FISHERIES INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT ACTIONS FOR THE BOB MARSHALL WILDERNESS COMPLEX

Limits of Acceptable Change Management Plan

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The fisheries resource within the BMWC is extensive and unique. More than 500 miles of streams and 35 lakes support populations of native and introduced species of salmonids. Waters within the BMWC represent a genetic stronghold for two native fish species of special concern -- bull trout and westslope cutthroat -- and provide thousands of angler days of recreation.

Statewide creel surveys have estimated that the South Fork Flathead River alone supports from 5,000 to 12,000 angler days each year.

This report describes current fisheries management, biological indicators and standards, and further management actions that may be required to maintain those standards.

SOUTH FORK OF THE FLATHEAD RIVER

The South Fork of the Flathead River and Hungry Horse Reservoir support a high quality fishery for native species. Westslope cutthroat trout and bull trout support the majority of the sport fishery. Fisheries management direction in the drainage has emphasized a quality fishery with restrictive limits, rather than a high-harvest production fishery for those two Species of Special Concern. Large numbers of mountain whitefish inhabit the river and reservoir, but few anglers take advantage of this sport potential and food source.

Since more restrictive regulations were initiated in 1983, the average size of cutthroat in the population has increased in the South Fork Flathead River within the wilderness complex. Catch rates have increased, and density estimates appear to be good for an area noted for its clear, pristine, relatively nutrient-poor water. The current angling limits are three fish per day, none over 12 inches. This regulation allows cutthroat to reach maturity yet still provides anglers with fish to eat, an important part of the wilderness experience.

MDFWP and a group of concerned citizens have prepared a fisheries management plan for the entire South Fork drainage. The fishery should be managed consistent with this plan, forest plan guidelines, and wilderness principles.

Indicators and Standards

A monitoring program should be continued to track the response of the fishery to fishing pressure and regulations. Three sections of the South Fork should be included in the monitoring program: the Gordon section in the upper area, the Black Bear section in the lower middle area of the wilderness, and the Harrison section in the South Fork below the wilderness boundary. These three sections have been previously surveyed using the snorkel-Peterson method and would provide a good database for comparative purposes through the years. Also, these sections are representative of the three major fish habitat types found in the South Fork. An annual monitoring program on three sections of the South Fork would be ideal but cost-prohibitive due to the large amount of money and effort needed to survey the South Fork, especially in the wilderness complex.

A more realistic option would be to survey a representative reach in the middle section of the South Fork every other year (Black Bear Section), with a survey of all three sections every fifth year. This strategy would reduce costs considerably, yet still enable biologists to detect major differences in cutthroat population numbers, size of fish, and age/growth. Biologists should use the snorkel-Peterson method to estimate cutthroat trout densities.

The headwaters area (including lower Danaher and Youngs Creek and the first 1.5 miles of the South Fork) should be sampled annually as a baseline indicator site. The site has been sampled six consecutive years using the same methods. These data can be used to monitor yearly fluctuations in cutthroat catch rates and size distribution, information important in evaluating effects of angling regulations on the population.

We recommend the following standards for monitoring the health of the South Fork Flathead fishery. If monitoring data shows a 10 percent or more decrease from these standards, acceptable limits of impact are exceeded, and further management actions are required.

Fish Length and Catch Rate:

(a) Using hook and line capture and a sample size of 300 or more cutthroat, the following standards should be met in the Black Bear section (monitored every other year):

- average length: ≥ 9.0 inches
- percent ≥ 10 inches: 25 percent
- percent ≥ 12 inches: 10 percent

(b) Using hook and line capture and a sample size of 100 or more cutthroat, the following standards should be met in the Headwaters section:

- average length: ≥ 10.0 inches
- percent ≥ 10 inches: 40 percent
- percent ≥ 12 inches: 15 percent

These fish should be caught at a rate exceeding 6.0 fish per hour under good angling conditions.

If annual monitoring data shows a 10 percent or more decrease from these standards, acceptable limits of impact are exceeded, and further management actions are required.

Fish Population Numbers: Using the snorkel-Peterson method, the following standards should be met in the Black Bear section in alternate years:

- Total cutthroat population: 450 fish per km
- Number > 10 inches: 90 per km
- Number ≥ 12 inches: 40 per km

Creel Card Angler Survey: Results from periodic angler survey (every second or third year) should indicate greater than 25 percent of cutthroat caught exceed 12 inches (estimated lengths of fish by anglers always exceed MDFWP estimates). Also, catch rates for cutthroat should exceed 2.5 fish per hour.

Age and Growth: Calculated growth of westslope cutthroat captured in the Black Bear and Headwaters sections should exceed 245 mm (9.6 in) at age IV. Sample size should exceed 50 fish.

Potential Management Actions

If decreases below these standards are noted, agencies should implement further management actions. Potential management actions for the South Fork fishery include:

1. Restrict the use of bait on the South Fork Flathead River.
2. Require barbless hooks, artificial lures only.
3. Reduce the angling bag limit to one or two fish.
4. Implement an educational program on regulations and catch and release techniques.
5. Increase enforcement of regulations through cooperative agency efforts.
6. Regulate the number of float-anglers or total anglers on the river.
7. Impose a catch and release angling regulation on all or a portion of the South Fork within the BMWC.

MIDDLE FORK OF THE FLATHEAD RIVER

The major sport fish (numerically) in the Middle Fork Flathead River and its tributaries within the BMWC is the westslope cutthroat. Westslope cutthroat are a species of special concern, and have been shown to be highly susceptible to angler harvest. Therefore, we recommend maintaining the current stream fishery limits of three fish, none over 12 inches (305 mm) in the Middle Fork drainage within the BMWC.

Cutthroat trout inhabit all of the 12 mountain lakes in the Middle Fork drainage within the BMWC. Six of these lakes are planted with cutthroat regularly; in six of the lakes, populations are maintained through natural reproduction. The present lake fishing limit of three fish, no size restrictions, appears to allow for a reasonable harvest while maintaining an adequate population size. Almeda and Dickey lakes harbor pure westslope cutthroat from the new brood stock. These lakes are difficult to access because of primitive trail conditions. To protect these stocks and provide a varied angling experience, trail maintenance into this area should be halted.

Bull trout provide an important trophy fishery in the Middle Fork Flathead River and some of its tributaries (e.g., Schafer and Dolly Varden creeks). Anglers are willing to expend eight hours or more to catch a single mature bull trout. Based on our spawning site surveys, the number of bull trout spawning sites (redds) in the drainage has been relatively stable. Apparently, the current fishing limit of one fish daily and in possession is affording adequate protection for the spawning adults.

The Middle Fork drainage is unique within the BMWC in that the upper portions of certain tributary drainages are undergoing timber harvest near the BMWC boundary. Stream habitat degradation from this activity is extending downstream within the BMWC. Man-caused habitat degradation is contrary to the concept of wilderness protection, and should be discontinued. Therefore, we recommend no further road construction, timber harvest, or other activities that cause pollution in tributaries that flow into the BMWC. To be consistent with the wilderness act, which the U.S. Forest Service administers, timber and road activities should be halted and no further work planned in the following drainages: Morrison, Granite (includes Challenge and Dodge) and Twenty-five Mile.

Trail construction improvements and location also could have a negative impact on the fishery in the Middle Fork drainage within the BMWC. Trail locations should be examined carefully along tributary reaches important for bull trout spawning (see maps in Appendix Report), where large, mature bull trout spawners are vulnerable and very sensitive to disturbance. Specifically, Trail Creek supports a large number of bull trout spawners, and the existing trail has a history of limited maintenance. To reduce access and disturbance to this concentrated spawning area, we recommend halting all trail maintenance in the drainage.

Increased access to westslope cutthroat rearing areas could encourage overharvest of fish in important nursery areas. Basin Creek (above its junction with Bowl Creek) is a critical rearing area for cutthroat and the trail along its length has a history of low maintenance. To reduce access to this cutthroat rearing area, we recommend discontinuing all trail maintenance in the Basin Creek drainage above Bowl Creek.

Indicators and Standards

We recommend the following standards for monitoring the health of the Middle Fork fishery. If monitoring data shows a 10 percent or more decrease from these standards, acceptable limits of impact are exceeded and further management actions are required.

Cutthroat Population Numbers: Using the snorkel-Peterson method, the following standards should be met in the Gooseberry section (Gooseberry Cabin to Clack Creek) in alternate years:

- Total cutthroat population: 250 fish

These numbers may have to be adjusted as more estimates are completed in normal water years.

Cutthroat Length and Catch Rate: Using hook and line capture and a sample size of 75 or more cutthroat, the following standards should be met in the Gooseberry section:

- Average length: ≥ 8.0 inches
- Catch rate: ≥ 3 fish per hour under good conditions
- Percent ≥ 10 inches: 10 percent

Creel Card Angler Survey: Results from periodic angler surveys (every second or third year) should indicate greater than 10 percent of cutthroat caught exceed 12 inches (estimated lengths of fish by anglers always exceed MDFWP estimates). Catch rates of cutthroat trout should exceed 0.8 fish per hour.

Survey of Bull Trout Spawning Sites: Bull trout populations are very sensitive to disturbance both within and outside the BMWC boundary. Bull trout which spawn in the Middle Fork drainage within the BMWC migrate a minimum of 150 km. They are exposed to angling in Flathead Lake and in the Flathead River system along the length of their migration route. To monitor spawning success, bull trout redds should be counted each year in selected tributaries within the BMWC (Table 1). Trends in the number of redds in each tributary should be closely followed and compared to counts outside the BMWC in other portions of the Flathead Basin. Counts should be no less than 20 percent below the average figure for the drainage.

MDFWP should continue to measure streambed conditions on Granite Creek just upstream of the wilderness boundary to monitor sediment pollution entering the BMWC from timber activities upstream. Sediment conditions in this reach (44 percent fine sediments in the streambed in 1987) are among the highest measured in the entire Flathead drainage.

Electrofishing estimates of juvenile bull trout and cutthroat trout in Morrison and Challenge creeks outside the wilderness boundary should be continued as they reflect population levels of progeny of adult fish which migrated upstream from the BMWC to spawn.

Mountain Lakes

To build a better data base for managing cutthroat in mountain lakes in the drainage, we recommend a survey of two lakes per year by gill net and/or hook and line for size, genetics, and age/growth determination. Initially, we recommend survey of Stanton Lake and Tranquil Lakes (2). Stanton is an easy-access lake (1.5 miles, trail) with relatively heavy fishing pressure and small cutthroat. The Tranquil Lakes are difficult to reach, support lighter fishing pressure, and contain larger cutthroat. Cutthroat populations are maintained naturally in both Stanton and the Tranquil Lakes, but genetic make up of the fish is unknown. If funds are available, it would be desirable to collect fish from the two lakes for genetic testing. The remaining nine lakes in the drainage with fish populations could be surveyed as funds allowed, preferably two lakes per year.

Table 1. Bull trout redd counts for selected areas of tributaries chosen for monitoring in the Middle Fork Flathead drainage.

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Mean
Granite[a/]	25.[b/]	75	32.[b/]	86	67	38	99	52	49	50	63	58
Lodgepole	14	34	14.[b/]	34	31	47	24	37	34	32	31	30
Schafer	15	10	12	17	18	--	--	30	30	14	15	18
Dolly V.	20	21	31	36	53	--	--	42	51	46	56	40
Ole[c/]	--	19	19	51	35	26	30	36	45	59	21	34
Mean Total												205

[a/] Portions of the section counted are outside the BMWC.
[b/] Incomplete survey, counts probably low.
[c/] Glacier National Park

Potential Management Actions

If decreases below these standards are noted, agencies should implement further management actions. Potential management actions for westslope cutthroat are included under the South Fork section. If declines are detected in the number of bull trout spawning in the drainage steps should be taken to increase protection of the spawning run. Options for increased protection include:

(1) Restrict angling on Dolly Varden and Schafer creeks. These streams are important for bull trout spawning and are easily reached across from Schafer Meadows Guard Station (which is accessible by air).

(2) Restrict angling on all major spawning streams within the BMWC (Dolly Varden, Schafer, Clack, Strawberry, Bowl and Trail). Granite, Morrison, Long and Charlie creeks are already closed to angling.

(3) Restrict the season length for bull trout fishing in the river and/or tributaries.

(4) Close the river and/or tributaries to all taking of bull trout.

Adequate enforcement of angling regulations is difficult in the Middle Fork drainage within the BMWC. However, there are several steps which could be taken to improve compliance. First, prominent signs summarizing current regulations should be maintained at all trailheads. Second, personnel of the MDFWP and USFS could increase the frequency of joint enforcement patrols. Finally, a system similar to TIPMONT could be encouraged within the BMWC to reduce the illegal harvest of bull trout from streams in which they spawn. "Snagging" of bull trout in shallow spawning streams was the illegal fishing activity most frequently heard by biologists working in the drainage within the BMWC.

BLACKFOOT RIVER

The Blackfoot River drainage waters have received a significant number of cutthroat fish plants of unknown genetic make-up. We recommend that fish surveys in these drainages should include genetic evaluations to determine if the native westslope cutthroat trout stocks have been altered and how much.

The greatest need in the Blackfoot drainage is a biological database from which informed management decisions can be made. We recommend a three to five year baseline study with a full-time three-person crew (a biologist and two technicians) and adequate equipment and travel. No monitoring standards can be proposed at this time because of insufficient information.

To begin building a fisheries database for management decisions, we suggest a cooperative effort between FWP Regions 1 and 2 to sample a 1.5-km section of the North Fork Blackfoot River within the BMWC. This sampling would include hook- and-line methods to tag fish and collect scales for age and growth, followed by a snorkel survey to estimate cutthroat population densities.

Other options include: (1) no further improvements on the Bighorn Lake trail, to protect the naturally reproducing cutthroat population there, (2) no trail construction to access Little Crystal lakes, and (3) planting Little Crystal lakes with westslope cutthroat trout.

EAST FRONT DRAINAGE

Streams draining the East Front within the BMWC support an important fishery for rainbow, cutthroat and eastern brook trout. Lack of information on the fishery limits the effective management of this resource. We recommend a three year baseline study on fisheries and stream habitat on the East Front drainages within the BMWC to collect information necessary for building a database for sound management. The genetic purity of cutthroat populations within the drainages is unknown. We recommend genetic testing in North and South Fork Sun River Drainage tributaries where cutthroat populations exist, and in the Teton River, Birch Creek, Dupuyer Creek and Dearborn River drainages.

Indicators and Standards

Rainbow and cutthroat population numbers: Using the snorkel-Peterson method, the following standards should be met in the South Fork of the Sun River from Windfal Creek to Bean Creek (1.06 miles).

- Total rainbow and cutthroat population: 900 fish

Rainbow and cutthroat lengths and catch rates: Using hook and line capture, and a sample of 100 or more fish, the following standards should be met in the South Fork Sun River:

- Average length: ≥ 11 inches
- Percent ≥12": 30 percent

On the north fork Sun River:

- Average length: ≥ 10 inches
- Percent ≥12": 20 percent

Creel Card Angler Survey: Results from periodic angler survey (every second or third year) should indicate greater than 20 percent of trout caught exceed 12"; rainbow trout should be caught at rates exceeding 2.0 fish per hour.

Potential Management actions

If decreases of 10 percent of more below these standards are noted, potential management actions listed under the South Fork section could be implemented. However, agencies could consider actually increasing limits on rainbow trout in the drainage to encourage recreation on this non-native species.

OVERALL MANAGEMENT RECOMMENDATIONS

Presently, fisheries management within the BMWC is based on general guidelines agreed upon in 1979 by the MDFWP director and the regional forester for Region 1, USFS. Fisheries managers in MDFWP Regions 1, 2 and 4 cooperate with district rangers to formulate local management actions. MDFWP and USFS will reexamine the memorandum of understanding between the two agencies, and update the document in light of new information and the results of this L.A.C. process. Strategies should be clarified and reaffirmed for the following:

1. Techniques of fish population sampling (rotenone, motorized electrofishing).

2. Chemical rehabilitation of lakes.

3. Fish planting (native vs. non-native species, endangered or threatened species, barren lakes, aerial planting).

4. Cooperative fish population monitoring.

5. Angling/recreation philosophy (harvest vs. population maintenance, angling and floating restrictions, angler access).

6. Habitat protection (trail construction within the BMWC, land use outside the BMWC that affects waters within the BMWC).

7. Management of fish species such as cutthroat and bull trout which migrate into and out of the BMWC.

8. Enforcement of angling regulations.

9. Consideration of a cooperative fisheries biologist position for the BMWC.

The valuable fisheries resource within the BMWC will be benefited by comprehensive, consistent fisheries management that recognizes the balance between maintaining the integrity of fish populations and providing angling recreation. Management should be consistent with existing fisheries management plans (i.e., South Fork Flathead). We recommend formation of a fisheries management committee for the BMWC which would consist of the MDFWP fisheries managers, representatives of the four national forests within the BMWC, and designated public participants. This committee could formulate a detailed management plan, and recommend adaptive fisheries management policies for review by the MDFWP Director and regional forester.