THE ECONOMIC VALUE OF INSTREAM FLOWS

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State Water Plan

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I. EXISTING DATA IN MONTANA

1. A recent study by Duffield and Loomis estimates that the economic value of cold-water stream fishing in Montana is $122 million, and the economic value of lake fishing is $93 million. These figures represent the gross annual value of the existing resource, and do not reflect the value of an incremental increase in either instream flows or recreation visitor days. (See attached summary for explanation).

2. A study by the Sport Fishing Institute estimates that $193,609,766 were spent in Montana for fishing in 1985. Nearly 5,000 jobs were also created by the fishing industry. (See attached summary for comparison of Montana with other states).

II. ONGOING STUDIES IN MONTANA

1. To date, there are no data available on the economic value of an acre-foot of water for instream use in Montana. However, several ongoing studies are designed to answer this question.

2. The Montana Department of Natural Resources and Conservation has contracted with Dr. John Duffield to estimate the economic value of an acre-foot of water for instream use in the Missouri River basin. This study is expected to be complete July, 1990.

3. The Montana Water Resources Research Center is funding research (once again being conducted under the auspices of Dr. John Duffield) to estimate the economic value of instream flows on 19 blue-ribbon trout streams in Montana,

including the Big Hole, Gallatin, Madison, and Smith rivers.

The objective of the research is to estimate the economic value of alternative levels of instream flow for fishery-related recreation purposes. The analysis will establish the economic value of changes in instream flows on a dollar per acre-foot basis.

The research is expected to be completed sometime in 1990.

4. A complentary study (as sponsored by the Montana Water Resources Research Center) is being funded by the U.S. Forest Service. It is once again being conducted by Dr. John Duffield and is focusing on the Bitterroot and Big Hole rivers.

III. ESTIMATES FROM OTHER STATES[1]

Study/Location	Use	Value $/ac.ft.
Daubert and Young[2] (Colorado)	fishing	21
	shoreline recreation	15
Walsh et al.[3] (Colorado)	fishing	21
	kayaking	5
	rafting	4
Walsh, Auckerman, and Milton[4] (Colorado)	reservoir recreation	48
Amirfathi et al.[5] (Utah)	river recreation	80
Ward[6] (New Mexico)	augmentation flows	16-27

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[1] The following studies reveal that the marginal value of an instream flow falls dramatically for high flow periods and when stored water is available to augment natural flow levels.

[2] The values estimated in this study are for an additional acre/foot of flow during low flow periods. The study indicates that the values for an additional unit of flow dropped to zero at higher flow levels -- suggesting that minimun flow maintenance is of more value to recreationists than additional increments to already adequate flows.

[3] The estimates in this study are based on the value of an additional acre-foot of flow beyond 35 percent of maximum stream flow (estimated to be the optimal amount of flow for recreational purposes).

[4] The estimate in this study is for leaving water in a high mountain reservoir for an additional two weeks in August, the peak recreation period.

[5] This study concludes that the value of additional flows is zero until flows drop to 50 percent of peak levels. The value of additional flows reached a maximum of $80 per acre-foot when flows were 20-25 percent of peak levels.

[6] This study estimates the value per acre-foot of reservoir releases in the summer recreation season, assuming optimal augmentation of streamflows during low flow periods.

IV. EXAMPLES FROM OTHER STATES[7]

State	Purpose	Value $/ac.ft.
California[8]	wetlands	10
California[9]	fish and wildlife	13.75
California[10]	wetlands	14
California[11]	salmon duck ponds	5.65
Colorado[12]	endangered fish	8

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[7] The following figures represent the actual costs paid to acquire instream flows for various purposes.

[8] The California Department of Fish and Game recently purcahsed 1,500 acre-feet of sewage effluent for use in duck ponds, to irrigate riparian vegetation, and to raise feed crops for wildlife (Water Market Update, November, 1989, p. 7).

[9] The California Department of Fish and Game and the Grasslands Water District purchased 30,000 acre-feet of water from the East Bay Municipal Utility District to support fish and wildlife habitat in the San Jacinto Wildlife Area (Water Market Update, October, 1989, p. 4).

[10] The Grasslands Water District is negotiating with the Bureau of Reclamation to buy 25,000 acre-feet of water from the Central Valley Project to enhance wetland values (Water Market Update, June, 1989, p. 5).

[11] The California Department of Fish and Game purchased 45,000 acre-feet of water from the Bureau of Reclamation's Central Valley Project to improve stream flows for chinook salmon. After the water flows through the critical stream reach, it is diverted into duck ponds in a refuge along the San Joaquin River (Water Market Update, November, 1988, p. 5).

[12] The Colorado Department of Natural Resources is attempting to purchase 750,000 acre-feet of water rights on the Yampa River for $6 million to protect endangered fish (Water Market Update, October, 1988, p. 10).

Nevada[20]	wetlands	21.80
New Mexico[21]	recreation	392
Oregon[22]	fisheries	1055

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[20] A Congressional conference committee appropriated $1.2 million to purchase 55,000 acre-feet of water for the Stillwater National Wildlife Refuge (Water Market Update, September, 1988, p. 7).

[21] The City of Albuquerque purchased 6,000 acre-feet of water per year for 25 years for $2.5 million from the San Juan-Chama Project to facilitate rafting and other recreational activities on the Rio Chama River (Water Market Update, June, 1989, p. 5).

[22] The Bureau of Reclamation is purchasing 40,000 acre-feet of Columbia River water per year and will pump the water to irrigators with senior water rights in the Umatilla River. In exchange, the irrigators will cease their Umatilla River diversions, thereby leaving water instream for salmon and steelhead fisheries (Water Market Update, November, 1989, p. 7).

The Economic Value of Hunting and Fishing in Montana (A Study sponsored by Montana Department of Fish, Wildlife and Parks, 1987; Conducted Dr. John Duffield and Rob Brooks).

Activity	Total Expenditures* (Total amount spent by all resident and nonresident sportsmen.)	Expenditures* Per Trip (Average amount spent per trip by a typical resident/ nonresident sportsman.)	Net Economic Value Per Trip (The additional amount a typical resident/nonresident sportsman would have been willing to pay for the same trip over and above his actual expenditures.*)	Net Economic Value Per Day (The additional amount a typical resident/nonresident sportsman would have been willing to pay per day over and above his actual expenditures.*)	Total Resource Value (Total number of angler and hunter days multiplied by the Net Economic Value Per Day for that activity.)
Sport Fishing (Streams)	$52.4 million	$ 97	$113	$102	$122 million
Sport Fishing (Lakes)	$47.3 million	$ 91	$ 89	$ 70	$93 million
Elk Hunting	$58.4 million	$285	$184	$ 66	$37.6 million
Deer Hunting	$63.8 million	$146	$108	$ 55	$36.5 million
Antelope Hunting	$4.5 million	$114	$143	$ 62	$6 million

*Expenditures include transportation costs, lodging, food, guide fees and other purchases, excluding license fees.

$226.4 million

Montana Department of Fish, Wildlife & Parks

The Independent Record, Helena, MT, Tuesday, November 21, 1989 (p. 3B)

Fishermen can carry a lot of clout

They spend billions chasing their quarry

ATLANTA (AP) — "I am Joe Fisherman and I've got clout!"

That's the message being presented by the Sport Fishing Institute in a new video being sent to sportsmen's clubs and outdoor activists around the nation.

Fishermen spent $27 billion chasing their finned quarry in 1985, an amount equal to sales by K-mart, the 13th-ranked corporation in the country on the Forbes 500 list.

Joe Fishermen and his 60 million angling buddies provide 862,783 jobs, or about 100,000 more jobs than provided by General Motors, the nation's largest industrial corporation.

"THE PURPOSE OF THE video was to let local fishing groups know we are here to assist them with local issues that may interfere with their fishing," said Rob Southwick, an economics technician with SFI, which is financed by the American Fishing Tackle Manufacturers Association.

The video features puppets representing business, wastewater treatment and commercial fishing, interests that use water, and Joe Fisherman, a youngster who isn't invited to take part in discussions over how to use the water in which he practices his sport.

"We must have sent out about 700 copies," Southwick said. "It's to show we can provide data to present to the decision makers, to show just how important recreational fishery resources are."

FLORIDA, WITH ITS HUGE salt water sport fishing industry and abundance of freshwater lakes, leads the nation in sport fishing spending. Anglers spent $3.06 billion there. In addiion, fishing provides 97,497 jobs in Florida.

California was second with $2.21 billion in spending and 70,350 jobs, followed by Texas, $1.89 billion and 60,329; Michigan, $1.44 billion and 39,229, and New York, $1.07 billion and 27,894.

That kind of clout will replace legislators and others, if local groups organize and present the information, Southwick said. "We felt the video would be the most entertaining way to keep the people's attention and to show the services we offer.

SOME HIGHLIGHTS from SFI data:

Fishermen spent $4.3 billion on food and refreshments, $3.3 billion on transportation, $1.16 billion on boat fuel, $2.1 billion in inboard boats, $2.29 billion on outboard boats and $1.77 billion on a pickup, camper or van used for fishing. They also paid $1.3 billion in sales taxes on their purchases.

State-by-state look

ATLANTA (AP) — Here is a state-by-state list compiled by the Sport Fishing Instute showing each state and the amount of money spent there by anglers and the number of jobs provided by recreational fishing:

1. Florida	$3,062,622,386	97,497
2. California	2,209,449,539	70,350
3. Texas	1,886,853,390	60,329
4. Michigan	1,438,736,751	39,229
5. New York	1,074,455,823	27,894
6. Georgia	946,638,202	27,706
7. Missouri	905,840,431	27,703
8. North Carolina	901,484,257	33,636
9. New Jersey	855,400,004	25,909
10. Ohio	855,241,378	29,501
11. Minnesota	816,749,586	26,782
12. Pennsylvania	769,087,737	24,650
13. Wisconsin	707,477,263	25,579
14. Illinois	610,630,805	22,027
15. S. Carolina	597,113,113	22,207
16. Washington	568,803,515	19,275
17. Louisiana	538,452,108	17,252
18. Indiana	537,242,686	19,779
19. Alabama	519,118,274	19,082
20. Virginia	492,803,524	15,662
21. Tennessee	480,741,369	18,058
22. Colorado	479,393,662	12,863
23. Massachusetts	465,259,491	15,150
24. Oregon	449,865,439	13,271
25. Oklahoma	441,226,833	13,418
26. Mississippi	428,036,094	17,721
27. Arkansas	372,302,746	14,195
28. Kentucky	338,624,175	10,980
29. Maryland	314,041,586	9,827
30. Arizona	302,757,930	7,588
31. Iowa	208,310,967	7,931
32. Alaska	204,723,802	3,033
33. Connecticut	198,799,240	5,842
34. Montana	193,609,766	4,845
35. Kansas	185,592,681	6,481
36. Idaho	169,853,733	4,582
37. Utah	169,646,191	5,930
38. New Mexico	159,769,492	4,168
39. Maine	151,343,372	5,343
40. Nebraska	140,857,854	4,653
41. Rhode Island	138,031,941	4,631
42. Nevada	135,946,696	2,163
43. Delaware	128,343,348	3,282
44. W. Virginia	113,517,530	2,591
45. Wyoming	109,225,081	2,638
46. Hawaii	99,640,491	2,592
47. N. Dakota	97,525,479	2,417
48. N. Hampshire	88,770,014	2,630
49. S. Dakota	52,522,877	1,490
50. Vermont	43,591,743	1,267