MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION

Proposed Young Creek Development

Development of Young Creek is one of two fishery projects related to Libby Reservoir that has been funded by the Corps of Engineers. Basically this project entails transforming a small stream inhabited by resident fish to a stream geared to produce game fish for Libby Reservoir.

The transformation of Young Creek to a spawning tributary for fish from Libby Reservoir entails work in four areas. These areas of work are described as follows: (1) construction and operation of a fish barrier trap near the mouth of the creek; (2) removal of all barriers from the stream channel that are or might inhibit free movement of fish within the drainage; (3) suppression of the resident fish population so that migratory fish can be established; and, (4) establishment of a migratory fish population.

Construction-operation of Fish Barrier Trap

The Corps of Engineers has built a basic fish barrier suitable for installation of an upstream-downstream fish trap. Montana Fish and Game Department will install, operate, and maintain this upstream-downstream trap as needed. This structure is located about 500 feet above Libby Reservoir highwater mark in Section 24, T37N, R28W.

Removal of Barriers

The extent and intensity of this barrier removal program is necessarily determined by the species of fish to be induced to spawn in Young Creek. It is anticipated that westslope cutthroat trout (Salmo clarki subsp.), mountain whitefish (Prosopium williamsoni), and Dolly Varden (Salvelinus malma) will successfully reproduce in the creek. Each of these three species has different spawning requirements and physical stamina. Barrier removal needs are determined by each species' stamina.

The westslope cutthroat trout spawns in the spring, usually during the period of highest run-off. These fish are strong swimmers and can negotiate velocities up to about 16 fps for short distances (10 to 15 feet). They are able to jump about four feet high if the take-off point is at least eight inches deep and landing point has velocities not greater than nine fps. If Young Creek were to be developed only for the cutthroat, barrier removal could be kept to a minimum.

Many of the stream obstructions present in Young Creek are not barriers to movement of cutthroat trout but are barriers to movement of either or both Dolly Varden and mountain whitefish. Like the cutthroat, Dolly Varden are strong swimmers with considerable jumping ability. These fish are fall spawners and enter the spawning stream in late summer in periods of low water flows. Obstacles that may not be barriers to cutthroat can prevent movement of Dolly Varden. As an

example, a trash barrier with water flowing over the top or around the sides during high flows will not stop cutthroat. This same barrier will probably be an obstacle to Dolly Varden during summer flows because water will only be flowing through the trash.

Unlike the Dolly Varden and cutthroat trout, the whitefish is not a strong swimmer and has poor jumping ability. Water velocities of about eight fps and falls more than two feet high will stop this species. This fish enters the spawning stream in October and November at which time stream flow is near minimum. Recognizing the whitefish's swimming abilities coupled with stream condition during spawning, obstacles that are not barriers to either Dolly Varden or cutthroat trout are frequently barriers to whitefish.

Another factor concerning the barrier removal program is that different areas of Young Creek will be used for spawning by the three species. Whitefish appear to travel no further upstream than need be. It is anticipated that whitefish spawning will be concentrated primarily within the first four miles of Young Creek. Both the Dolly Varden and cutthroat trout will scatter throughout the entire drainage but spawning activities should be heaviest in the upper six miles of creek.

Montana Fish and Game Department personnel surveyed Young Creek with respect to barrier removal needs in summer 1967 and 1969. These surveys showed that about 90 to 100 barriers or potential barriers should be removed. A barrier was classified as an obstacle if it would stop upstream movement of any of the three species of fish. A potential barrier was classified as an obstacle that, with some additional accumulation of trash, could easily become a barrier to any of the three species of fish. Further, the barriers were classified as to origin: man-made, animal-made, or accumulated trash.

One man-made barrier, consisting of sawmill waste wood, was found. Seventeen inactive beaver dams were found that will have to be removed. Three active beaver dams were found outside of the Young Creek meadows. These dams and the beaver will have to be removed. Beaver appear to be fairly numerous in Young Creek meadow. Intensive trapping of these beaver will be initiated in cooperation with the private landowners. The remaining obstacles were either log jams or trash dams. Approximate locations of the barriers are shown in Figure 1.

The channel clearance program is not intended to remove excessive amounts of stream debris, but merely to insure that spawning fish have free access to spawning areas. It is not the intent of this program to destroy habitat, but to enhance it for the good of both the Libby Reservoir and Young Creek fishery.

Removal of barriers will be done primarily by using hand tools, chain saws, a portable winch, and some blasting powder. In many cases only a portion of a barrier will have to be removed to insure fish passage, thus retaining necessary stream cover. Explosives will be used only where judged not detrimental to adjacent stream or land, or where its use will mean considerable savings in effort. The surveys conducted to date show that explosives can be used to good advantage in about a dozen sites. Removal of the sawmill slash will be done either by burning, employment of a dozer, or hand removal.

FIGURE 1. Location of barriers in Young Creek

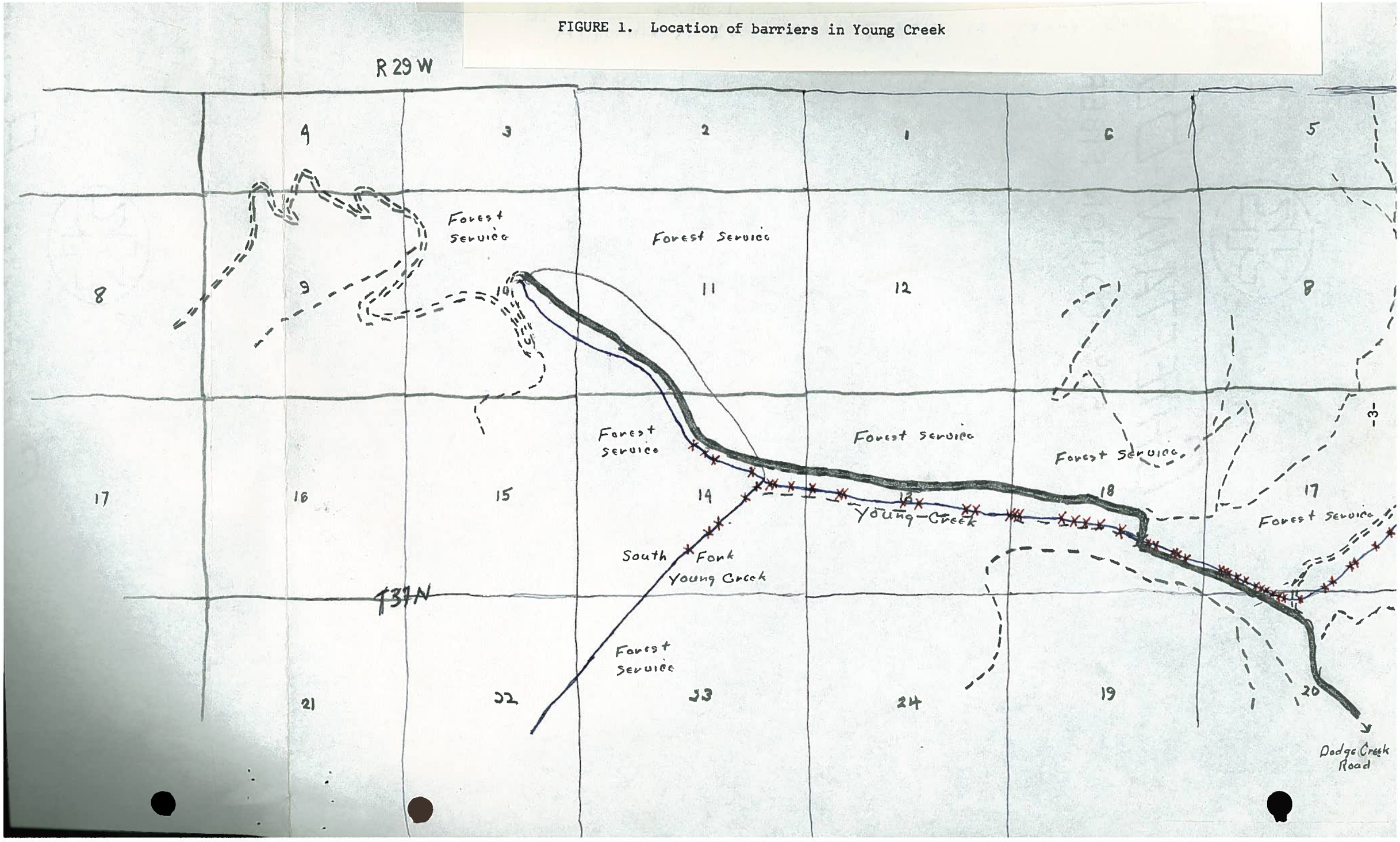
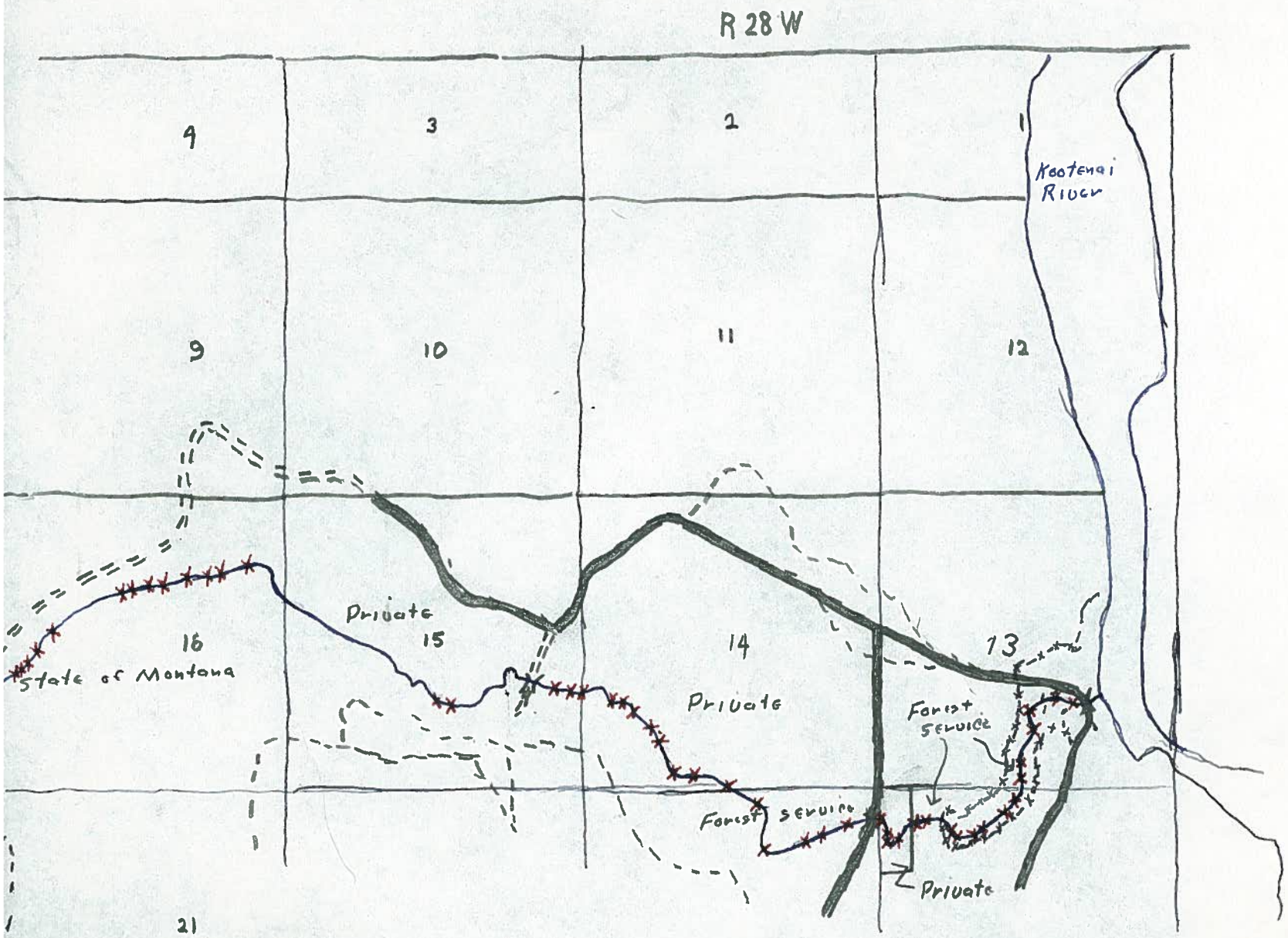


FIGURE 1 (Continued)



Legend

- Major county F.S. roads
- Minor roads
- Trails
- Reservoir pool level
- Barrier site

Since much of Young Creek flows through private property, some debris will likely be piled and burned. Landowners will be contacted and their wishes followed. Some large trash barriers exist on Forest Service land which is scheduled for campground development. If so desired, this will also be piled and burned.

Land ownership patterns on Young Creek will affect the means of performing barrier removal work. This creek flows through Forest Service land, State of Montana land, and land under private ownership. Of the total stream miles under consideration about seven miles are under federal control, about two miles under state control, and about three miles under private control. There has been some question concerning which agency (Forest Service, Corps of Engineers, Fish and Game Department) should do the clearance work.

It is believed that Montana Fish and Game Department is best equipped to perform the necessary work. Classification of streambed obstacles as to whether they are barriers or potential barriers is difficult at best. Only personnel experienced in observing reactions of the fishes to obstacle situations in other streams have the knowledge to make the needed judgments in Young Creek. Department personnel have this experience from working with spawning runs of cutthroat trout, whitefish and Dolly Varden in the Flathead River system.

Land ownership patterns also indicate that the Department should be the agency to remove the barriers. Forest Service crews could do the work on their land, but could not on private land; a state crew would have the responsibility of work on private land. A combination of state and Forest Service crews could easily increase the cost of the operation, create administrative problems, and result in a poorer quality job. Barrier removal work will have to be done in a time relation with other Young Creek work schedules.

Fish and Game Department estimates of the time needed for completion of all proposed work on the creek have been made. It is anticipated that the work will start July 13, 1970 and be completed August 19, 1970. Removal of beaver will be done throughout the year as needed but preferably during the 1970-71 trapping season. Cost estimate of this work is presented in Table 1.

Supression of Resident Fish Population

Immediately following removal of channel obstacles, chemical suppression of the resident fish population will start. The area of the drainage treated will depend upon densities of game fish spawning runs entering Young Creek from Kootenai River at the present time. If significant spawning runs do enter Young Creek, suppression work will be modified to save these fish and their progeny. Spawning run densities will be determined from operation of the barrier fish trap already constructed in Young Creek.

Observations during fall 1969 showed that no whitefish enter this drainage for spawning. Landowners on Young Creek report that some cutthroat do enter the drainage each spring for spawning. The size of this run is not known at this time but will be determined in spring 1970. Barrier surveys of 1967 and 1969 give firm indications of how far up the drainage these fish could possibly travel.

TABLE 1. Cost estimate, removal of barriers

Project biologist, 38 days @ $29.33/day	$ 1,114.54
Equipment - powder man, 38 days @ $26.67/day	1,013.46
Labor, 114 days @ $13.33/day	1,519.62
Total Salaries	$ 3,647.62
Employee benefits, PERS, Ind. Acc., Soc. Sec. (10% of salaries)	364.76
Total Salaries and Benefits	$ 4,012.38
Subsistence and lodging expenses $50/week/man for 21.6 weeks	1,080.00
Vehicle mileage, 2,260 miles @ 10¢ per mile	226.00
Equipment rental Chain saws, winch, dozer, drills, hand tools, cable, etc.	500.00
Expendable equipment Boots, gasoline, oil, chains, powder, etc.	100.00
GRAND TOTAL	$ 5,918.38

Landowners also reported that in years past Dolly Varden entered Young Creek but that no fish have been observed in recent years. The 1967 survey showed barriers present near the mouth of Young Creek that would stop Dolly Varden.

Chemical suppression of fish populations in Young Creek could follow two plans depending upon density and extent of existing spawning run of cutthroat trout. Plan "A" entails suppression in all mainstem Young Creek and depends upon finding either a very small population of cutthroat migrant spawners or none at all. Plan "B" entails suppression of the portion of creek not currently used by migrant cutthroat spawners and depends upon a fair number of spawners entering the drainage from Kootenai River.

Data collected in September 1969 show that a complete water exchange occurs in Young Creek from the junction of the South Fork and North Fork to its mouth in about 16 hours. About two hours are needed for water to pass through two

miles of each fork. Flow throughout the area below this juntion averaged about 10 cfs and about 5 cfs in each fork. Application of the chemical will be regulated to maintain a toxic concentration in each fork and mainstem for a period of about 18 hours. If only a portion of Young Creek is treated, the suppression chemical will be detoxified at the lower end of the portion of the stream.

Restocking of Young Creek

Within a few days after the stream becomes detoxified, Young Creek will be planted with large numbers of fry, yearling, and sub-catchable westslope cutthroat trout. The fish to be planted originated from cutthroat spawners from Hungry Horse Reservoir taken during their spawning migration into Hungry Horse Creek. The eggs of whitefish taken from Kootenai River will be planted in the lower reaches of Young Creek in late fall 1970. Dolly Varden eggs or fish are very difficult to obtain as few conservation agencies maintain hatchery stocks. Planting of Young Creek with this species may require extensive field operations to obtain the necessary fish or exchange agreements with other agencies. These fish will be stocked when available.

Prepared by Joe E. Huston

Date December 15, 1969