Classifying Montana's Fishing Streams

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INTRODUCTION

Montana has long boasted of 20,000 miles of fishing streams. As the years go by the boast attracts less and less attention simply because so many other states also claim 20,000 miles of fishing streams! Neither the basis of the estimate nor its accuracy is being questioned, but let's pause for a minute and consider some questions that become more pressing every day. What is the over-all effect of other water uses on Montana's fishery resource? What is the significance of lopping off 10, 20, and 30 miles of fishing streams per year? Where is our fishing located? Just how good is it? How much of it do we have? Until we know what we've got to work with, that is, until we inventory and classify fishing waters, these questions will go largely unanswered. Fishery conservationists have wailed long and loud over the "tag along" position they occupy in planning for new and additional uses of our waters. There is little prospect for improving fishery's position in comprehensive planning until we do what other water interests have been doing all along. That is, to inventory and classify our waters from the standpoint of recreational fishing. Such an inventory must be designed so as to establish the relative positions of all streams classified, and the expected contribution of each to the recreational fishery resource of the state.

Much thought and effort has been given to this task over the years in Montana. Much data have been gathered, and much more is available. The major difficulty has been to devise a system of appraisal that would be simple enough for practical application, broad enough to include all factors contributing to a stream's worth as a fishing stream, and capable of being portrayed in an understandable manner.

More recently a committee composed of personnel of the Montana State Fish and Game Department, Montana State College, and Missouri River Basin Studies has explored the various possibilities and has developed jointly the method outlined below.

METHOD

The following method of stream classification is based on a rating of four factors in terms of existing and expected conditions followed by the consideration of these factor ratings in determining classification.

The factors are: (1) availability to fishermen, (2) esthetics, (3) use, and (4) productivity. For purposes of this discussion the words "factor", "rating", "class", and "stream" are defined as follows:

Factors are the four major headings, esthetics, availability, use and productivity, each of which is to be rated on a judgment appraisal of potential quality.

Factor ratings are the actual letters, a, b, c, etc., assigned to each factor.

Class is the final classification based on a judgment appraisal of the relative significance of each of the four "Factors".

Stream - any course of flowing water regardless of size, but important as a source of recreational fishing.

Consideration of intangible as well as tangible data has necessitated a method based on a series of judgment appraisals. Accordingly, factor ratings have been broadly outlined in the following pages in order that they might serve as a guide towards standardization of appraisal.

Availability

Primary Considerations

- Roads - type, condition, proximity to stream, and vehicular access to stream banks.
- Stream access in terms of posting and availability to use, natural factors such as brush, marshes, canyons, and mud flats which might limit access.
- Lodging and campsites - number, cost and convenience.
- Location in reference to centers of human population.

(a) Good hard surface all-weather roads adjoin the entire stream and vehicular access to stream banks is possible at many places. The stream usually lies less than 1/4 mile from highway.

Good public campsites are available. Cars may be driven to stream bank at many places. Stream banks offer good sites for bank fishermen. Most of the land in this type of area

probably is publicly owned. If, however, the land is privately owned, fishermen are never denied convenient access to the stream.

Immediate lodging facilities at reasonable rates are common. Streams in this category usually are located very near centers of population, thereby permitting use by many people with a minimum of travel.

(b) Stream availability similar to (a) above particularly as to the presence of good all-weather roads and land open to public access. One or two of the other features, however, would be unsatisfactory. For example, lodging facilities and campsites near the stream might not be adequate, or it might not be possible to drive vehicles close to the water, or stream morphometry might be such that mud flats, high banks, or treacherous currents deter some anglers, particularly children, women, and elderly people.

Streams in this category usually are located within 50 miles of major towns or other centers of population.

(c) Satisfactory road access to within 1/4 mile of most of the stream, but roads may be impassable during wet weather or blocked by snow for short periods during the fishing season.

Stream access is generally better than average but some portions of stream may be difficult of access due to natural conditions or due to posting.

Lodging or camping facilities may be limited in number or may be expensive.

In the western part of the Missouri River Basin, streams in this category usually are located within 50 to 100 miles of major centers of population.

(d) Good roads or highways generally do not approach within 4 or 5 miles of the stream. The access roads which do approach the stream generally are in poor condition, passable only by jeeps, pickups, and other high-center vehicles. In some cases, vehicular access may not be possible within 2 or 3 miles of the stream but good foot trails bring the area within a reasonable hiking distance for the more active anglers.

Many streams along good roads also would fall in this category if posting has made large areas inaccessible.

Natural conditions such as swamps, canyons, and possibly dense stands of stream-side brush may result in a (d) rating when they restrict fishing to only a few sites.

Lodging facilities are almost nonexistent.

Streams in this category usually are located at a distance of over 100 miles from major centers of population. Many streams fall into this category - particularly as a result of posting.

(e) Access only by pack trip, with no vehicular travel possible. Access also may be severely restricted by stream location in a precipitous canyon or by other natural barriers.

Streams in this category usually are not located near population centers.

(f) Complete posting prohibits entry of general public.

Esthetics

Primary Considerations

- Naturalness - including wilderness qualities.
- Beauty - attractiveness of surroundings, particularly unique types of beauty.
- Usableness - climate and biological factors (pests).

(a) A stream of outstanding natural beauty usually of a unique type and possessing wilderness characteristics. Streams usually clean and clear. Climatic characteristics such as to add to the pleasure of fishing.

(b) A stream comparable to (a) above except that it usually lacks wilderness characteristics. Presence of a few human developments such as roads, farms, or commercial establishments usually would comprise the chief differences between (a) and (b). This type of stream usually has high use by tourists.

In some cases, however, the limiting consideration might be climatic or biological. Excessive rainfall, extreme cold or insect pests might be so bothersome as to limit esthetic value.

(c) A stream of considerable natural beauty but of a more common type than listed under (a) and (b). Clean and usually

clear streams flowing through attractive agricultural areas or rough lands with picturesque scenery. This type of stream often is favored by tourists.

(d) An area with average scenic or esthetic qualities. This type of stream is fairly common and has some attraction for nonresident tourists. The waters are clean, the scenery is appealing. The land is not abused. The area, however, lacks what usually are considered unusual or outstanding scenic qualities.

(e) A stream with fair esthetic qualities. Water is often turbid. The surrounding country has only mediocre scenic appeal and is of common occurrence. The area generally would not be considered attractive to tourists but it may attract many people from surrounding regions where streams are scarce. A lack of stream-side cover often is apparent. Mud banks are common and stream flows occasionally may become so low as to expose extensive expanses of mud flats and sand bars.

(f) A stream lacking in esthetic and scenic characteristics. Waters are usually turbid, low flows are common, exposing mud flats and mud banks. Obnoxious domestic and industrial wastes may occur. Stream-side cover often is lacking. This type of stream's primary esthetic appeal usually lies in the fact that although it may not be attractive, it does offer local people an opportunity to get outdoors near some water. Use is mainly local.

A stream which is an eyesore, usually as a result of human negligence. Industrial and domestic wastes are apparent. The stream is obnoxiously polluted or dewatered. Garbage and junk often are in evidence. Industrial sites and poor-class housing often line the stream banks.

Use

Expected number of fisherman days annually per mile of stream:

factor ratings		examples
(a)	Over 1000	Missouri River, Cascade to Holter Dam.
(b)	500 - 1000	Blackfoot River, mouth to Nevada Creek.
(c)	250 - 500	Sixteen Mile Creek above Josephines
(d)	100 - 250	Red Rock Creek (above lake)
(e)	Under 100	Clark Fork Columbia River, Bonner to Bonita R. S.

Productivity

Present biological and morphological qualities of the stream which determine its natural capacity to produce recreational fishes.

Primary Considerations

- Stream size - in terms of width rather than flow.
- Morphometry - interspersion of pools and riffles, gradient, and barriers to fish migration.
- Cover - depth, boulders, undercut banks, vegetation.
- Spawning sites for useful fishes.
- Fish food - production of plankton, insects and crustaceans.
- Water quality - fertility, temperature and pollutants.

(a) A large stream (river) of outstanding qualities approaching the ideal in capacity to produce useful fishes. Exceeds the top rating of most states.

(b) A high quality stream which is well above average in most qualities. Sometime restricted in biological capacity because of more moderate size. Hardly a common type even in Montana.

(c) A good quality stream - many streams will be placed in this category.

(d) A stream which is definitely below average in biological and morphological qualities - a poor fish producer.

(e) A very poor quality stream with little capacity to produce useful recreational fishes.

(Much difficulty was encountered under the "productivity" heading because there seemed to be no way to use a per acre basis. On a per acre basis the rating for some small streams would be very high while on a per mile basis these same productive little streams would be low. Since one of the main objectives for a classification is defense of streams being considered for dams or industrial use, there is merit in rating productivity on a per acre basis. More consideration needs to be given this matter.)

APPLICATION

There is no formula, chart, or graph that will permit a satisfactory inventory of recreational fishing streams without an

extensive knowledge of field conditions. Measurement of stream fisheries such as we are striving for in Montana involves considerations ranging from local to national levels. All water uses, all benefits, and the interest of all the people are fundamental.

To date the Committee has devoted all its efforts to devising a usable method for classifying the streams. We now propose to apply the method presented in this paper in the field and complete the classification of Montana streams and prepare a report by the end of this calendar year.

To illustrate how we expect to apply the scheme, the writer has applied it to the following streams. This is a preliminary classification only since it is subject to the review and approval of the entire committee.

A Tentative
Classification of Montana Streams According to Their Worth
for Recreational Fishing

MAIN STEM of MISSOURI and TRIBUTARIES (Part 1 of 5)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
Missouri R. from N. D. line to Ft. Peck Dam	189	e	e	e	d	5	
Ft. Peck Reservoir (Max. pool)							
Musselshell River below Ryegate	215	d	e	e	e	5	No flow in drouth years.
Musselshell R. from Ryegate to Harlowton	37	e	d	e	d	5	No flow in drouth years.
Musselshell R. from Harlowton to Durand Dam	40	d	c	c	b	3	Extensive diversions.
South Fk. Musselshell R. above Martinsdale	10	c	d	c	d	4	
Missouri R. from Ft. Peck Res. to Morony Dam	180	e	c	e	e	5	Remote. No access winter or during wet weather.
Judith R. from Hobson to junction of forks	30	c	c	b	b	3	
Big Spring Creek (Lewistown)	20	b	d	b	a	2	Best trout fishing this far east and north in Mont.
Missouri River from Morony Dam to Ulm	46	c	f	e	e	5	
Smith River from mouth to Newlan Creek	100	e	b	e	a	3	Would be class 1 with free access.
Smith River from Newlan Creek to forks	13	f	b	e	c	5	
Sheep Creek	10					4	
Sun River from Vaughn to jct.of N.Fk. & S.Fk.	47	e	d	e	d	5	
N. Fk. Sun R. from mouth to Tepee Rings	20	e	c	e	d	5	

MAIN STEM of MISSOURI and TRIBUTARIES (Continued)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
N.Fk.Sun R. from Tepee Rings to Diversion Dam	6	e	c	e	d	5	
S. Fk. of N. Fk. of Sun R. above mouth	15	d	b	d	c	3	Accessible at both ends.
N. Fk. of N. Fk. of Sun R. above mouth	20	e	a	e	c	3	A wild river.
Missouri River from Ulm to Cascade	36	b	d	d	c	4	Better fishing nearby hol class down.
Missouri River from Cascade to Holter Dam	26	a	c	a	a	1	Equal to Madison, larger and year long fishing.
Little Prickly Pear Creek	24					4	
Dearborn River from mouth to S. Fork	20	d	c	d	a	2	Excellent fishing - acces poor, rattlesnakes thick
Dearborn River above S. Fork	30	e	b	d	c	3	
Missouri R. from Townsend to Toston Dam	19	a	d	a	a	1	Exceeds Madison, is much larger, and is open all year.
Missouri R. from Lombard to head of river	18	f	e	d	d	5	
Sixteen Mile Creek below Josephine's	18	e	e	e	d	5	Extensive diversions and rattlesnakes
Sixteen Mile Creek above Josephine's	12	e	b	d	a	3	Excellent fishing, access poor and rattlesnakes thick.

THE THREE FORKS and TRIBUTARIES (Part 2 of 5)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
Gallatin R. from mouth to Jct.of E. & W. Gal. R.	11	d	d	c	a	3	Big potential.
East Gallatin River in its entirety	24	e	c	c	b	3	
West Gallatin R. from mouth to Yellowstone N.P.	74	a	a	b	b	2	(Should be divided in 2 pieces.)
Madison R. from mouth to Hot Springs Creek	25	b	d	d	a	2	
Madison R. from Hot Springs Cr. to Hebgen Dam	78	a	b	a	a	1	Nationally recognized.
Jefferson River from mouth to Sappington	18	d	d	d	d	4	Better fishing nearby hold class to 4.
Jefferson R. above Sappington to head of river	46	c	d	c	b	3	Very important winter fishing.
Beaverhead River from mouth to Dillon	31	c	c	c	c	3	
Ruby River from mouth to Ruby Dam	30	c	c	c	c	3	
Ruby River above Ruby Reservoir	25	e	b	d	c	3	
Beaverhead R. from Dillon to head of river	31	c	c	b	a	2	Despite extensive irrigati fishing is excellent.
Blacktail Creek above P. & O. Headquarters	15	e	c	d	c	4	Strict posting, small stream.
Red Rock River from mouth to Dell	20	c	c	c	c	3	Extensive diversions.
Big Sheep Cr. from Ranger Station to forks	10	c	b	b	c	3	
Red Rock River from Dell to Lima Dam	20	d	d	d	c	4	Turbid flows in summer. Often snowed in in winte
Odell Creek	10	e	b	e	d	4	Good greyling. Brush and moose hurt access.
Red Rock Creek	15	e	b	c	d	4	

THE THREE FORKS and TRIBUTARIES (Continued)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
Elk Springs Creek	5	e	c	e	c	4	
Horse Prairie Cr. from mouth to Black Canyon Creek	20	d	c	d	c	4	Much posting and brush.
Big Hole R. from mouth to Pintlar Creek	78	b	b	a	a	1	Similar to Madison, smalle but year long fishing.
Wise River	22	c	b	d	e	4	
Big Hole R. from Pintlar Cr. to Jackson	33	c	b	c	b	2	

THE YELLOWSTONE and TRIBUTARIES (Part 3 of 5)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
Yellowstone R. Mont. from N.D. line to Pompey's Pillar	294	d	e	e	e	5	
Yellowstone R. from Laurel to Big Timber	72	c	c	a	b	2	Big river, yr.long fishing.
Clark Fork from Edgar to state line	53	d	e	e	d	5	Turbid from irrig. returns.
Rock Creek from mouth to Fox	40	c	d	c	b	3	Extensive diversions.
Stillwater R. in its entirety	70	c	d	a	b	2	Considerable posting.
East Rosebud in its entirety	36	c	c	c	c	3	
West Rosebud in its entirety	30	c	c	c	c	3	
Boulder River from mouth upstream(Big Timber)	36	b	c	b	c	3	Much posting lower 15 mi.
West Fork Boulder	20	c	b	d	b	3	
Yellowstone R.from Big Timber to Yellowstone N.P.	103	a	a	b	a	1	Huge potential & yr. long fishing.
Shields R. from mouth to Cottonwood Creek	18	c	e	d	c	4	High in productivity but diversions keep stream small.

THE CLARK FORK OF COLUMBIA & TRIBUTARIES (Part 4 of 5)	River Miles	Factor Rating: Avail.	Esth.	Use	Prod.	Stream Class	Remarks
Clark Fk.of Columbia fr. Trout Cr.to Flathead R.	61	d	a	e	d	3	
Thompson R. from mouth to Bend Guard Station	30					3	
Clark Fork of Columbia fr.Flathead R.to Bonner Dam	120	d	a	d	c	3	
Flathead R. from mouth to Kerr Dam	73	d	c	d	c	3	
Jocko R. from mouth to lower lake	35	d	c	c	c	3	
Flathead R. fr. Flathead F. to jct. of N. & Middle Forks	45	a	a	b	b	1	Big stream - big potential.
N. Fork Flathead mouth to intnl. bndry.	61	b	a	d	d	2	
Middle Fork Flathead mouth to Nimrod	46	b	a	e	d	2	
Middle Fork Flathead R. Nimrod to Cox Cr.	30	e	a	e	c	1	A wild, primitive river.
South Fk. Flathead, head of Hungry Horse Res. to Danaher Creek	46	c	b	e	b	2	A wild river, good Ct.
Swan River fr. Swan Lake to head of river	34	d	a	d	c	2	
Bitteroot R. mouth to Connor	80	c	c	c	a	2	
Clark Fork Columbia R. fr.Bonner Dam to BonitaR.S.	19	d	c	e	e	5	Barely supports trout drifting in from tribs.
Blackfoot R. from mouth to Nevada Cr.	64	a	c	c	b	2	
Clearwater R. from mouth to Rainy L.	20	d	a	d	b	3	Excellent Ct., brush & posting.
North Fk. Blackfoot R. in its entirety	24	e	a	d	c	3	
Little Blackfoot R. fr. mouth to Elliston	25	b	c	c	b	3	Extensive diversions.
Rock Cr. from mouth to West Fork	50	b	b	b	b	2	

THE KOOTENAI and TRIBUTARIES (Part 5 of 5)	River Miles	Factor Rating: Avail.	Esth. Use	Prod.	Stream Class	Remarks
Kootenai R. from Mont.-Ida. line to International Boundry	100				3	(4
Yaak R. from mouth to West Fork	39	d	a	d c	2	(5

RECAP

Class	No. of streams	River Mi.
1	7	379
2	16	765
3	30	1100
4	14	236
5	19	2299
Totals	86	4779

CONCLUSIONS

It should be noted that no stream is likely to receive a maximum rating (a) in all factors. This is true because high ratings ordinarily are mutually exclusive. For example: a maximum rating in Use or Availability probably would preclude a maximum rating in esthetics.

This situation, however, does not preclude the classification of a stream at the maximum or as a Class I stream. Streams may be assigned to a given class for several reasons. For example, either a combination of generally good factor ratings or a maximum rating in one factor could be sufficient justification to place a stream in Class I.

In a broad system of stream classification, particularly when judgment appraisal must serve as the basis, it is almost impossible to explicitly define all considerations.

Accordingly, the factor definitions do overlap and are not strictly definitive. Furthermore, classification of streams by the method outlined herewith will not necessarily result in agreement among individuals.

The method, nevertheless, has certain values. These values lie primarily in the fact that the method serve to identify the major factors which must be considered in classification of streams, and identifies specific differences in judgment among individual appraisers. As a result it may be possible to form a common basis for our thinking

and provide a more tangible approach to stream classification. An inventory and appraisal of the fishing potentialities of Montana streams would constitute an important step in the direction of long range planning for conservation of the resource and at the same time a long overdue contribution to comprehensive planning. We could graduate from our "back row" position to one where we would have our feet under the table in planning for the best use of our waters.