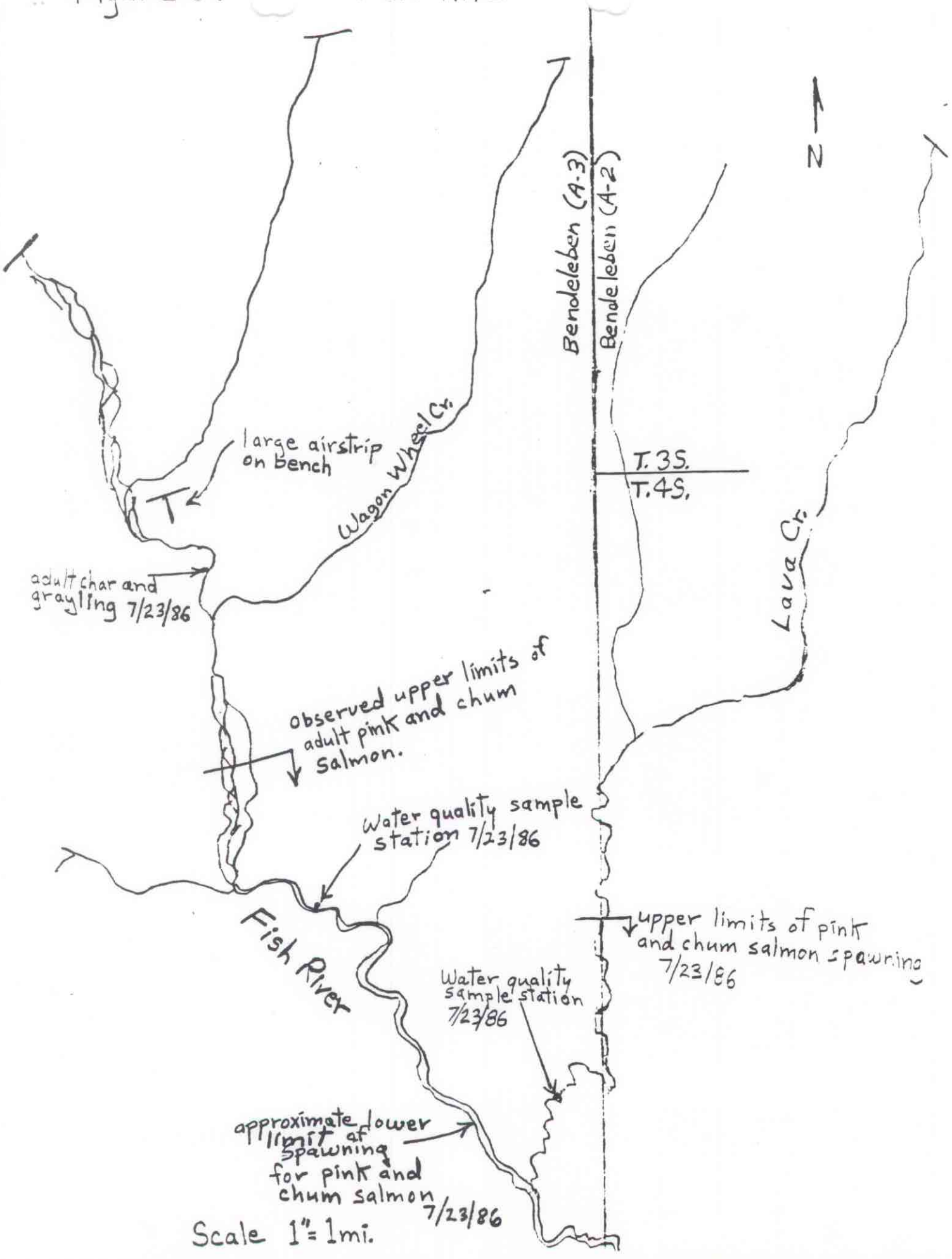


Figure 6: Upper Fish River



Upper Fish River

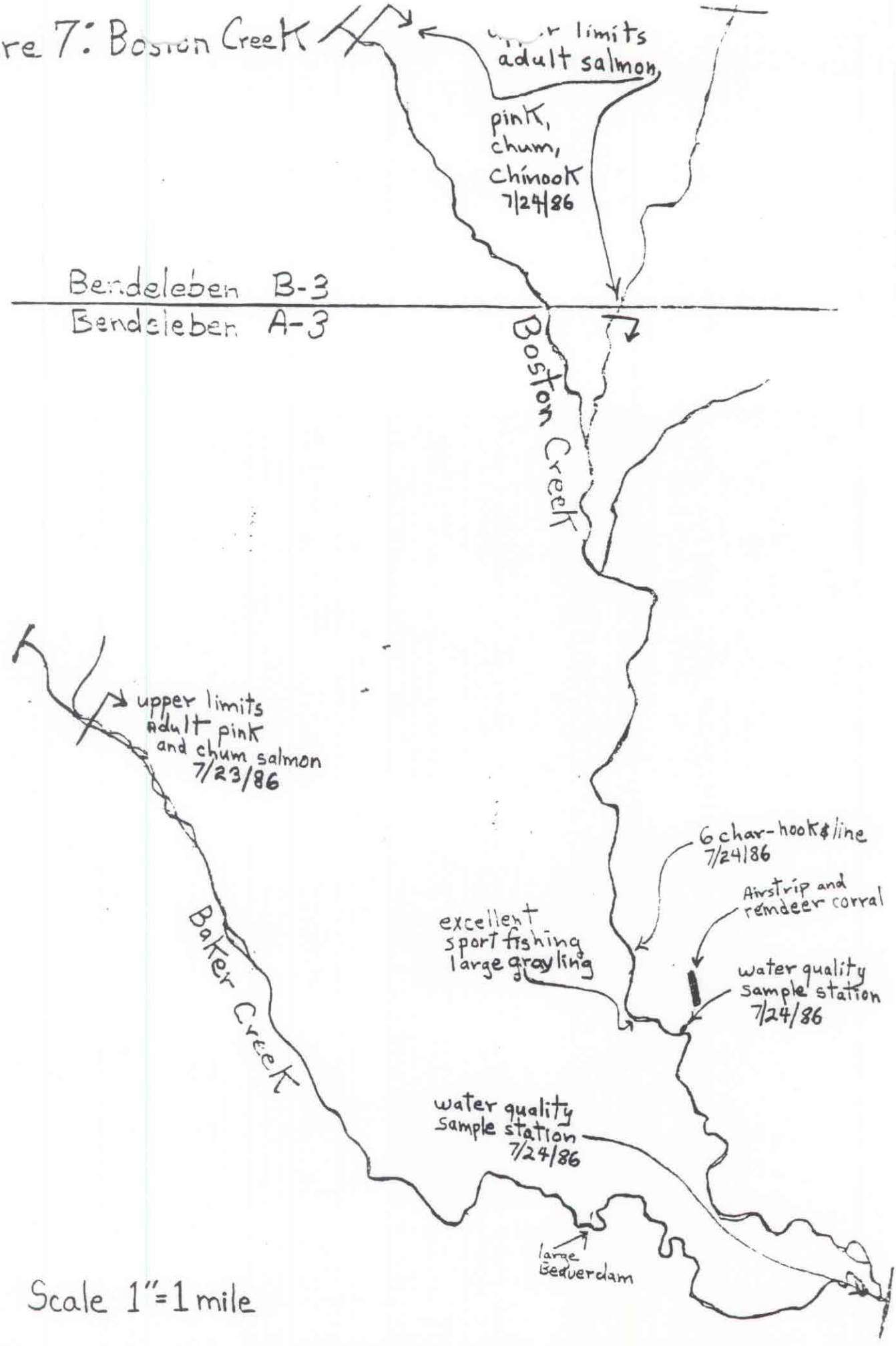
Fish River was inspected by air on July 23, 1986, to determine the upper limits of distribution of adult salmon. Pink and chum salmon were observed spawning as far upstream as river mile 65, about 5 miles upstream from the mouth of Lava Creek. Adult char and grayling were captured by hook and line at a point 1.5 miles above the uppermost sighting of salmon. Spawning activity was not observed downstream from river mile 61 (about one mile above confluence of Lava Creek). Spawning habitat for pinks and chums may be restricted to this four mile segment due to physical habitat requirements. Upstream, much of Fish River is a high velocity braided stream with poor pool development and cobble to boulder substrate in many areas. Downstream, the section of the river flowing thorough McCarthy's Marsh is very slow and meandering with a sand to small gravel substrate and poor riffle development. A malfunctioning backpack shocker prevented sampling for fingerling char and coho in upper areas. Spawning habitat may occur below McCarthy's Marsh but this area was not investigated. The results of water quality sampling are shown in Table 1. Water is soft (total hardness 68 mg/L) and slightly alkaline (pH 7.1). Figure 6 shows the locations of spawning areas and the water quality sample site for upper Fish River as well as Lava Creek.

Boston Creek and Baker Creek

Boston Creek was visited on July 23 and 24, 1986. Boston Creek enters Fish River at about river mile 45 and is the second largest tributary after the Niukluk River. Spawning salmon were observed from 1/4 mile above the mouth upstream to the upper headwaters. Suitable habitat for chinook, chum, and pink salmon stretches for about 45 river miles. Baker Creek, a major tributary has spawning pinks and chum salmon but apparently no chinook. An unnamed tributary which enters about nine stream miles above Baker Creek contained chum salmon. Oregon Creek a major tributary below Baker Creek was closely examined but no salmon were observed. Adult char were captured by hook and line at three locations along Boston Creek but they were not abundant. Sampling for fingerling fish was not attempted. Water quality data for Boston and Baker Creek is recorded in Table 1. Boston Creek has the hardness water of all the streams originating in the Bendeleben Mountains that were checked. Hardness and alkalinity was more like that of streams originating in the Darby Mountains.

Figure 7 shows the upper limits of adult salmon distribution and the location of water quality sample stations for Boston and Baker Creeks. Only that portion of Boston Creek from Baker Creek and upstream for approximately 13 miles is shown. As mentioned earlier, practically the entire length of Boston Creek is apparently used for spawning by chinooks, pinks, or chums. (Actually, spawning habitat is discontinuous but is located throughout the stream except for extreme upper headwaters.) Adult salmon were observed farther upstream and closer to headwater origins than for any stream in the Fish River system including the main stem Fish River and the Niukluk River. More salmon were observed in Boston Creek than in any other area within the Fish River watershed.

Figure 7: Boston Creek



Pargon River

The Pargon River is a western tributary of the Fish River and enters at river mile 38. A cursory examination of this stream was conducted on July 24, 1986, when one overflight was made to determine upper limits of adult salmon. Approximately, the lower 20-mile segment contains habitat for spawning chinook, chum, and pink salmon. Chum salmon were noted at the lower end of a highly braided stream segment in Sec. 28, T. 4 S., R. 24 W., (Bendeleben A-4) just as the stream leaves the Bendeleben Mountains. Chums, pinks, and chinook salmon were distributed very discontinuously downstream to the mouth. Pink salmon were scarce compared to other spawning streams. This phenomenon is probably related to overall habitat quality as the Pargon River has a substrate composed of a higher proportion of large angular rocks and boulders compared to other streams in the area. Water quality and stream flow measurements were not made and the stream was not visited on the ground.

Summary Discussion and Recommendations

The Fish River and its tributaries provides excellent habitat for thirteen species of fish including all pacific salmon species except for sockeye. The salmon, are significant to regional commercial and subsistence fisheries and a growing sport fishery.

Overall, sport fishing quality is outstanding in many areas for chum and pink salmon and exceptionally large arctic grayling as well as char. Boston Creek is the highest quality sport fishing stream in the system due to the great number and variety of fish present and the fact that it also has chinook salmon, a highly prized sport fish. The area is relatively accessible by road from Nome then by boat from Council or by fixed-wing aircraft.

The area may provide abundant habitat for coho salmon and char but a malfunctioning electrofishing unit caused data from this aspect of the inventory to be incomplete. Habitat for these species may be plentiful, particularly in the Darby Mountains' streams.

Generally, the Darby Mountains' streams had water that measured higher for total hardness and alkalinity. These factors are general indicators of relatively higher productivity because harder water streams are usually biologically more productive than soft water streams (if other considerations are approximately equal). Boston Creek, originating in the Bendeleben Mountains had water quality similar to the Darby streams.

Spawning habitat for salmon in interior and northern Alaska is often limited by winter water availability for incubating eggs and for fry after hatching. Apparently, the winter water supply is satisfactory in most major tributaries of the Fish River due to the widespread spawning observed. In the streams which contained spawning pink and chum salmon the upper and lower limits of spawning appeared to be constrained by substrate and velocity factors. There is no explanation for the apparent limiting of chinook spawning to Boston Creek and Pargon River. There were at least three streams which appeared to contain some physical habitat suitable for chum and pink spawning in which no

salmon were observed. These streams are: Dry Canyon Creek, a Rathlatulik River tributary; Mosquito Creek, a Telephone Creek tributary; and Oregon Creek, a Boston Creek tributary. It is not known for sure what is preventing chums and pinks from using these streams but observations suggest that barriers may be responsible. Mosquito Creek has a series of rather large beaver dams in its lower reaches. In the case of Dry Canyon and Oregon Creeks, their mouths appear to be on a bedrock bench perched above the bottom of their receiving streams. This may cause depth and/or velocity barriers to exist; however, this is fairly speculative at this time.

The following recommendations are made based on the findings of this inventory:

1) Conduct inventories of char and coho salmon spawning habitat particularly in the streams originating in the Darby Mountains.
2) Inventory the amount of potential physical spawning habitat available for pink and chum salmon spawning in Oregon, Mosquito, and Dry Canyon Creeks.
3) Determine those factors limiting use of potential spawning habitat for pink and chum salmon in Oregon, Mosquito, and Dry Canyon Creeks.
4) Inventory, map, and publicize available access to the Fish River area to enhance sport fishing opportunity and use.
5) Monitor fishing and hunting use of those BLM lands in the Fish River area, including the commercial recreational use of the area.