



Utilization of the mountain whitefish *Coregonus Williamsoni* in Montana
by John J Gaffney

A THESIS Submitted to the Graduate Faculty in partial fulfillment of the requirements for a degree of
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Abstract:

The mountain whitefish (*Coregonus williamsoni*) is one of the most abundant cold water game fish in Montana. It is associated with several species of trout in the three major drainages: Columbia, Missouri and Saskatchewan. Although it is gamey and has palatable flesh, it has been little utilized by fishermen. The most intensive fishery on this species occurs in the winter when trout fishing is prohibited. A study was conducted from July 1952-to March 1954 to obtain information on distribution, abundance, effective methods of capture and methods of utilization including preparation, cooking and smoking. Illustrations are included to supplement descriptions of techniques.

This whitefish is found in most of the cold waters that drain the western half of the state. It is most abundant in the larger rivers and lower portions of primary tributaries but also occurs less commonly in secondary "tributaries and "headwater streams. A fly rod was useful for taking whitefish during the summer but a cane pole was more satisfactory during the winter. Whitefish are taken on live bait during all seasons and on artificial flies during the summer. Effective live baits were Plecoptera nymphs, maggots, earthworms and grasshoppers. Artificial flies tied on small hooks were most effective. The color or pattern of the fly was found to be of minor importance. Experiments were conducted to test the palatability of whitefish as compared to trout. The white-fish were rated favorably but trout were rated higher in some categories. Three types of units were found to be satisfactory for smoking whitefish and smoking methods are given. The information obtained in this study will be made available to the fishing public in order to encourage greater utilization of this game fish.

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IN MONTANA

by

JOHN J. GAFFNEY

A THESIS

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ABSTRACT

The mountain whitefish (Coregonus williamsoni) is one of the most abundant cold water game fish in Montana. It is associated with several species of trout in the three major drainages: Columbia, Missouri and Saskatchewan. Although it is gamey and has palatable flesh, it has been little utilized by fishermen. The most intensive fishery on this species occurs in the winter when trout fishing is prohibited. A study was conducted from July 1952 to March 1954 to obtain information on distribution, abundance, effective methods of capture and methods of utilization including preparation, cooking and smoking. Illustrations are included to supplement descriptions of techniques.

This whitefish is found in most of the cold waters that drain the western half of the state. It is most abundant in the larger rivers and lower portions of primary tributaries but also occurs less commonly in secondary tributaries and headwater streams. A fly rod was useful for taking whitefish during the summer but a cane pole was more satisfactory during the winter. Whitefish are taken on live bait during all seasons and on artificial flies during the summer. Effective live baits were Plecoptera nymphs, maggots, earthworms and grasshoppers. Artificial flies tied on small hooks were most effective. The color or pattern of the fly was found to be of minor importance. Experiments were conducted to test the palatability of whitefish as compared to trout. The whitefish were rated favorably but trout were rated higher in some categories. Three types of units were found to be satisfactory for smoking whitefish and smoking methods are given. The information obtained in this study will be made available to the fishing public in order to encourage greater utilization of this game fish.

INTRODUCTION

The range of the mountain whitefish (Coregonus williamsoni) includes the cold water streams and lakes on both sides of the Continental Divide from Alaska southward to the headwaters of the Colorado River. In Montana this whitefish is native in all three major drainages: Columbia, Missouri and Saskatchewan. Other game fish native in these waters are the cutthroat trout (Salmo clarkii) in all drainages, the American grayling (Thymallus signifer) in the headwaters of the Missouri drainage and the dolly varden (Salvelinus malma) in the Columbia drainage. Introductions of rainbow trout (Salmo gairdneri), brown trout (Salmo trutta) and eastern brook trout (Salvelinus fontinalis) have been made in most cold waters. Kokanee (Oncorhynchus nerka kennerlyi), lake trout (Cristivomer namaycush) and lake whitefish (Coregonus clupeaformis) have also been introduced into a few lakes containing mountain whitefish and other native species. Competition from these exotics, fishing pressure and conditions resulting from agricultural and industrial developments have greatly reduced the distribution and abundance of the cutthroat trout, dolly varden and American grayling. The mountain whitefish has been successful in coping with these changes and is probably the most abundant cold water game fish in Montana at the present time.

Although the mountain whitefish is gamey and has palatable flesh, it has been little utilized by most Montana fishermen who are primarily interested in trout. Inadequate utilization of this whitefish has also been reported in California (Dill and Shapavalov, 1939), in Utah (Sigler,

1951) and in Wyoming (Simon, 1946 and Eiserman, 1951). There is a growing interest in the mountain whitefish as a game and food fish in Montana (Brown, 1952). This is evidenced by a steady increase in the number of fishermen participating in the winter fishery. Winter fishing is primarily for mountain whitefish since regulations prohibit trout fishing except in a few streams where a daily limit may include one trout.

Because trout are still abundant enough to furnish good fishing, the mountain whitefish is often returned to the water or otherwise discarded. The inadequate harvest of this species has given it an advantage in competition with trout. Laakso (1951) reported some food competition between mountain whitefish and trout.

The present study was undertaken to encourage greater utilization of this fish by providing fishermen with information on: distribution and abundance, effective methods of capture and methods of preparation including skinning, filleting, smoking and cooking. In addition, an experiment was conducted testing the palatability of mountain whitefish as compared to trout.

Most Montana fishermen can readily identify the mountain whitefish but some do not recognize this fish. It is closely related to the trout but it is not likely to be confused with this group. It is usually misidentified as an American grayling (Thymallus signifer) or the common sucker (Catostomus sp.). It may also be confused with the lake whitefish (Coregonus clupeaformis), Columbia river chub (Mylocheilus caurinus) or the squawfish (Ptychocheilus oregonensis). The mountain whitefish can be

distinguished by the following characteristics: adipose fin, dorsal fin - 11 to 14 rays, a single fold of skin in the nostril, upper jaw projecting beyond the lower, the maxillary not reaching beyond a vertical line drawn from the anterior margin of the eye (Fig. 1).

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DISTRIBUTION AND ABUNDANCE

Information on the distribution and abundance of mountain whitefish in Montana was obtained from fisheries biologists, game wardens and fishermen. This fish is found in most of the cold water streams and lakes that drain the western half of the state. It is most abundant in the larger rivers and the lower portions of primary tributaries but is found less commonly in many of the secondary tributaries and headwater

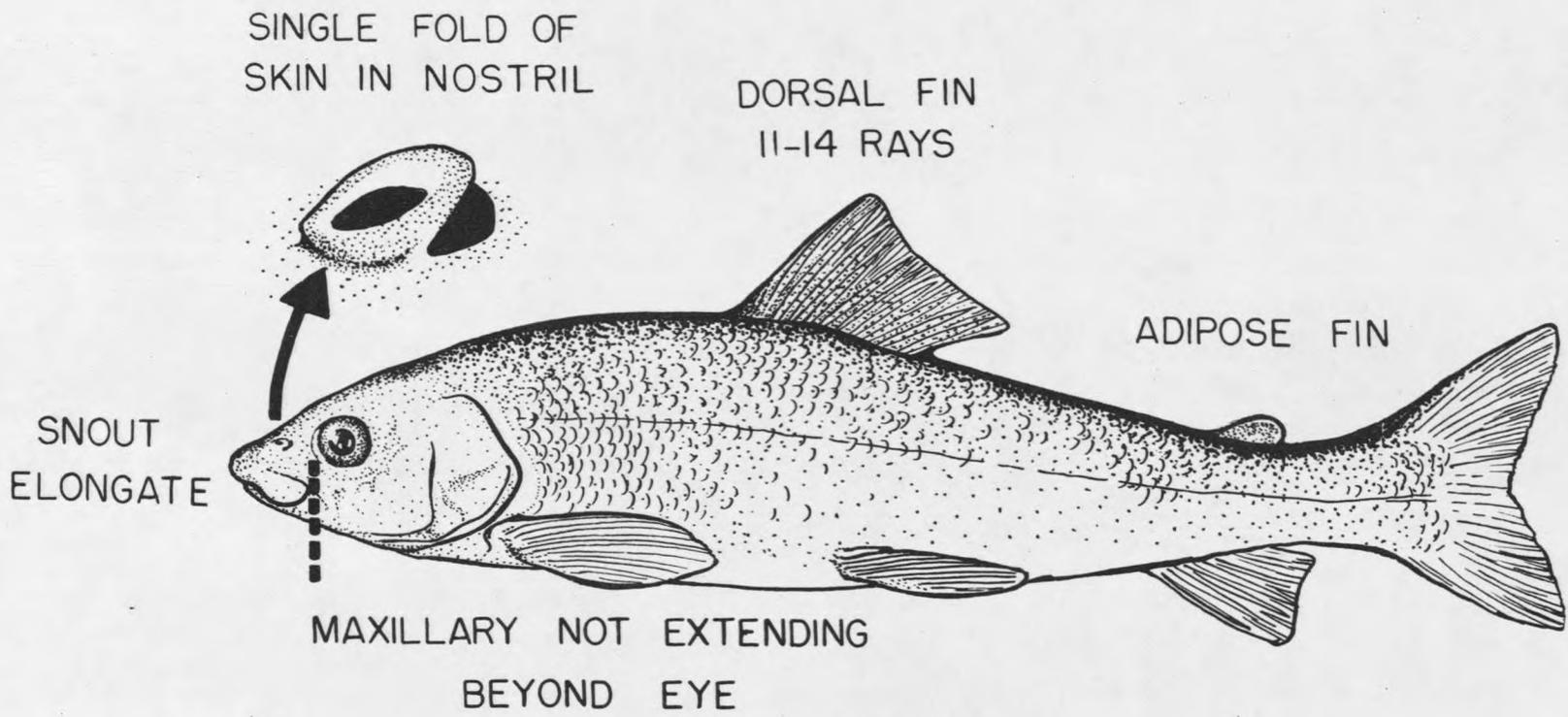


FIG. I CHARACTERISTICS OF THE MOUNTAIN WHITEFISH

streams. The distribution and abundance of this fish in the various waters of Montana is shown in Figure 2.

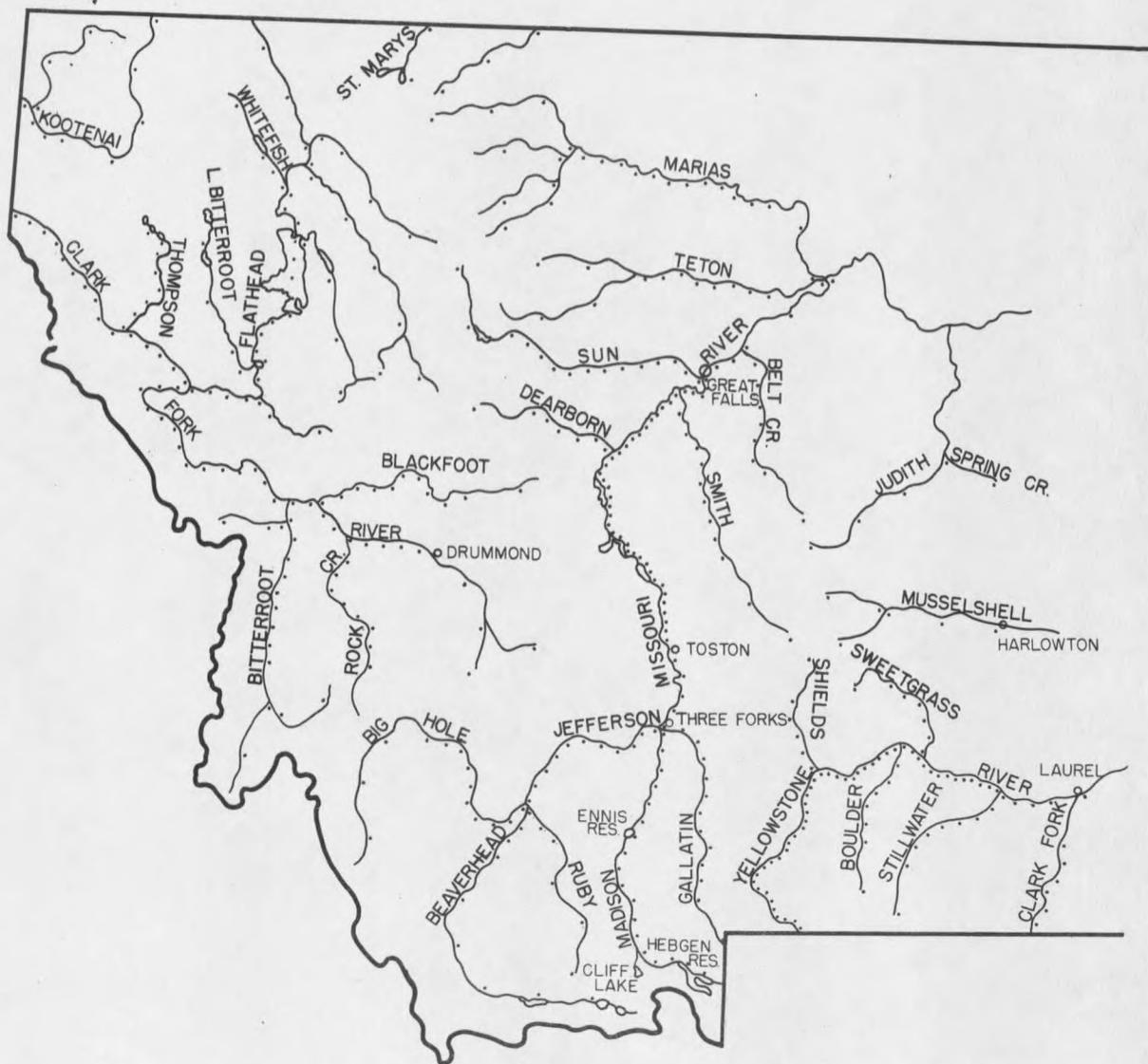
Missouri Drainage

The mountain whitefish is common in the Missouri River between Three Forks and Toston, abundant between Toston and Great Falls and has been reported as far downstream as the mouth of the Marias River. It is common in the Missouri River reservoirs above Great Falls and is also found in many tributaries of the Missouri.

The Yellowstone River is well known for the mountain whitefish it produces between Gardiner and Columbus. The 1950 creel census shows an average catch of about four fish per hour in this area. This whitefish is taken as far downstream as Laurel and occurs in the following tributaries: Clark Fork, Stillwater, Sweetgrass, Boulder and Shields. It is little utilized in these streams except the Clark Fork.

Creel census records show that whitefish are taken from the Musselshell River above Harlowton and from the Judith River above the Spring Creek tributary.

This fish is common in other Missouri River tributaries as follows: Marias River, Teton River, Belt Creek, Sun River, Smith River and Dearborn River but is little utilized in these streams. It is also common in the Gallatin River and its two main branches. Considerable numbers are present in the Madison River and its reservoirs. Mountain whitefish were introduced into Cliff Lake and have become very numerous. Abundant populations are present in the Jefferson River and the fish is common in the



LEGEND

- ABUNDANT.....
- COMMON.....
- FEW.....

FIG. 2. DISTRIBUTION AND ABUNDANCE OF MOUNTAIN WHITEFISH IN MONTANA

Big Hole, Ruby and Beaverhead tributaries.

Saskatchewan Drainage

The St. Mary's River also contains mountain whitefish but only about 20 miles of the stream occurs within the state. Fishing pressure is very light on this stream.

Columbia Drainage

The Kootenai River and its tributaries support moderate populations of whitefish but fishing pressure is negligible. This fish is common in the Clark Fork River above Drummond and abundant from there to the Idaho-Montana border. It is also found in all primary tributaries. It is common in the Thompson River and Thompson Lakes but is little utilized in these waters. It is present throughout the Flathead drainage but is most common in the Flathead River and Flathead Lake. The whitefish is abundant in the Bitterroot River and the Blackfoot River and is common in Rock Creek. These three streams receive most of the whitefishing pressure in that area.

METHODS OF CAPTURE

Information on effective methods of catching mountain whitefish was obtained by interviewing 414 fishermen. A total of 276 interviews were made during the winter while fishermen were engaged in whitefishing. Only three fishermen, of more than 100 interviewed, were actually attempting to catch this species during the summer. Mountain whitefish were taken by several of the trout fishermen interviewed but were usually

returned or otherwise discarded.

More than 300 hours were spent experimenting with various methods of taking whitefish by angling. The tackle and techniques employed were patterned after those used by successful fishermen. The following tackle and techniques are recommended because they were found to be most effective. However, the writer does not wish to imply that other methods are not successful.

Recommended Whitefish Tackle

A fly rod or spinning rod is satisfactory for stream fishing when the air temperature is above freezing but at lower temperatures ice forms in the guides and casting becomes difficult. At such times sectional or one-piece cane poles are more satisfactory. These are available in lengths up to about 20 feet. Ordinarily the pole selected should be the maximum length that can be conveniently handled. This permits the fisherman to reach better fishing areas without wading into deep water. Sectional poles are lighter and more limber than the one-piece poles and have the advantage of being easily transported.

The cane pole is equipped with a series of guides one-half inch or larger in diameter (Fig. 3). These guides do not fill with ice. If large guides cannot be purchased they can be made from any light weight stiff wire. An inexpensive single action reel taped to the base of the pole provides for the storage of line. A wooden bracket (Fig. 4) is a satisfactory substitute for the reel.

Nylon leader material is the most satisfactory line for winter use.

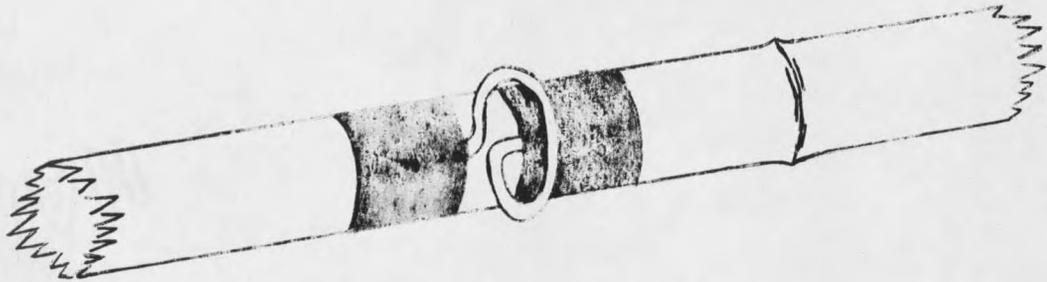


Fig. 3. Large guide used on cane pole.

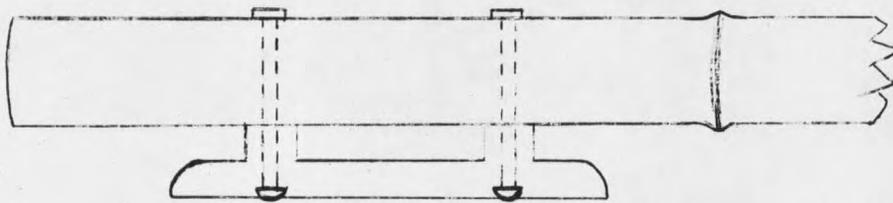


Fig. 4. Line-storage bracket on cane pole.

It does not absorb water like braided line and therefore does not "ice-up" so easily. It is often necessary to lift whitefish over the edge of shelf ice so the line should have a minimum breaking strength of about eight pounds. The use of nylon monofilament line eliminates the need for a leader.

Number 10 or 12 short-shanked hooks are most effective. Whitefish are occasionally taken on larger hooks and rarely on spoons or plugs but many strikes will be missed if large hooks are employed. A hook is tied to the end of the line and a number five or seven split-shot sinker is clamped on the line approximately six inches above the hook. If a second hook is used it is attached to a dropper loop 6 to 12 inches above the sinker.

A small cork or plastic float (one inch or less in diameter) is attached to the line above the other tackle. By regulating the position of the float the hooks can be kept close to the stream bottom without snagging on rocks and debris. Whitefish often strike so gently that it is not noticed, especially if there is some slack in the line. A small sensitive float will aid in recognizing these light strikes.

Fishing through the ice requires somewhat different equipment. A long cane pole is obviously unsatisfactory. Any short stiff rod or stick will serve the purpose but a fly rod tippet mounted in a wooden handle will furnish the most sport. Extra line is stored on a reel or wooden bracket secured to the handle. The line and tackle used on these rods is the same as that recommended for cane poles. A portable shack may be used for shelter where fishing is confined to lakes. A shack can be left

on the ice throughout the season and can easily be moved to desired fishing sites.

Whitefish Baits

Several kinds of bait are effective in taking whitefish. The type of bait used will depend upon availability and personal preference. Live baits are employed throughout the year but the type varies seasonally. Artificial flies are effective during the summer but are not recommended for winter use. The size of the bait is important since the whitefish has a small mouth.

Live bait: Immature aquatic insects are among the most effective whitefish baits known. These organisms are common in riffle areas of most cold clear streams where they cling to the underside of rocks. They can be secured throughout the year but are most numerous and of suitable size for bait in the winter and early spring. Many of these insects emerge during the late spring and summer and consequently will be less abundant following that period. They are most easily collected from rubble-strewn riffles covered by 6 to 18 inches of water.

A collecting device, made by nailing a section of window screen to two wooden handles, is held against the stream bottom at right angles to the current and rocks are overturned upstream (Fig. 6). Organisms are dislodged by the current and washed downstream into the screen.

Plecoptera or stonefly nymphs (Fig. 5), locally called hellgramites or scratchers, are the most preferred. These vary from mottled tan to dark brown or black in color and range up to two inches in length. The

