2113

ST. MARY RIVER

ACKNOWLEDGEMENTS

I would like to thank the secretarial staff of the Fish and Wildlife Branch, and the many other people who helped provide background data and equipment to make this project possible.

In particular I would like to thank R.A. Seaton (Conservation Officer) for his invaluable assistance throughout the field survey. Mr. Seaton's unlimited knowledge of the area was of tremendous help to the survey crew throughout the study period.

Table of Contents

List of Photographs

List of Tables

St. Mary River Project

1973

INTRODUCTION

Logging road access development has rapidly increased in the East Kootenays since the Crestbrook pulp mill started operations in 1968. Stream fisheries previously inaccessible except by foot have been rapidly opened to vehicular access and consequently intensive fishing pressure on some systems may be creating management problems.

Problems of increased access, limited knowledge of Yellowstone cutthroat trout (Salmo clarkii lewisi) and imminent logging in various drainages prompted this study. Initial work was conducted on three tributaries of the St. Mary River system.

The St. Mary's watershed originates in the Purcell mountain range. Several major tributaries flow from the mountains in a south and east direction to form the main St. Mary River some twenty miles west of the city of Kimberley. The St. Mary River flows east and enters the Kootenay River near Fort Steele. The valleys of the St. Mary's drainage contain a variety of magnificent features such as glaciers, alpine meadows and rocky spines. They support a wide variety of wildlife and excellent stream fisheries. Forest cover in these valleys range from high yield forest types in the valley bottoms to low yield forests in the headwaters.

Three major tributaries of the St. Mary's drainage were examined in detail. White (East fork) Creek, Dewar Creek and West Fork were surveyed for fish distribution and relative abundance,

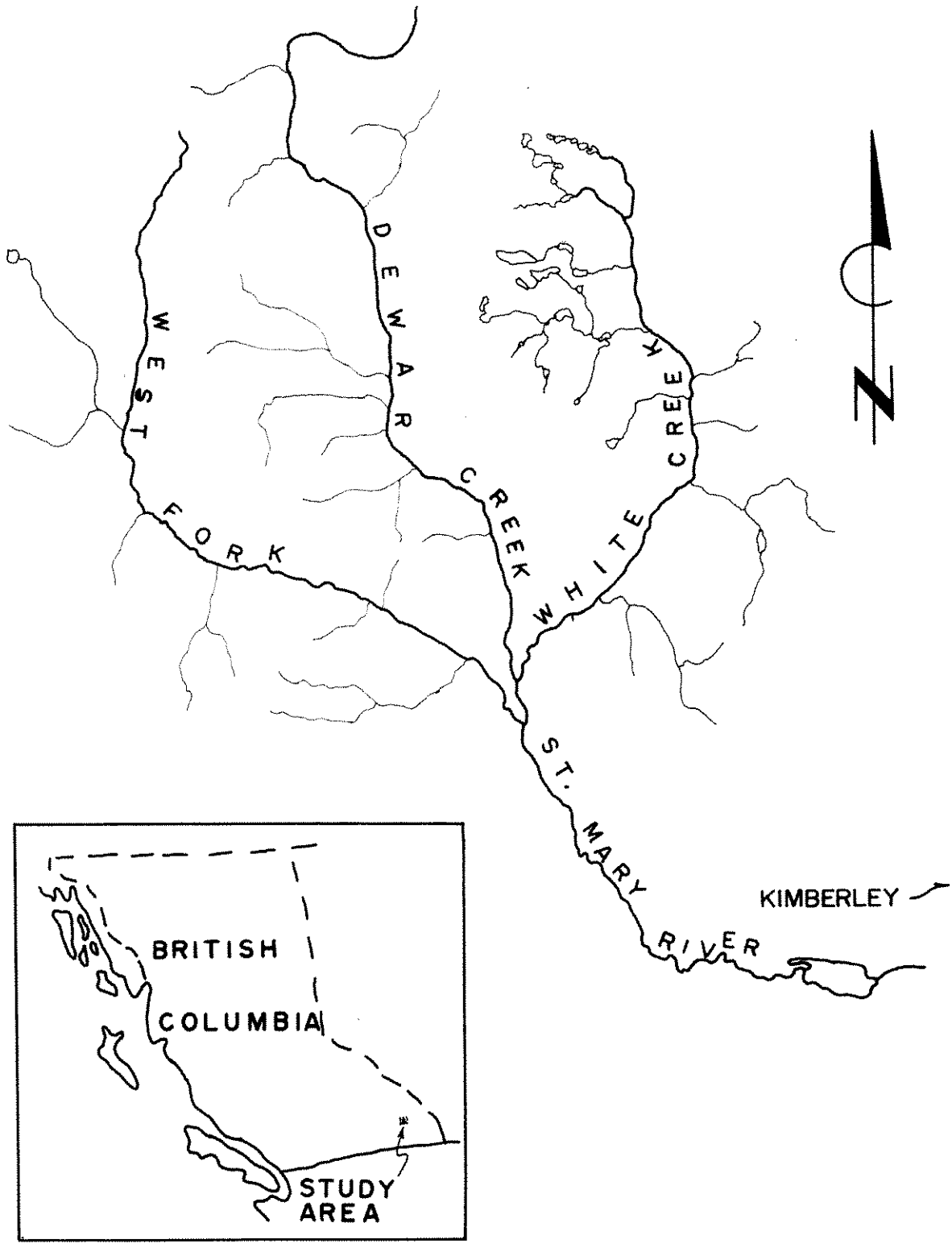


FIGURE 1. LOCATION MAP OF STUDY AREA

angler use, and location of spawning habitat. Subjective appraisals of stream gradient, substrate, recreational use, access and aesthetic amenities were also made.

METHODS

Essentially this study consisted of stream survey work and creel census. Most of the field work was conducted during July-September of 1973.

Stream survey work consisted of each tributary stream being walked from its confluence with the main stream for a distance of up to three miles dependent upon terrain and ease of access. Attempts were made to record fish species present either by using electroshocking equipment, angling, fish traps or gill nets. Substrate characteristics, stream gradient, turbidity and obstructions were also recorded. Visual observations were made on spawning habitat and/or spawning fish. Representative photographs of various stream sections were also taken.

Access was provided by use of a four-wheel drive, rubber raft and scuba gear.

Creel census days were scheduled for West Fork and Dewar Creeks. White Creek was also scheduled but on different days than those for West Fork and Dewar Creeks. One Saturday, two Sundays, one Monday and two weekdays were checked each month. Intent of the census was to obtain from the angler the total number of hours fished per day and subsequent catch. In addition, information was collected on the location of catch, residence of angler, length, weight and scale of fish caught.

RESULTS

A. White Creek

White Creek supports a population of resident Yellowstone cutthroat (Salmo clarkii lewisi) and Dolly Varden (Salvelinus malma). The numbers and size of the cutthroat trout are sufficient to produce a high quality sport fishery. At certain times this fishery could be rated as one of the best dry fly sport fisheries available to East Kootenay sportsmen. High quality scenery and excellent stream fishing concomitant with a number of suitable sights for camping has resulted in heavy recreational use.

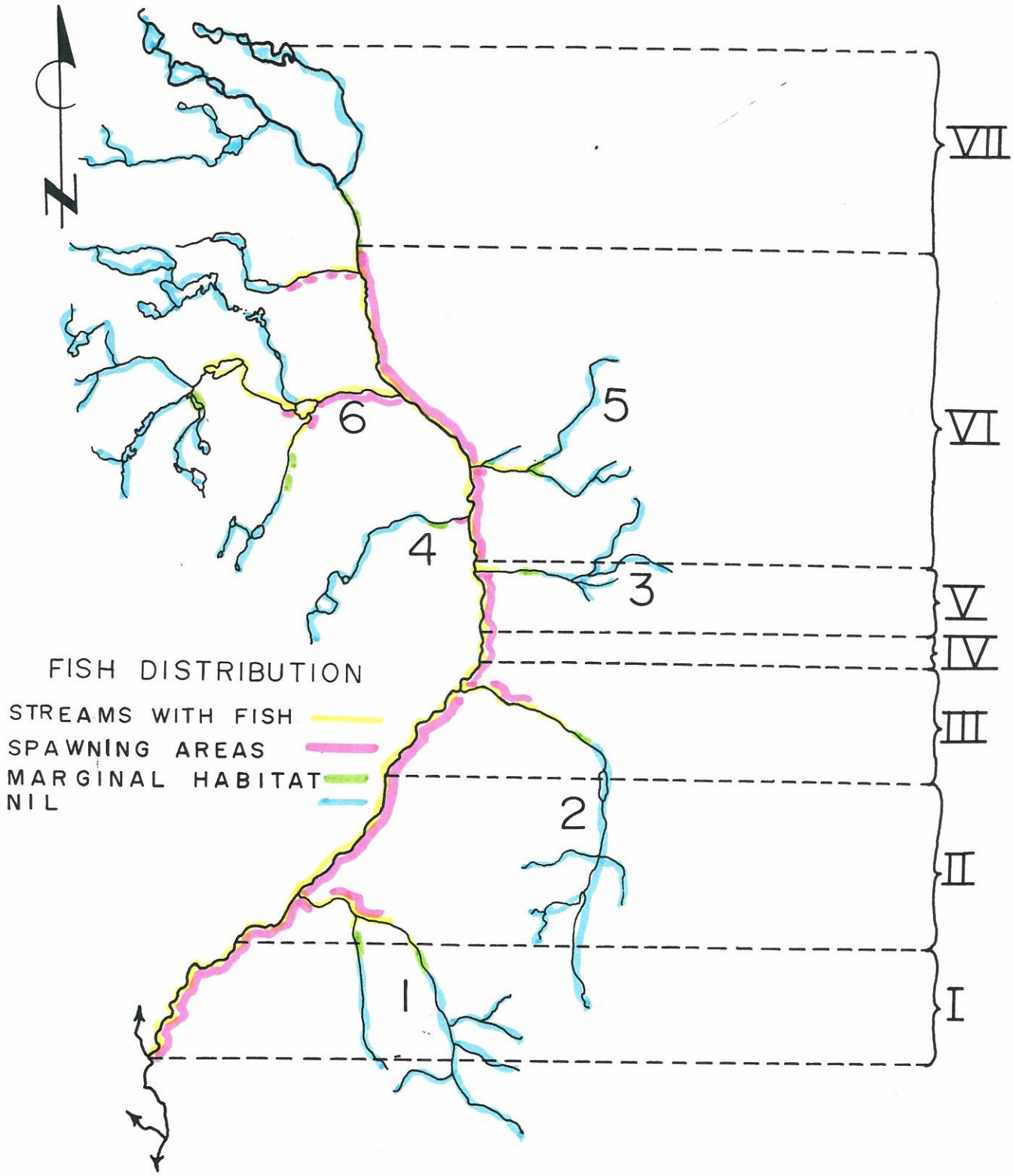
White Creek is mainly fed by glacial lakes such as Spade (Parachute), Price, Hodgson, Nowitka, Layallii, Canning, Phyllodoce, Bleak and Totem, all of these being within the St. Mary's Alpine Park. The headwaters of this valley are attractive and populated by numerous small cutthroat trout and Dolly Varden as well as a variety of wildlife. Spade Lake is the only lake with a native population of fish. The remaining lakes appear to be too high in elevation to support adequate food sources to maintain a healthy fishery.

The valley bottom is U-shaped with a maximum width of one-half mile. Most tributary streams are steep dominated by large boulders from headwaters to where they enter the main valley bottom.

GENERAL DESCRIPTION OF WHITE CREEK

Section I

The first 2.5 miles of White Creek upstream of its confluence with Dewar Creek is fast flowing and meandering with a


N
VII
VI
V
IV
III
II
I
1
2
3
4
5
6
FISH DISTRIBUTION
STREAMS WITH FISH
SPAWNING AREAS
MARGINAL HABITAT
NIL

WHITE CREEK

gradient of about 1.3 percent. Substrate consists generally of large boulders and gravel with numerous suitable spawning sites throughout. This section of stream provides excellent sport fishing conditions with 40:60 pool/riffle ratio and gravel beaches for easy casting and walking. Fishing pressure in some areas was heavy because of easy access. Angling success was best just after the forest closure, August 21, 1973.

Size of fish generally found in an anglers creek was between 6 - 16" for cutthroat trout and up to 22" (4 lbs.) for Dolly Varden. Success[1] of anglers varied throughout the study period. It ranged from 1.75 fish per hour in July to 0.3 fish per hour in September. Personal success of the author was as high as ten plus fish per hour, but this diminished to 0.2 fish per hour after intensive fishing pressure had extended into rather inaccessible areas.

No barriers to fish are located in this section of the stream. Minimum flow during the study period was approximately 200 c.f.s. Due to a burn which occurred approximately ten to fifteen years ago the stream banks are not held together by large conifers, thus resulting in an unstable stream bank and relatively poor stream bank cover. Cover consists mainly of scrub alder, immature larch, spruce and white pine.

Section II

The next 3.25 miles has an estimated gradient of two percent. Substrate is mainly bedrock and boulder with some gravel present in the pools. This section has a number of small falls

[1]Success is the ratio determined by dividing number of fish by the number of hours fished.

and stretches of stream that have predominently bedrock substrate. Some of the falls could be barriers to upstream migration of small cutthroat trout. Spawning habitat is limited to patches of gravel and sand found in pools.

This section of stream is fairly inaccessible, separated from the road by immature larch, spruce and white pine. Stream banks have not been entirely affected by forest fire and are relatively stable with mature stands of cedar in several places. Stream bank cover is very good with overhanging alder which provides excellent shade canopy.

Angling is more difficult in this area and fishing effort was low. Success varied from a high of ten fish per hour during the forest closure to a low of only 0.3 fish per hour after being exploited by hardy anglers who were forced to fish these areas because of fishing competition in the more accessible areas. The change in success also reflects what happens when access is provided; ie. bridge repair allowed better access late in the summer.

Section III

This section of the stream is approximately 2.5 miles long and has a gradient of about 2.3 percent. Sections of this portion of the stream are relatively flat and meandering with several old log jams and beaver ponds evident. Downstream from the confluence of Boulder Creek (tributary 2) the stream is broken up into numerous side channels which are suitable rearing areas

for young fish. Fishing pressure in accessible areas was heavy, with success ranging from good to poor after heavy pressure in late August and early September. The substrate in this section is mainly gravel and sand with some bedrock and boulder. This section contains abundant spawning habitat throughout.

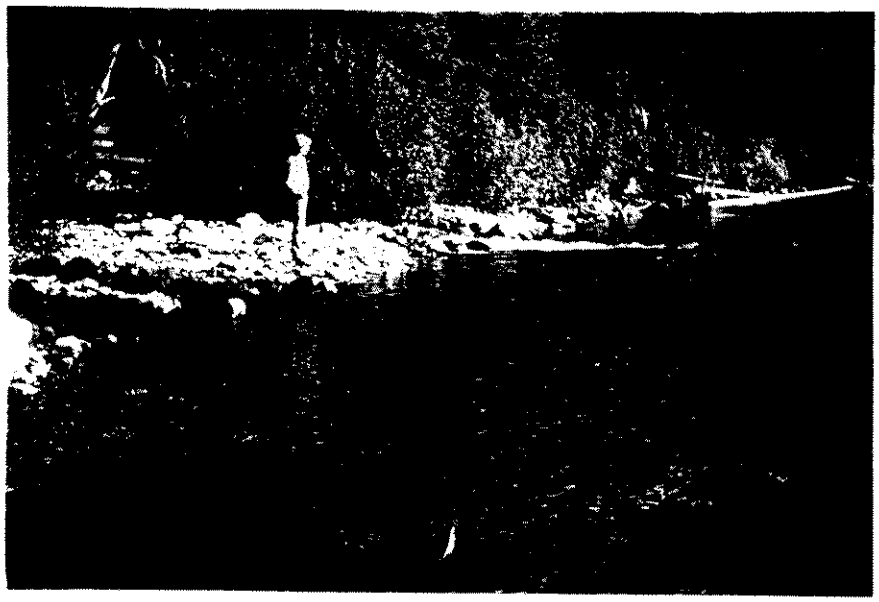
Previous logging in this area has left few mature trees and has resulted in numerous log jams and eroded stream banks. It appears that the stream has rehabilitated itself to the point where log jams have created favourable habitat and good cover. Streamside vegetation is mainly scrub alder and the forest cover is immature larch, alder, cedar.

Section IV

This portion of the stream, known as the beaver ponds, has an average gradient of 0.9 percent. Sections of this area are dammed thus forming ponds suitable for small boats. Bottom substrate varied from fine gravel to sand and mud. Fish habitat is excellent with suitable cover and adequate food sources to support a good population of fish. Spawning and rearing capacity in this section is probably the most prolific compared to other stream sections surveyed.

The stream flows slowly and meanders through cedar swamp habitat. Pools are up to ten feet deep with undercut banks and several snags along the shoreline. Previous logging has left numerous stumps and stream banks are still unstable.

Angling pressure in this section was heavier than any other area in the valley. Easy road access to suitable camping



Section III - Confluence of Boulder Creek. Note the depth of pool and shade produced by stream bank cover.

Electrofishing Boulder Creek (Tributary 2 of White Creek).

sites and good quality fishing complemented this area. Fishing success was rated as good to excellent in early summer (July) and for a short time after the forest closure (last week in August). However, angler success and number of fish caught dropped substantially in September. For example, one family of four in July angled fifty-two cutthroat in one and one-half days fishing, but late in September angling produced very few fish - three fish in two hours angling. The size of fish present early in the year ranged from 5 - 15", but after excessive angling pressure the maximum size was only approximately 8 - 9 inches. There was a definite decrease in the angling pressure as the number of fish decreased.

Section V

This section of White Creek has an average gradient of 2.3 percent. The substrate varies from large boulders to fine gravel and sand. There is suitable spawning gravel throughout. The stream bank vegetation is thick scrub alder with limited forest cover due to previous logging. There are also many log jams and pools with good fishing throughout. Angling pressure was not excessive but heavy enough to affect angling success.

Section VI

This five mile stretch of river has a gradient of 1.1 percent (estimate), but some sections of the stream have almost zero gradient. Substrate was gravel, sand and boulders with some sand. In early July fishing was good with most fish in spawning condition. Indications are that this area is probably the most

valuable spawning area in the entire stream.

Electrofishing in September in side channels produced numerous juvenile cutthroat trout and Dolly Varden. Angling in July produced thirty cutthroat trout in three hours. Fish caught ranged in size from 5" to 14". There were a few large Dolly Varden observed in this section of the stream, but these fish were difficult to catch and none were collected. Angling pressure was light in this area particularly in the upper portions because of the small size of the stream and road access problems.

Section VII

This headwater section was not investigated due to extremely steep terrain. The gradient is 21% (estimate), with numerous falls indicated on the map. Substrate is probably bedrock and boulder with limited fish habitat.

Tributary 1

Burnt Creek is a small precipitous tributary stream which flows west and joins White Creek 3½ miles upstream from its confluence with Dewar Creek. A bridge crosses the stream approximately one mile above the confluence with White Creek. Upstream of the bridge the stream is very steep and fish habitat soon becomes marginal. Electrofishing immediately above the bridge revealed a population of Dolly Varden with an average length of 8" - no cutthroat were found. Downstream from the bridge no fish were found, due possibly to the eroded stream banks, braided unstable conditions caused by previous logging and/or a fire that occurred in this area. The stream is blocked by extensive log jams.

Burnt Creek (Tributary 1 of White Creek) - Note the unstable stream banks and washouts.

Open stream banks and eroded stream banks on Burnt Creek

Boulder Creek (Tributary 2 of White Creek) - Collecting samples of fish.

Fish collected by electrofishing on White Creek.

Where the stream is braided and altered, bank cover is limited. At one point there is an eroded gravel bank twenty feet high and one-hundred feet long.

Stream flow was about 40 c.f.s. and width fifteen feet. Substrate is composed of large boulders and bedrock above the bridge and boulder-gravel below bridge to the confluence. Gradient is very steep with more than ninety percent riffle and few pools. Spawning potential in this stream is marginal.

Tributary 2 (Boulder Creek)

This tributary drains a small alpine lake on the east side of White Creek. It enters White Creek 8.5 miles from its confluence with Dewar Creek. Substrate consists mainly of large boulders, bedrock and some gravel. The streamside cover is scrub alder and other small deciduous trees. Due to previous logging the stream is channelized and has numerous log jam barriers. The lake source provides a clear discharge measured at about 60 c.f.s.

The amount of good spawning gravel is limited. This stream, like most tributaries in this valley, is very steep in the headwaters. The short section of stream with moderate gradient near the confluence with White Creek supports some cutthroat trout. In this area numerous pockets of holding water were observed behind large boulders and electrofishing produced cutthroat trout up to eight inches in length. The average fish in this stream was 6½ inches.

No angling was observed in this stream. Local anglers claimed that fishing used to be good.

Tributary 3

This creek is only three to four feet wide with a flow of 1 c.f.s. (estimate). There is some suitable spawning habitat in the lower reaches (about 200 yards) and it appears suitable for rearing small fish. However, most of the bottom is boulder and rubble substrate. It flows through a swampy area and is full of debris from past logging and natural bank sluffing.

Tributary 4

This stream was not investigated as it appeared to be too steep for suitable fish production. The exception would be at the very lower section close to its confluence with White Creek.

Tributary 5

This small tributary is similar to number three but it dried up during late August. It could possibly contribute a silt load to the main stream during high water.

Tributary 6 (Spade Creek)

Spade Creek drains Spade (Parachute) Lake on the west side of White Creek. Estimated flow was about 40 c.f.s. It has a steep gradient and a large boulder substrate, with patches of gravel throughout. Electrofishing produced fifteen fish in a 200 yard stretch of stream (Dolly Varden and cutthroat). Average length of these fish was five inches with maximum length of only seven inches. This stream appears to be a good rearing and spawning area. Numerous small falls and log jams throughout the stream create barriers to migratory fish. However, it appears that

resident fish are distributed throughout the stream. Stream bank cover is mostly deciduous scrub alder while the forest cover is mature fir and cedar.

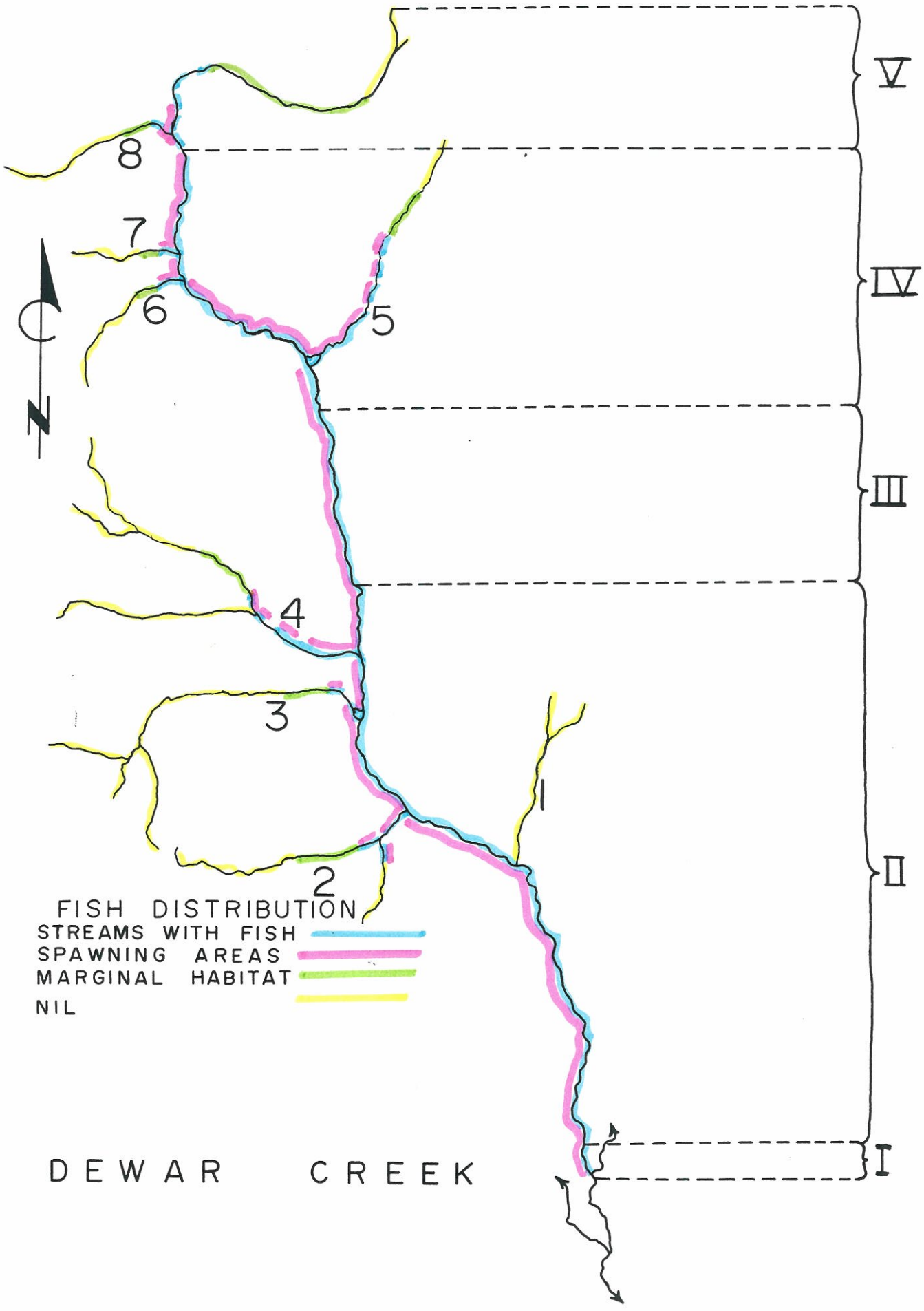
Spade Lake is a popular fishing and camping area with excellent dry fly fishing for small cutthroat to fourteen inches. This lake also has numerous large Dolly Varden reportedly up to five pounds.

B. Dewar Creek

Dewar Creek is populated with Yellowstone cutthroat, Dolly Varden, Rocky Mountain whitefish and sculpins. Sport fishing on this stream is significant, but not as intensive as White Creek. Active logging operations and restricted access to the river presently limit the number of anglers. Quality fishing in this stream is available with many cutthroat reaching sixteen inches in length. Fish were not abundant and this is probably a direct result of the limited number of holding pools. It is unlikely that intensive fishing pressure can be sustained on Dewar Creek.

Success of anglers fishing Dewar Creek was directly related to how ambitious they were. That is, if an angler spent the time to walk to suitable holding water, chances were that limit catches could be attained. However, the casual angler fishing only at the roadside spots would catch very few fish. Success did not vary to the same degree as White Creek.

Dewar Creek is glacial fed. Its headwaters are very attractive with numerous slides and meadows. Outdoor recreation such as hiking, photography and camping rate much higher than the fishing capabilities.


V
IV
III
II
I
8
7
6
5
4
3
2
1
N
FISH DISTRIBUTION
STREAMS WITH FISH
SPAWNING AREAS
MARGINAL HABITAT
NIL
DEWAR CREEK

GENERAL DESCRIPTION

Section I

This lower portion of the stream extends 0.6 miles upstream from its confluence with White Creek. The gradient is 1.6% (estimated from topographic map) and the substrate is mainly rubble six to twelve inches in size. Spawning habitat was found throughout, but mainly in large pools. Stream banks in this section are unstable due in part to logging. Stumps and old logging debris are evident and the stream banks have yet to stabilize thus exposed banks continue to be sources of erosion.

Fishing in this section of the stream was more intensive than in any other. Very few anglers were successful, due to the lack of large holding pools and suitable cover for fish. In one instance three anglers were checked with twelve fish, nine of these were taken from one pool.

Section II

This portion of Dewar Creek, approximately eleven miles in length, has a gradient of 1.4 percent. It is generally inaccessible with steep side slopes. The logging road is located high above the river and is separated from it by thick immature larch and downed timber from a forest fire. Upstream from Coppery Creek (tributary 2) the logging road has been constructed five chains away from the stream on the east side. Access along the stream is good with mature forest cover in the river bottom. The substrate is rubble and gravel with some exposed bedrock. Spawning probably occurs throughout especially in large pools where suitable

gravel is abundant. A 40:60 pool to riffle ratio was estimated, but most pools were shallow and most fish appeared to be limited to the deeper pools (scuba survey). Stream bank cover is mainly alder but in the burnt area there is poor cover and very little shade. The steep side hills appear unstable with frequent sluffing and snow slides.

Angling success in this section was rated as good when anglers struggled to reach the inaccessible portions. Most of this stream section was fished lightly with no more than two or three vehicles at any one time. Cutthroat trout were the dominant species but a few large mountain whitefish (Prosopium willia msoni) and Dolly Varden were also found.

Section III

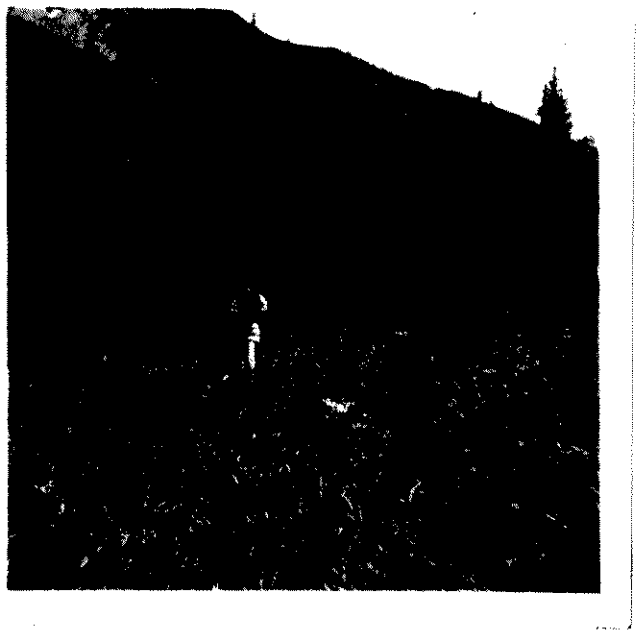
This heavily forested section of stream has an estimated gradient of one percent. The substrate is mainly boulder and bedrock. The stream is very stable with heavy alder growth and mature timber to the stream bank. Logging development has left a five chain green strip in this area, so stream integrity remains unchanged. If the green strip is not maintained the wet bog-like soil could be a major erosion problem.

Fish were angled throughout this section of river with limit catches of cutthroat trout to sixteen inches. Angling pressure was almost non-existant, with logging activities hampering access.

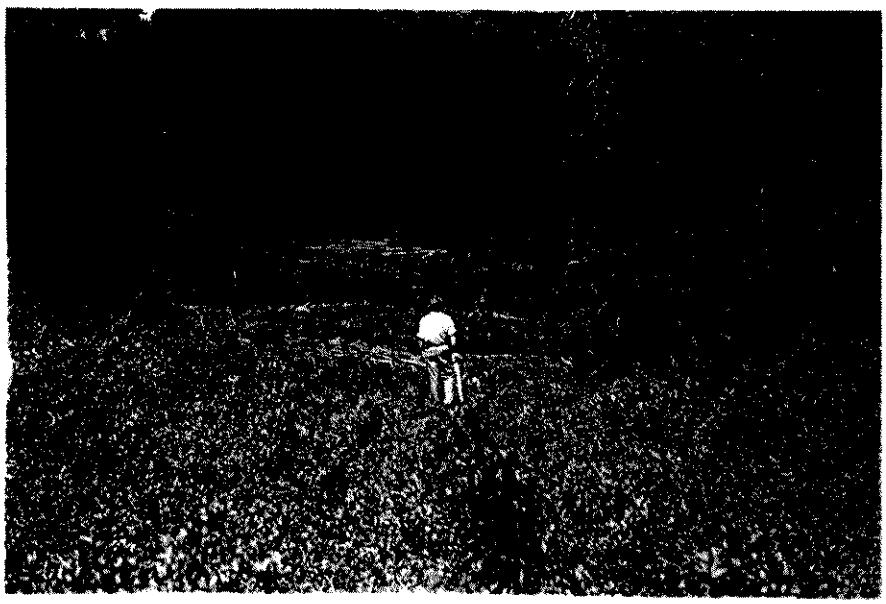
Section IV

The gradient through this 5.3 miles of stream is approximately 1.4 percent. The substrate is mainly gravel and rubble with excellent spawning habitat throughout. Electrofishing upstream

Dewar Creek



Horse trail through meadows on upper Dewar Creek.



Open meadows and slides offer excellent habitat for wildlife.

from the confluence of Westly Creek (tributary 5) revealed numerous juvenile cutthroat and Dolly Varden. Stream bank cover is mainly scrub alder, grasses and mature spruce.

The bog-like soil in this area is susceptible to frequent seepage and channelization. It appears that any major disturbance of the stream banks will create major erosion problems and result in lowering the quality of spawning habitat and reduction of available rearing habitat.

A ten foot waterfall located at the upper end of this section is definitely a barrier to all upstream migrants. Numerous fish were seen in the pool below these falls. Access in this area is by horse trail only. Very little angling pressure was observed.

Section V

This headwater portion of the stream begins with the waterfall mentioned above. The gradient is eight percent in the lower portion of this section but increases substantially in the vicinity of the glaciers. The substrate is large boulder and bedrock with limited spawning habitat observed. Fish were not seen during the survey although it is quite likely that small resident cutthroat and Dolly Varden inhabit this section. Habitat is generally suitable for fish production. This portion of the system is composed of patches of spruce with numerous slides utilized by deer and elk.

Tributary 1

This tributary is too steep for fish production. Its flow is approximately 2 c.f.s. and the substrate is mainly large

Section IV of Dewar Creek, notice the thick stream bank cover and stable stream banks.

Logging debris on tributary 2 of Dewar Creek

boulders. The stream flows through an immature stand of larch and it is choked with debris from a past fire.

Tributary 2 (Coppery Creek)

This tributary is fifteen feet wide and has a flow of 20 c.f.s. The substrate is mainly large boulders and gravel. Stream banks are heavily timbered (cedar-fir) with scrub alder evident on the banks. Gradient is steep with numerous small water falls (5-8 feet) with log jams which probably create barriers to upstream migration. Electrofishing produced numerous small cut-throat trout averaging four inches. Small juvenile fish were found in the lower 200 yards of this stream indicating possible spawning and rearing potential for mainstem (Dewar) fish.

Logging road construction has left debris in the stream. At one point the stream was blocked off completely and timber was felled across the stream.

Tributary 3

Tributary 3 was not looked at in detail, but it is very similar to Calamity Creek.

Tributary 4 (Calamity Creek)

Calamity Creek is twenty feet wide and has a flow of approximately 40 c.f.s. It has a rubble substrate with spawning gravel found throughout the stream in pools and behind large rocks. Stream bank cover is heavy scrub alder as well as a good stand of mature timber. Walking upstream from its confluence with Dewar Creek for one and one-half miles revealed no barrier or falls.

Electrofishing upstream from the confluence produced cutthroat trout, Dolly Varden and sculpins. Average size was six inches and maximum length ten inches for cutthroat and Dolly Varden. The potential for rearing appears to be good throughout the stream.

Tributary 5 (Westly Creek)

This tributary had the highest density of fish compared with other tributaries. Electrofishing produced numerous Dolly Varden but no cutthroat trout. The section of stream tested consisted of large boulder substrate and Dolly Varden were abundant in this type of habitat. Possibly the lack of deep pools in this stream resulted in the absence of cutthroat.

The flow in this stream was about 35 c.f.s. Substrate ranged from large boulders to fine rubble. Gravel was more predominant in the first half mile. Stream bank cover is heavy alder and mature fir and spruce. Spawning gravel was found in pockets throughout the stream. In the authors opinion this stream is a very important spawning and rearing area for Dolly Varden. No major barriers were noted in the first one mile of this tributary.

Tributary 6 and 7

These two tributaries were viewed briefly. They are both small and precipitous with an approximate flow of 10-15 c.f.s. The lower one-half mile of each of these streams is suitable for fish rearing and spawning. Substrate is mainly boulder and rubble with gravel dominant in the lower 200 yards. Cutthroat were seen in the lower portions of these streams, but numerous falls and log

Tributary 5 - Westly Creek
Current logging on Section III of Dewar Creek.

jams prevent upstream migrations.

Tributary 8

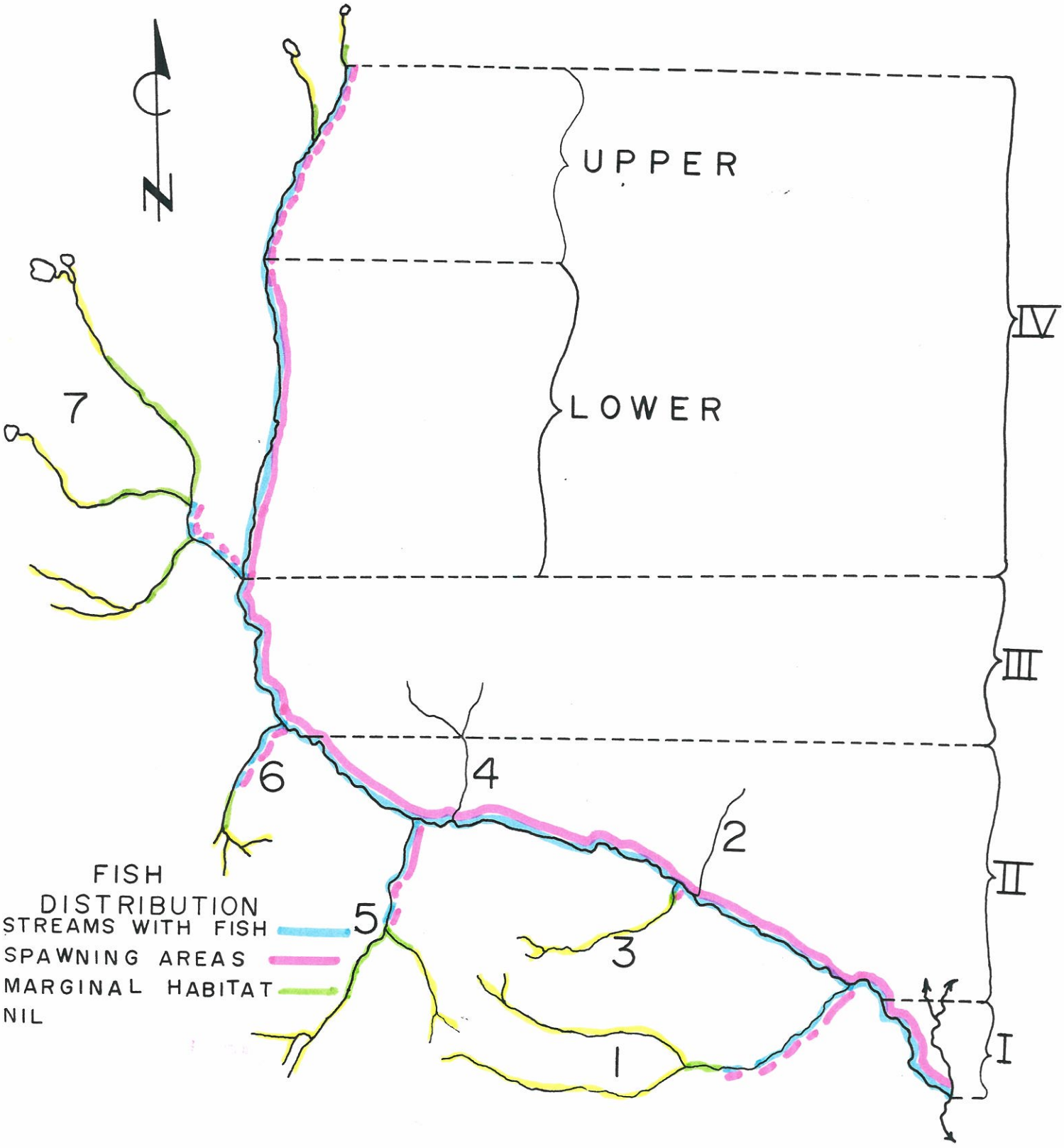
This stream has a steep gradient and numerous small falls would produce barriers for most fish. The water in this stream had a glacial colour, even in mid-summer. The flow was estimated at almost 100 c.f.s. The substrate is mainly large boulder, rubble and bedrock. Stream bank vegetation is scrub alder and mature fir-spruce.

No fish were angled from this stream due possibly to the fast flowing water and turbidity. Habitat is suitable for good rearing but spawning habitat is very limited.

C. West Fork St. Mary River

The West Fork of St. Mary River is a medium size stream that flows from the east slope of the Purcell Mountains in a south easterly direction to its confluence with Dewar Creek and White Creek. During the study the minimum flow was estimated at approximately 350 c.f.s. The stream channel is relatively stable with the exception of the logged area adjacent to Lapointe Creek. Stream bank cover is good throughout except in the logged area where logging to the stream bank and gravel removal has left little or no vegetation. The gradient is about two percent with seventy to ninety percent riffle.

Mainstream populations seem to be quite limited. Angling for extensive periods of time in inaccessible areas produced very few fish. Success was better in the section of stream downstream from the unlogged area (39 mile on logging road). Most tributary



WEST FORK ST. MARY RIVER

West Fork

Headwaters of West Fork.

Section II of West Fork. Note the steep gradient and large boulder substrate.

streams appeared to be productive and electrofishing in Section IV produced numerous small cutthroat trout, Dolly Varden and sculpins. Sections I and II had relatively few fish.

Angling pressure throughout the summer was not intensive and success was very poor. Many local residents report fishing in the past prior to logging was excellent. The lack of holding pools probably limits the fish production in most of the West Fork.

Section I

The first two miles of this stream upstream of its confluence with Dewar Creek has a gradient of 0.7 percent. The substrate is gravel and rubble with stream bank vegetation sparse because of the braided characteristics of the stream. No fish samples were taken from this section and no anglers were observed. Habitat for rearing and spawning appeared excellent. A 40:60 pool to riffle ratio and numerous cut banks provide suitable cover and good conditions for fish and angling.

It is strange and unexplainable that similar habitat on White Creek and Dewar Creek produced obvious numbers of fish. Much of the West Fork seemed conspicuously void of a stable fish population.

Section II

This 1.5 miles of stream has a gradient of about 1.6 percent. The substrate is mainly boulder and bedrock with some gravel and sand dispersed throughout. Stream bank cover is heavy scrub alder in most areas and mature cedar-hemlock for coniferous cover, (selectively logged in many areas).

Only a few anglers were checked in this area. Their success was very poor and only two fish (cutthroat) were taken by angling in this section. Scuba diving a two mile section revealed no observed fish. There were very few deep pools in this section, but even the deep pools seemed to be devoid of pools and numerous small falls which would be barriers to most small cutthroat and Dolly Varden.

Section III

This area has a gradient of 1.4 percent. The substrate is mainly gravel and boulders with many good potential spawning sites throughout. Mature Dolly Varden in spawning condition were found in this section (up to three and one-half pounds). Stream bank vegetation has been disrupted considerably by logging activity in the last few years. In some areas logging developments have created major erosion problems. Gravel removal from the mainstream, skidding across the river, huge cut blocks and logging to the stream bank through most of this section have seriously affected the integrity of the stream.

Angling produced a reasonable number of fish (cutthroat and Dolly Varden) and this section was the only area that produced any fish in the anglers creel. Two anglers fished two and one-half days to catch ten fish, but they remarked that fishing in past years was more productive. Success of the survey crew was at best one fish per hour in the stream adjacent to forested land at the top boundary of this section.

Section IV

A. Lower

This section has a gradient of 2.2 percent with substrate composed mainly of boulders. Ninety percent of the stream is riffle. Angling with a fly rod did not produce any fish, but electrofishing revealed numerous small cutthroat, Dolly Varden and sculpins. Spawning and rearing sites are plentiful with numerous juvenile fish found throughout.

Forest development has started in the lower portion of this section. A five chain (plus) green strip has been left at this time and therefore the stream integrity has not been changed very much. Clear cut logging in Section III should not be repeated in this area. Seepage areas and deep soils adjacent to the stream pose as potential problems if logging is conducted to the stream's edge.

B. Upper

This section has a gradient of 5.8 percent. The area was not surveyed on the ground. It is known however that cutthroat trout are distributed to the headwaters (personal communication, R.A. Seaton). It is likely that cotids and Dolly Varden also inhabit this section.

Tributary 1 (Hungary Creek)

Hungary Creek is twenty feet wide and has a flow of approximately 40 c.f.s. Substrate is large boulders with limited spawning potential in the lower portion of the stream. Gradient is steep with very few pools. Some small fish (cutthroat) were observed in the lower one mile portion of the stream. Vegetation is sparse due to a recent forest fire.

Tributary 2 (Morris Creek) and Tributary 3 (Flatrock Creek)

These tributaries are too small and precipitous to be of any value for fisheries. The lower section of Flatrock Creek has some suitable habitat, but during the summer the stream nearly dried up.

Tributary 4

This small tributary has a seasonal flow. The potential for fish rearing or spawning is almost nonexistent. The stream is steep and clogged with debris. During high water and heavy rains the silt load could be substantial.

Tributary 5 (Sawyer Creek)

The gradient of Sawyer Creek is the unfavourable limitation with numerous small falls and barriers throughout. However, despite these limitations Sawyer Creek appears to be fairly productive. Flow was estimated at 50 c.f.s. Substrate is boulder and bedrock with very little spawning potential. Stream banks are very bushy with scrub alder the dominant species. Both sides of the stream have been selectively logged causing noticeable stream bank erosion and frequent wind falls lie across the stream. No major log jams were seen.

Electrofishing revealed an abundant population of resident cutthroat trout averaging 6.5 inches (maximum length being ten inches). No angling for these fish was observed.

Tributary 6 (Lapointe Creek)

This stream is approximately ten feet wide and has an estimated flow of 15 c.f.s Substrate is boulder and rubble with

Tributary 7 of West Fork. Note large boulder substrate and heavy scrub alder vegetation.

Section III of West Fork. Field crew checking fish trap during high flows.

Sawyer Creek - Tributary 5 of West Fork. Photo shows debris resulting from selective logging.

fine gravel and sand in lower portion downstream from the logged area. The lower 200 yards of this stream is partially clogged with logs from stream bank erosion. This stream has been severely affected by logging and the potential for fish production has been greatly reduced.

Electrofishing produced cutthroat and Dolly Varden averaging less than six inches. Fry of either species were not found or observed.

Tributary 7

This large tributary is approximately thirty feet wide with a flow of 80 c.f.s. It has a large boulder and rubble substrate and a steep gradient composed of about ninety percent riffle. Vegetation is balsam-spruce with heavy scrub alder growth on the stream banks. There is very little windfall and the stream banks are stable. Habitat appears to be excellent particularly for fish rearing and suitable spawning habitat was found in some areas. Despite the fact that sampling did not produce any fish in the lower one-half mile of stream, there is little doubt that this tributary supports fish.

ANGLER EFFORT AND CATCH

White, Dewar and West Fork, all tributaries of the St. Mary River, were checked during July and September for angler use and subsequent catch. The month of August was not covered due to an unexpected forest closure which effectively prevented anyone from fishing in these streams. In all three streams cutthroat trout are the predominant fish sought by anglers. Almost all

angling recorded was conducted on the mainstem streams. Virtually no fishing was recorded on side tributaries.

A. White Creek

Of the three tributaries checked, White Creek by far was the most productive fishery. Cutthroat trout from 6 - 16 inches were caught as well as a few large Dolly Varden.

Fishing effort on this stream was considered heavy. The success ratio of 1.72 recorded for July indicates an adequate population of fish initially available to the angler. However, as effort continued the effects of fishing was reflected by a gradual decline in success. Despite closure of the stream (due to the forest closure) in August, recruitment of younger fish was not sufficient and consequently the success ratio in September declined to 0.49. The effects of 'over fishing' were reflected in decreased size of fish as summer advanced.

Access dictates availability of fishing opportunity on White Creek. Perhaps a trail building program along White Creek should be considered in order to spread out the number of anglers. In addition, some regulation changes should be considered if quality fishing is to be retained.

Estimated Minimum Catch And Effort

AREA	MONTH	NUMBER OF ANGLERS	ANGLER HOURS	CATCH	SUCCESS
White Creek	July	205	541	930C.T. 13D.V.	1.72
	Sept.	196	1076	522C.T.	0.49

B. Dewar Creek

Dewar Creek was very lightly fished during the summer of 1973. No doubt this was partly due to logging activity (trucks) which tended to discourage many anglers. Tradition also accounts for light effort in Dewar Creek. That is, most local anglers prefer White Creek because of well established access and consistent catches over the years. With the possible closure of White Creek in 1975, many anglers will shift to Dewar Creek.

Estimated Minimum Catch And Effort

AREA	MONTH	NUMBER OF ANGLERS	ANGLER HOURS	CATCH	SUCCESS
Dewar Creek	July	10	20	20C.T. 3W.	1.00
	Sept.	30	100	68C.T. 5D.V.	0.68

C. West Fork

Angling effort and catch on the West Fork was virtually negligible. Travel distance, lack of pools and better alternatives (main St. Mary River and White Creek) probably account for sparse use of this stream. The upper reaches of West Fork support cutthroat in reasonable numbers and the possible closure of White Creek in 1975 will force anglers to use the West Fork more than before.

Estimated Minimum Catch And Effort

AREA	MONTH	NUMBER OF ANGLERS	ANGLER HOURS	CATCH	SUCCESS
West Fork	July	65	69	4C.T.	0.06
	Sept.	73	160	43C.T. 3D.V.	0.33

AGE CLASS DISTRIBUTION

St. Mary River Cutthroat Trout

Angler caught cutthroat trout from the West Fork, White Creek and Dewar Creek systems were aged by scale determination. The following table provides a breakdown of fish caught primarily during July and August.

DEWAR CREEK

AGE	NUMBER OF FISH	AVERAGE LENGTH (IN CM.)
0+	0	0
1+	4	14
2+	25	19
3+	23	26
4+	4	33
5+	3	35

WHITE CREEK

0+	0	0
1+	14	14
2+	33	19
3+	41	24
4+	5	32
5+	0	0

WEST FORK

0+	0	-
1+	0	-
2+	3	22
3+	9	26
4+	5	34
5+	0	-

The majority of fish caught were 2+ and 3+ old fish.

SPAWNING OBSERVATIONS

Numerous cutthroat trout and Dolly Varden were observed either in the mature or recently spawned out condition in all three tributaries of the St. Mary River. Whereas many sections of stream

offered apparently negligible habitat for spawning, a few areas were classified as excellent spawning habitat. It is reasonable to assume that in-stream movement of resident fish does occur. Also, it is likely that accessible side tributaries play an important role as spawning and rearing habitat.

White Creek

Sections IV and VI as stated previously has a fine sand and pea gravel substrate. Early in July numerous cutthroat trout were observed in slow moving waters. Some of these fish were paired up while others were in groups under the stream bank. Fly fishing produced a few of these fish, some of which were in spawning condition with eggs singled out or partially separated. Many of the fish had finished spawning but still had one or two eggs in the body cavity. There is little doubt that Section VI is the most important area of spawning habitat in the entire White Creek system. In mid July a sample of angler caught cutthroat from the beaver ponds (Section X) revealed a similar situation. Many fish from 8" to 14" had single eggs in the body cavity.

Dewar Creek

In July a few fish were taken from Section III in spawned out condition. These fish were taken downstream from a small falls adjacent to logging area.

Section IV was not observed until later in the season. Taking into account the occurence of fry in this section and abundance of spawning sites, this section would appear to be suitable for spawning and rearing.

West Fork

Large numbers of fish were not found in this stream and therefore spawning observations were limited.

Some Dolly Varden were found in Section III in August and September. Some of these fish appeared to be spawned out and they were in poor condition. A four pound female Dolly Varden was caught in ripe condition in this section. It is quite possible that these fish inhabit St. Mary Lake and migrate up the West Fork for spawning purposes. Electrofishing revealed the occurrence of juvenile fish in Section IV and in tributary streams, ie. Sawyer Creek, Lapointe Creek. Because of the large concentration of juvenile cutthroat trout in these areas, it is reasonable to assume spawning occurs in these tributaries and/or in the West Fork.

FISH MOVEMENTS

Investigation of fish movements within the systems studied was not conceptualized in the original study proposal. However, some work was prompted because of reports by many anglers that success on West Fork of St. Mary River was better at a specific time -usually in August. This would indicate some type of movement of fish either from the headwaters or the main stream St. Mary River or Lake.

From July 25 to September 5 a portable fish trap was placed in the stream (Section III) near the confluence of Lapointe Creek. The trap was first placed in the stream in two locations to catch fish moving in a downstream direction. Very few fish were trapped by this method - 3 small cutthroat and 2 small Dolly Varden.

Next the trap was set up to trap fish moving in an upstream direction. More fish were trapped by this method - 8 Dolly Varden and 6 cutthroat.

The few results obtained indicate no major migrations of fish occurred during the time of trapping (July 25 - September 5). However, local movements of fish were observed, ie. movements between pools. If fish migrate up or down the system during a specific period, further studies should be done to clarify this. Certainly it was not the case during the study period because creel census and personal observations did not indicate any substantial changes in success.

STOMACH ANALYSIS OF ST. MARY RIVER

A random sample of stomachs were taken from angler caught fish and their contents were measured by volumetric measurements. The volume of surface (winged) insects, non-winged insects (larvae, etc.), bottom debris and unidentified materials was taken to compare differences in food materials. The stomach analysis results shown in the following table indicates summer food habits of stream dwelling cutthroat trout.

STOMACH SAMPLE DATA

CUTTHROAT TROUT SUMMER FOOD HABITS

ST. MARY RIVER SYSTEM

WEST FORK ST. MARY RIVER

	Surface Insects	Non-winged Insects	Bottom Debris	Unidentified (rotten)	Total (ml.)	Mean (ml.)
8 samples	18.7 ml. 60%	3.9 ml. 12%	0.5 ml. 0.0%	8.4 ml. 28%	3115	4

WHITE CREEK

	Surface Insects	Non-winged Insects	Bottom Debris	Unidentified (rotten)	Total (ml.)	Mean (ml.)
41 samples	41.2 ml. 25%	94.4 ml. 57%	16.5 ml. 10%	12.9 ml. 8%	165	4

DEWAR CREEK

32 samples	85.3 ml. 82%	12.1 ml. 12%	1.8 ml. 2%	5.1 ml. 4%	104.3	3.3

It is reasonable to assume that these fish are opportunists - ie. they will feed on whatever food is available. Food habits appear to vary according to the stream side habitat. For example, it was found that a sample of fish taken from the lower portion of Dewar Creek (Section II) contained mainly surface insects, whereas a sample taken from White Creek (Section IV) contained mostly aquatic insects. The difference in stream side vegetation and stream gradient were the probable causes of this variation.

DISCUSSION

Perhaps the most striking feature of this survey was how streams within the St. Mary River watershed were becoming more and more accessible (due to logging roads) and yet stream inventory information is only now being gathered. To date the lack of good inventory information has unquestionably led to unnecessary damage of cutthroat trout habitat. A case in point was the damage observed in the lower reaches of Lapointe Creek.

This survey has found that each major tributary stream supports its own population of Yellowstone cutthroat trout. In

addition to these resident populations, there is evidence which suggests the smaller tributary streams support their own resident populations and also support rearing and spawning habitat for the major systems (ie. White, Dewar and West Fork).

It is difficult to imagine that cutthroat fishing in a stream can be much better than that observed and experienced in White Creek. As fishing pressure increases some new management programs will have to be implemented on White Creek which in 1973 was the most heavily utilized stream.

Stream fishing in the East Kootenays provides a great deal of recreational pleasure to an ever increasing number of residents. Whereas specific management techniques are important (ie. seasons and limits) there is little doubt that the real gains to be made in protecting these stream fisheries is in integrating information such as this in well designed logging plans.

RECOMMENDATIONS

1. Compare catch data from 1973 to 1974 on White Creek. If statistics indicate continued decrease in success and significant alterations in age class and size then fishing closures will be warranted.

2. All logging development should be keyed towards eliminating siltation and maintaining stream integrity. This would mean the protection of stream banks and shade canopy along those streams indicated as fish producers.

The basic conditions are as follows:

a. Elimination of siltation caused by driving equipment through major or minor streams. Stop the hauling of logs through

streams wherever possible, especially in areas where alternative routes could be taken to avoid this problem.

b. Culverts or bridges should be used where skid trails or cat trails cross streams. Culverts or temporary bridges should be used in the primary phase of road building before being crossed.

3. Stream inventory should be expanded in the Kootenay region to quantify fishery values on as many watersheds as possible. This inventory should be conducted prior to logging development so specific recommendations may be made to protect stream values.

4. Further studies to evaluate spawning habits, juvenile rearing areas, fish movements, feeding habits, growth and habitat preferences of cutthroat should be undertaken to aid in fishery management.

5. Continue creel census on those streams with heavy angling pressure to determine if numbers of fish available and success ratios are maintaining a reasonable level. If not, changes in regulations may be warranted.

6. If possible begin a trail building program along White Creek to distribute anglers over a larger area with help and agreement from local Fish and Game Club members.