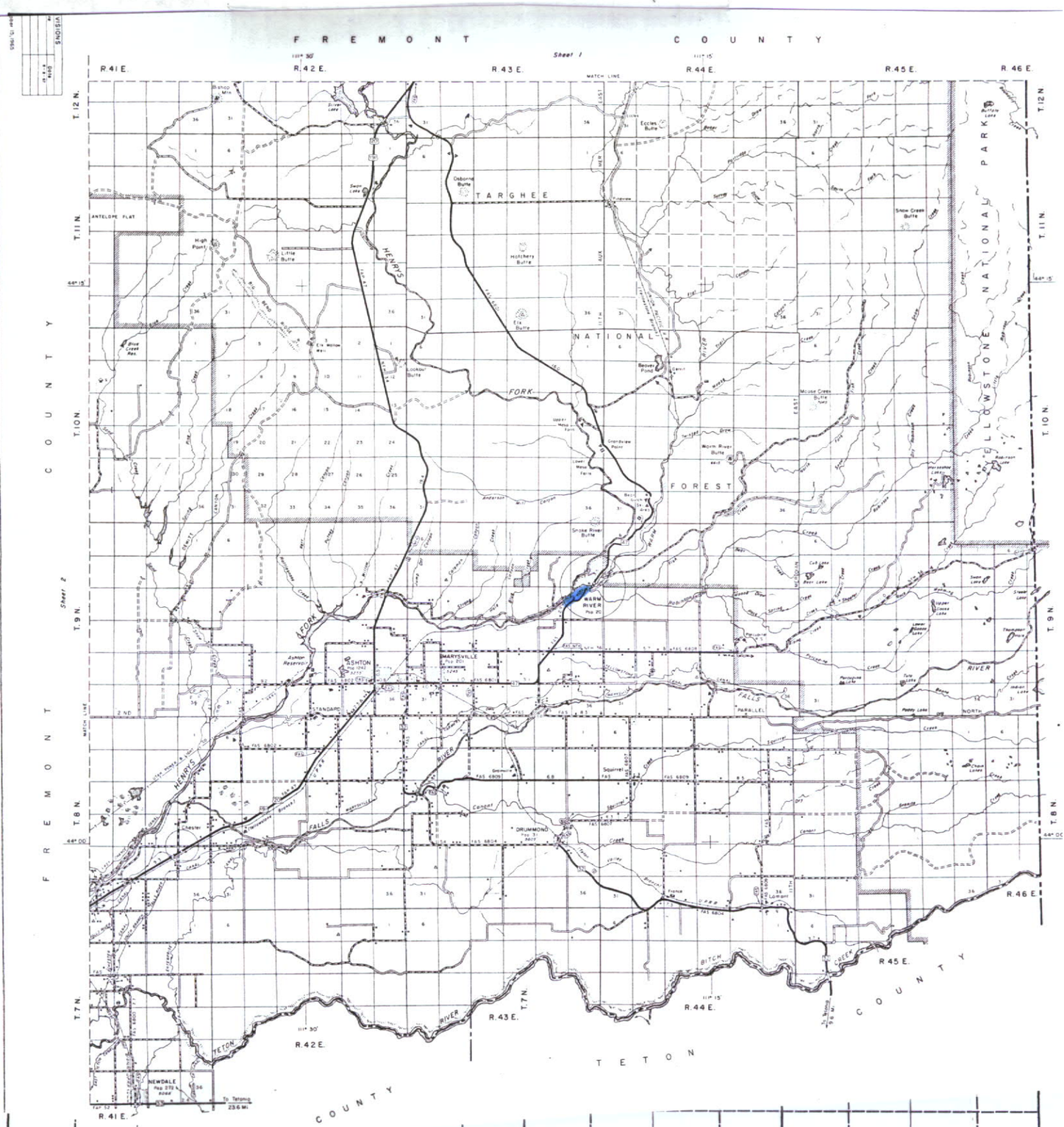
11. Map of proposed project: show clearly the proposed point of diversion, place of use, section number, township and range number.



Scale: 2 inches equal 1 mile.

1/4

BE IT KNOWN that the undersigned hereby makes application for permit to appropriate the public waters of the State of Idaho as herein set forth.

MICROFILMED
JAN 06 1989

M. Reed Hansen
(Applicant)

Chairman

Idaho Water Resource Board

AFFIDAVIT OF PUBLICATION

State of Idaho } ss.
County of Fremont }

Carol Bessey
her
being first duly sworn, upon ~~his~~ oath, deposes and says:

That She is the Editor of The Ashton Herald, a newspaper as defined by Idaho Codes Annotated, section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at St. Anthony, in Fremont County, Idaho, having a general circulation in said county, and that said newspaper has been printed and published as a weekly newspaper in said county for more than 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of Notice of Application for Minimum Stream Flow #21-7283

And affiant further says that said notice, advertisement of publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issue thereof, for 2 consecutive issues thereof; first publication having been made on the 13 day of August, 1981, and the last publication on the 20 day of August 1981.

And affiant further says that at the times herein mentioned said newspaper was made up of at least four pages of at least five columns each, printed from type matter, of at least seventeen and three-fourths inches deep.

Carol Bessey

Subscribed in my presence ~~and~~ sworn to before me this 1st day of Sept, 1981.

Linda Sheldon

[SEAL] Notary Public for the State of Idaho, residence and post office address: ~~St. Anthony~~, Idaho. Ashton

RECEIVED
SEP 3 1981
Department of Water Resources
Eastern District Office

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the following application has been submitted for permit to appropriate the public waters of the State of Idaho:

Notice is hereby given that the Idaho Water Resource Board has on June 19, 1981 submitted application 21-7283 for a permit to the Department of Water Resources proposing the appropriation of 141 cubic feet per second of water within the NW¼NW¼, Sec. 13, Twp. 9N Rge. 43E, Fremont County to preserve the minimum stream flow subject to all prior water rights for maintaining the present quality of fisheries and provide adequate spawning and rearing conditions year around in Warm River tributary of Henry's Fork Snake River.

Pursuant to Title 42, Chapter 15 of the Idaho Code a legal notice will be published at a later date setting a time and place for a hearing during which opportunity will be provided for public comment.

A. KENNETH DUNN
Director

Publ. Aug. 13 and 20, 1981AH

MICROFI
JAN 0 6

THE CHRONICLE-NEWS

ST. ANTHONY, IDAHO

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO } ss
County of Fremont }

I, Terry Weatherston, being first duly sworn, depose and say, that I am the pnnter of THE CHRONICLE-NEWS, a weekly newspaper printed and published weekly at St. Anthony, Fremont County, Idaho; and I do solemnly swear that the

Notice Of Public Meeting

a copy of which notice appears attached hereto, was published in the regular and entire issue of said newspaper, and not in any supplement issue thereof for 2 consecutive issues, the first publication having been made on September 13, 1984 and the last publication having been made on September 20, 1984.

Further, that said newspaper is one of general circulation in said county; that it is a legal newspaper, conforming to legal specifications under the Idaho Statutes; that it has at least two hundred bona fide subscribers living within the county of publication; and that it has been continuously and uninterruptedly published in said county during a period of seventy-eight consecutive weeks prior to the first publication of the said notice.

Terry Weatherston

Subscribed to and sworn to before me this September 21, 1984

Notary Public

(SEAL)

My commission expires life

NOTICE OF PUBLIC MEETING

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

No. 21-7281 proposing the appropriation of 140 cfs of water from Fall River tributary to Henry's Fork Snake River. The location of the reach is the NE¼SE¼, Sec. 14, T. 8N, R. 41E, upstream approximately 8 miles to State Highway 32 in the SE¼NW¼, Sec. 18, T. 8N, R. 43E.

No. 21-7283 proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NW¼, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SW¼SE¼, Sec. 12, T. 9N, R. 43E, B.M., both in Fremont County.

On Thursday, September 27, 1984 at 7:30 p.m. in the Courtroom, Teton County Courthouse, Driggs, Idaho an additional public meeting will be held to receive comments on minimum streamflow applications as follows:

No. 22-7369 proposing the appropriation of 106 cfs from Teton River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 9 miles to State Highway 33 in the SE¼SW¼, Sec. 23, T. 8N, R. 44E.

No. 22-7370 proposing the appropriation of 28 cfs from the Bitch Creek tributary to Teton River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 6 miles to State Highway 32 in the NW¼NW¼, Sec. 17, T. 7N, R. 45E, B.M., both in Teton County.

All of the above applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

KENNETH DUNN
Director

Publ. Sept. 13 and 20, 1984

RECEIVED
OCT 4 1984
Department of Water Resources
Eastern District Office

MICROFILMED
JAN 06 1989

RECEIVED
OCT 25 1985
Department of Water Resources
Eastern District Office

STATE OF IDAHO)
) ss.
COUNTY OF ADA)

Laura Gay Barnes, being duly sworn, deposes and says: That she is the Principal Clerk of The Idaho Statesman, a daily newspaper printed and published at Boise, Ada County, State of Idaho, and having a general circulation therein and which said newspaper has been continuously and uninterruptedly published in said County during a period of twelve consecutive months prior to the first publication of the notice, a copy of which is attached hereto; that said notice was published in The Idaho Statesman in conformity with Section 60-108, Idaho Code as amended, for Two (2) consecutive weekly insertions beginning with the issue of

October 17, 1985, and ending with the issue of October 24, 1985.

Laura Gay Barnes

Subscribed and sworn to before me this 24th day of October, 1985.

Jeanne M Hawke

Notary Public for Idaho, Residing at Boise, Idaho.

RECEIVED
JAN 06 1989

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981, Application No. 21-7283, proposing the appropriation of 141 cfs of water from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E., upstream approximately ½ mile to State Highway 47 in the SWSE, Sec. 12, T. 9N., R. 43E.

On September 27, 1984, Application No. 21-7355, proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork. The location of the reach is the SWSE, Sec. 12, T. 9N., R. 43E., from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Sec. 10, T. 10N., R. 44E., B.M., both in Fremont County.

The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The Director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m., November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of *Section 42-1503, Idaho Code.*

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued, the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Pub. Oct. 17, 24, 1985 9361

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

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If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

PUBLISH: **Thursday**, October 17, and 24, 1985.

Affidavit of Publication

STATE OF IDAHO, }
COUNTY OF TWIN FALLS } ss.

№ 15581

I, Linda Copps McGuire being first duly sworn upon oath, depose and say that I am Print Clerk of the TIMES-NEWS, published daily, at Twin Falls, Idaho, and do solemnly swear that a copy of the notice of advertisement, as per clipping attached, was published in the regular and entire issue of said newspaper, and not in any supplement thereof, for Two consecutive Weeks, commencing with the issue dated October 17, 1985, and ending with the issue dated October 24, 1985.

And I do further certify that said newspaper is a consolidation, effective February 16, 1942, of the Idaho Evening Times, published theretofore daily except Sunday, and the Twin Falls News, published theretofore daily except Monday, both of which newspapers prior to consolidation had been published under said names in said city and county continuously and uninterruptedly during a period of more than twelve consecutive months, and said TIMES-NEWS, since such consolidation, has been published as a daily newspaper except Saturday, until July 31, 1978, at which time said newspaper began daily publication under said name in said city and county continuously and uninterruptedly.

And I further certify that pursuant to Section 60-108 Idaho Code, Thursday of each week has been designated as the day on which legal notice by law or by order of any court of competent jurisdiction within the state of Idaho, to be published weekly, will be published; and that at the head of the editorial column of said combined newspapers, and in each issue thereof, Thursday is announced as the day on which said legal notices will be published.

Linda Copps McGuire

Subscribed and sworn to before me on this 24 day of October, 1985

Deanna Bruce

Notary Public in and for the County of Twin Falls, State of Idaho, residing at Twin Falls, Idaho

AFFIDAVIT OF PUBLICATION

State of Idaho } ss.
County of Fremont }

Helen D. Smith

being first duly sworn, upon ~~his~~ her oath, deposes and says:

That she is the Business Clerk of The Ashton Herald, a newspaper as defined by Idaho Codes Annotated, section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at St. Anthony, in Fremont County, Idaho, having a general circulation in said county, and that said newspaper has been printed and published as a weekly newspaper in said county for more than 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of .....

notice of public hearing Fremont County

And affiant further says that said notice, advertisement of publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issue thereof, for ....2..... consecutive issues thereof; first publication having been made on the ..17.... day of ..October....., 19~~85~~, and the last publication on the ~~24~~....day of..October..... 19~~85~~.

And affiant further says that at the times herein mentioned said newspaper was made up of at least four pages of at least five columns each, printed from type matter, of at least seventeen and three-fourths inches deep.

Helen D. Smith

Subscribed in my presence and sworn to before me this ~~29~~ day of October....., 19~~85~~.

James E. Holcomb

[SEAL] Notary Public for the State of Idaho, residence and post office address: ~~St. Anthony~~ Ashton, Idaho.

RECEIVED
OCT [illegible] 1985
Department of Water Resources
Eastern District Office

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION
FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981 application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately ½ mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R 43E.

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The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The Director of the Department of Water Resources will hold a pulic hearing on the applications in the Courthouse, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of Section 42-1503, **Idaho Code.**

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearning. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issured the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Publ. Oct. 17 and 24, 1985AH

MICROFILMED
JAN 06 1989

RECEIVED
NOV 7 1985
Department of Water Resources
Eastern District Office

THE CHRONICLE-NEWS
ST. ANTHONY, IDAHO

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO }
County of Fremont } ss

I, Terry Weatherston,
being first duly sworn, depose and say, that I am the printer of THE CHRONICLE-NEWS, a weekly newspaper printed and published weekly at St. Anthony, Fremont County, Idaho; and I do solemnly swear that the

Legal Notice

a copy of which notice appears attached hereto, was published in the regular and entire issue of said newspaper, and not in any supplement issue thereof for 2 consecutive issues, the first publication having been made on Oct. 17, 1985 and the last publication having been made on Oct. 24, 1985.

Further, that said newspaper is one of general circulation in said county; that it is a legal newspaper, conforming to legal specifications under the Idaho Statutes; that it has at least two hundred bona fide subscribers living within the county of publication; and that it has been continuously and uninteruptedly published in said county during a period of seventy-eight consecutive weeks prior to the first publication of the said notice.

Terry Weatherston

Subscribed to and sworn to before me this Oct. 25, 1985

Geri Garner
Notary Public.

(SEAL)

My commission expires life

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

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The applications were filed to protect the quality of the fisheries habitat within the specific reach on each stream.

The Director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of Section 42-1503, **Idaho Code.**

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Publ. Oct. 17 and 24, 1985CN.

MICROFILMED
JAN 06 1989

POOR QUALITY

INDICATES TOTAL

RIGHT NUMBER	NAME AND ADDRESS	PRIORITY DATE	USE	USE PERIOD FROM	USE PERIOD TO	MAX AMOUNT MAX RATE	DIVERSION POINT	PLACE OF USE AND ACREAGE	BASIS FOR RIGHT
21-7281	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-19-1981	MINIMUM IN STREAM FLO	01-01	12-31	140.00 CFS	NESE S14 T08N R41E SENW S18 T08N R43E	NESE S14 T08N R41E	APPLICATION
	SOURCE: FALL RIVER	TRIBUTARY: SNAKE RIVER, HENRYS FORK							
	OTHER USES: MAINTAIN FISHERY HABITAT.								
	REMARKS: P/D'S ARE LOCATION OF REACH.								
21-7282	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-19-1981	MINIMUM IN STREAM FLO	04-01	09-30	1000.00 CFS	NWNW S33 T13N R43E SENE S25 T10N R43E	NWNW S33 T13N R43E	APPLICATION
	SOURCE: HENRYS FORK	TRIBUTARY: SNAKE RIVER							
	REMARKS: P/D'S ARE LOCATION OF REACH.								
						300.00 CFS		NWNW S33 T13N R43E	
21-7283	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-19-1981	MINIMUM IN STREAM FLO	01-01	12-31	141.00 CFS	NWNW S13 T09N R43E SWSE S12 T09N R43E	NWNW S13 T09N R43E	APPLICATION
	SOURCE: HENRYS FORK	TRIBUTARY: SNAKE RIVER, HENRYS FORK							
	OTHER USES: MAINTAIN FISHERY HABITAT.								
	REMARKS: P/D'S ARE LOCATION OF REACH.								

Yours as applications as you suggested but hearing will be scheduled during next adv. of the same apps.

RECEIVED
AUG 5 1981
Department of Water Resources
Eastern District Office

MICROFILMED
JAN 06 1989

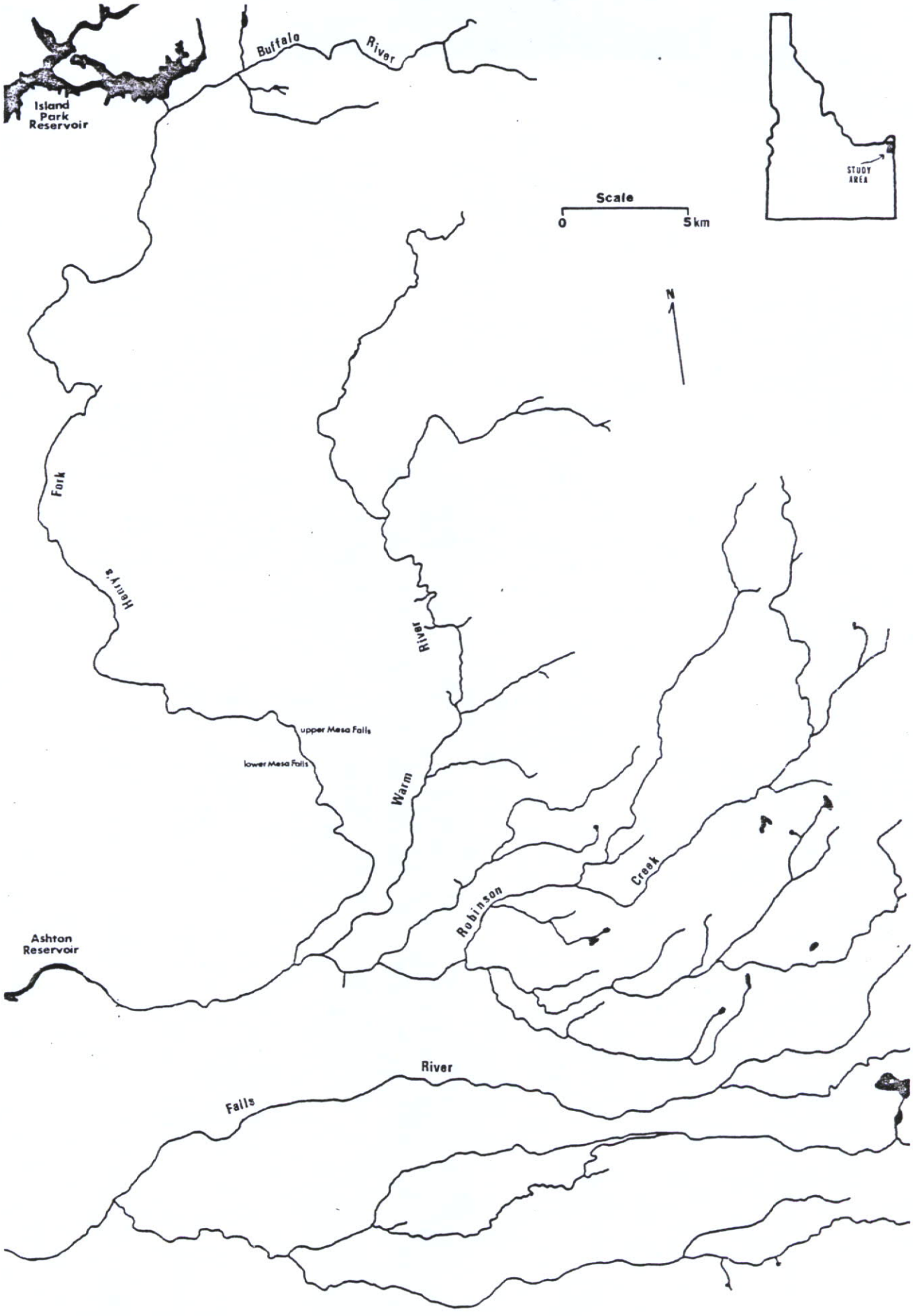


Figure 1. Map of Henrys Fork of the Snake River from Island Park Reservoir to Ashton Reservoir showing tributary drainages surveyed in 1983.

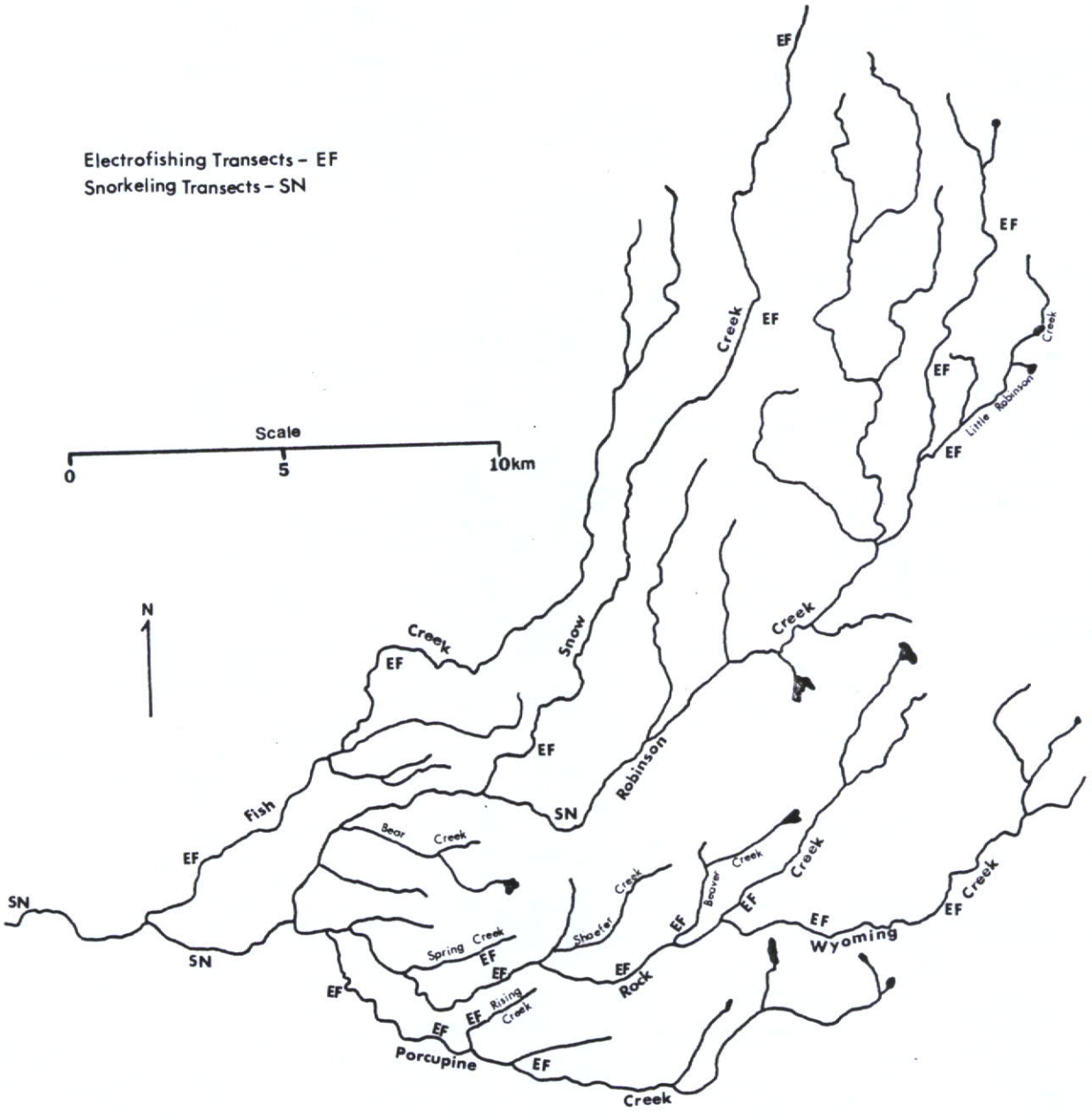


Figure 2. Locations of electrofishing and snorkel transects in Robinson Creek and tributaries, 1983.

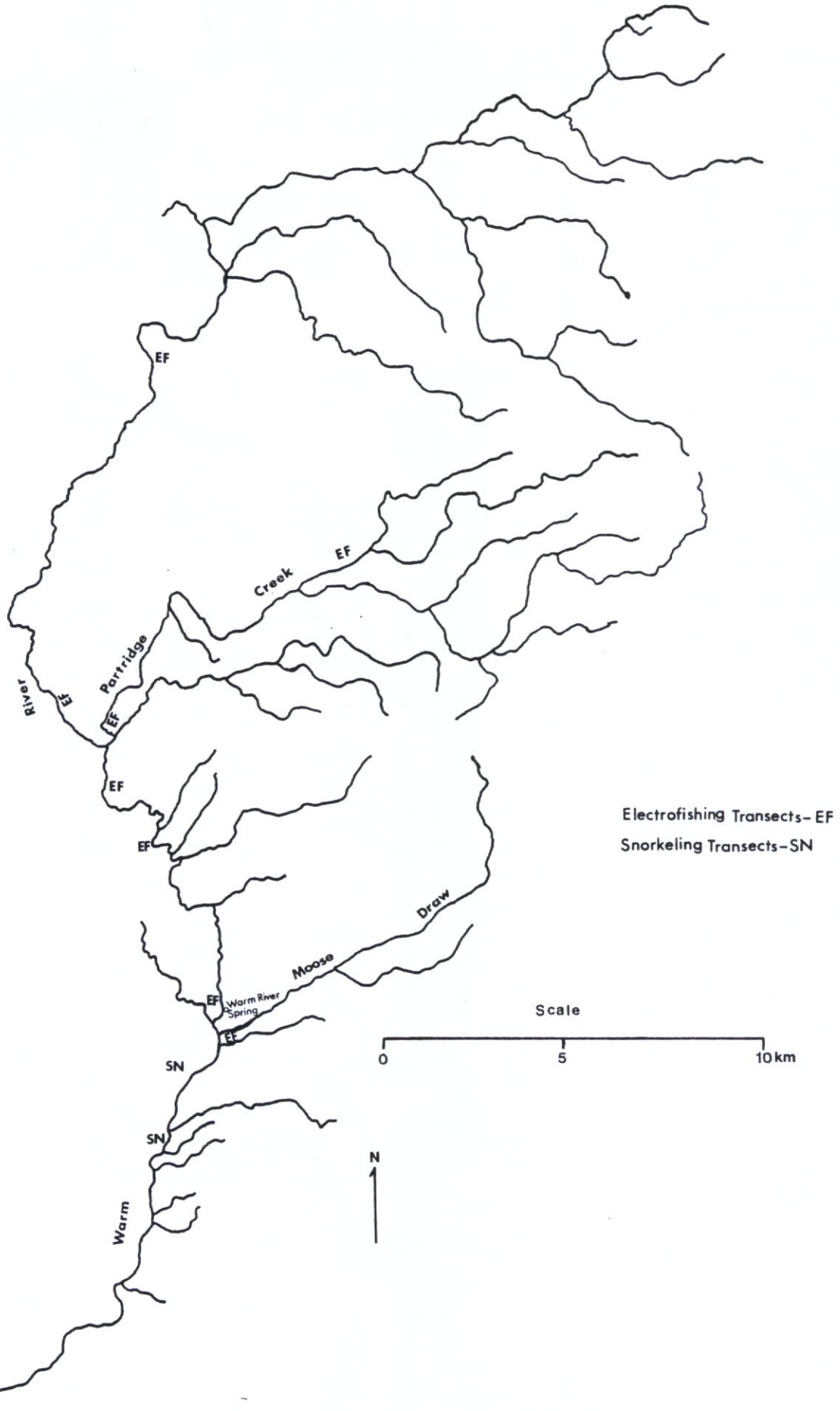


Figure 3. Locations of electrofishing and snorkel transects on Warm River and tributaries, 1983.

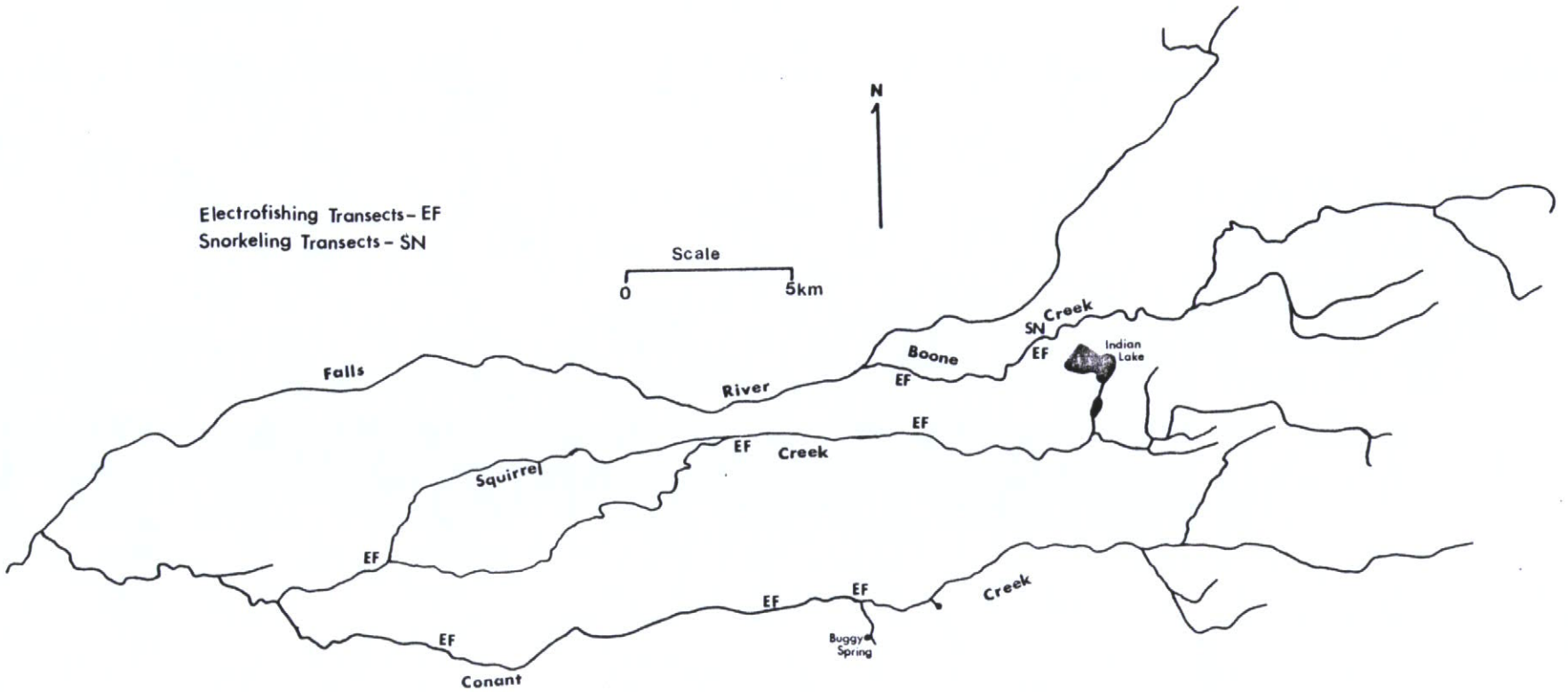


Figure 4. Locations of electrofishing and snorkel transects on Falls River and tributaries, 1983.

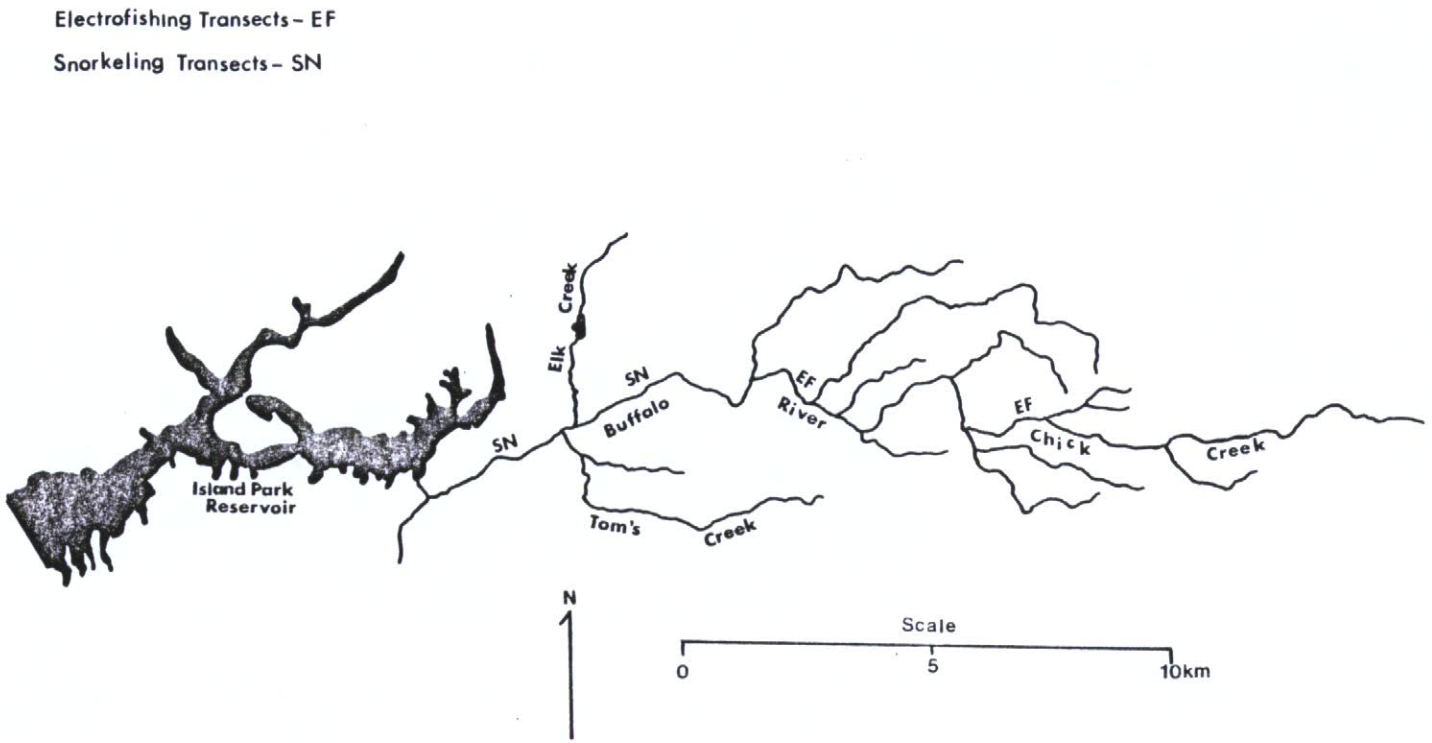


Figure 5. Locations of electrofishing and snorkeling transects on Buffalo River and tributaries, 1983.

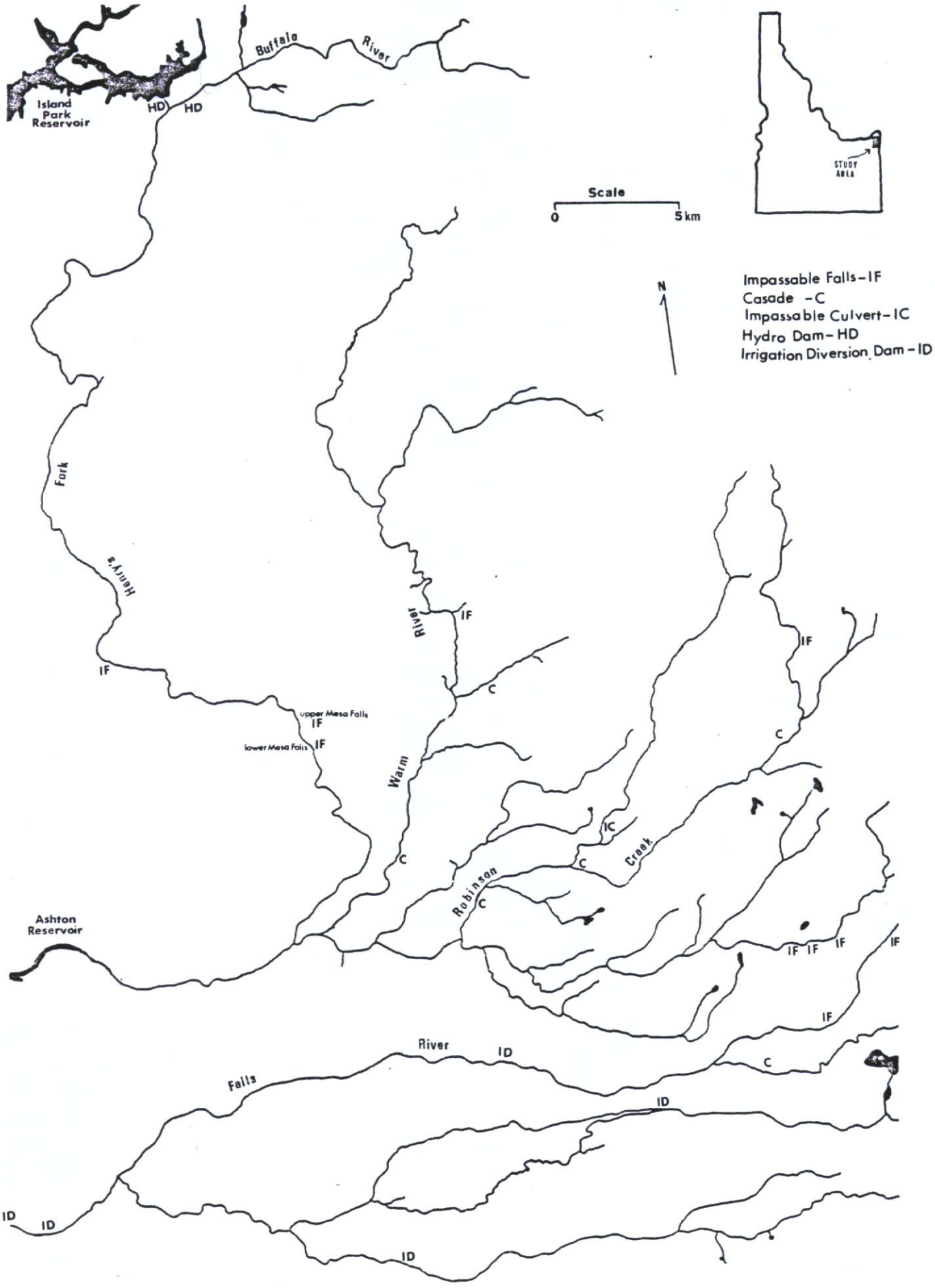


Figure 6. Natural and man-made barriers to fish migration in Henrys Fork and tributaries.

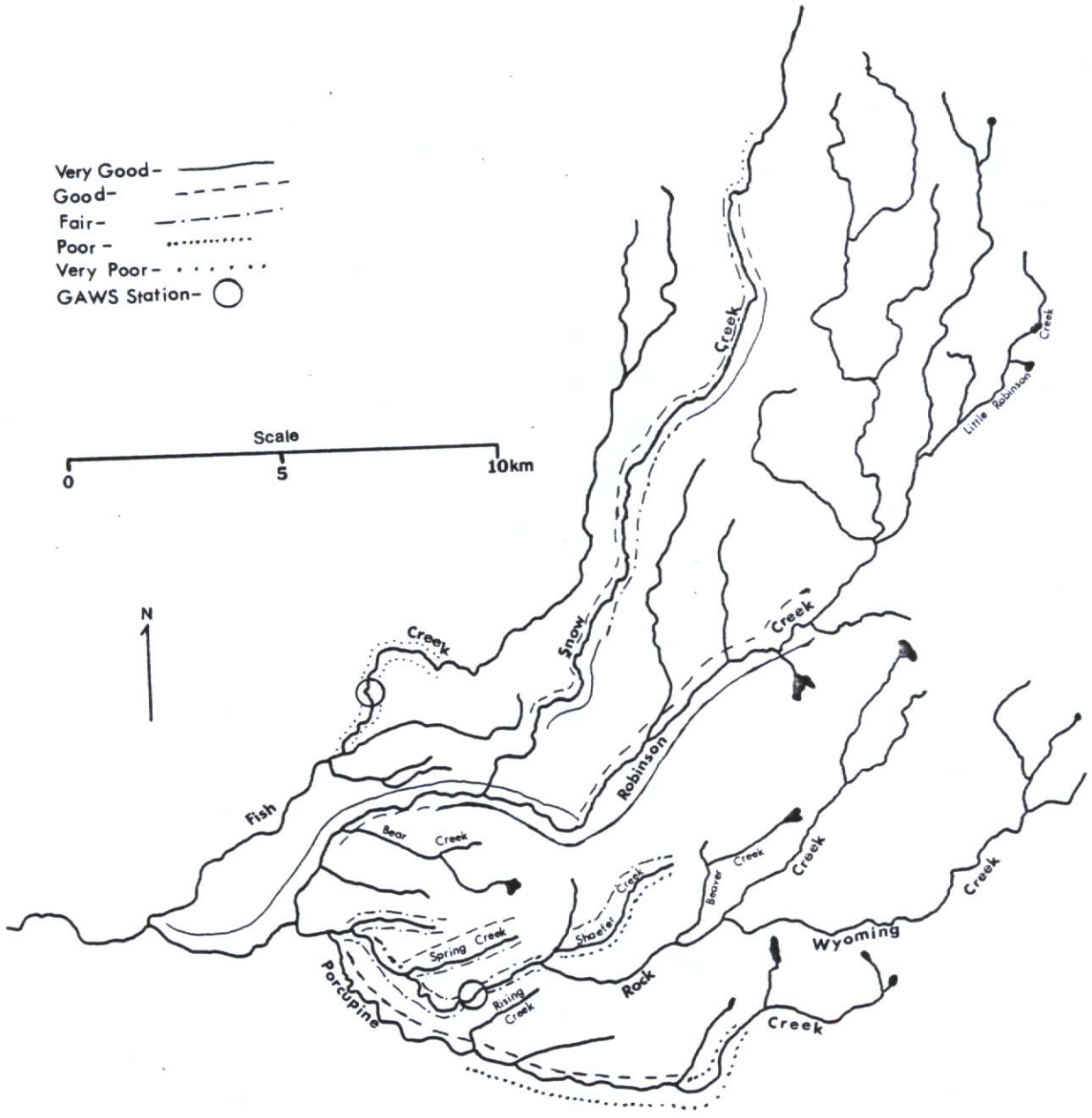


Figure 7. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Robinson Creek and tributaries in Targhee National Forest. Data from Rainville (1978).

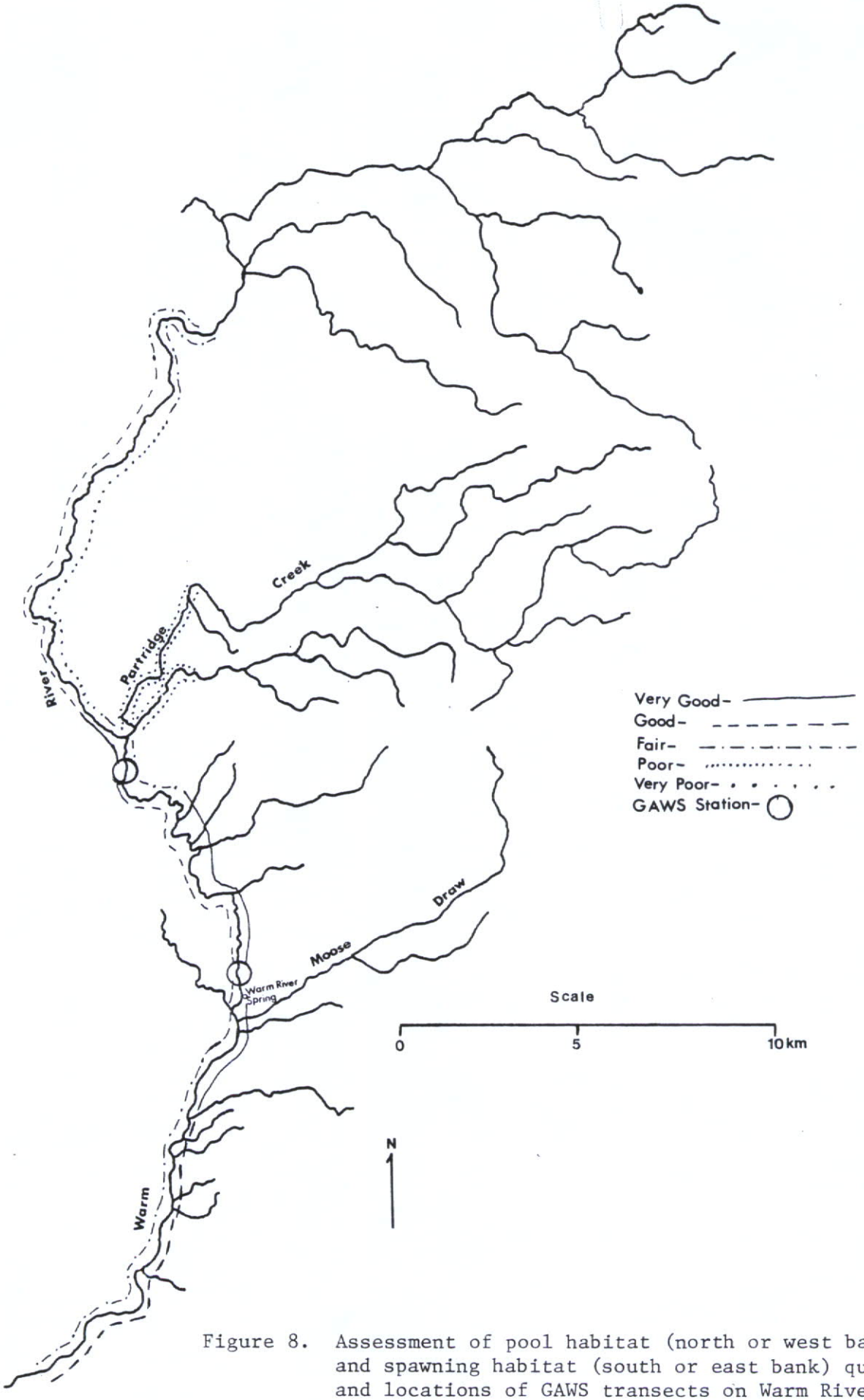


Figure 8. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Warm River and tributaries in Targhee National Forest. Data from Rainville (1978).

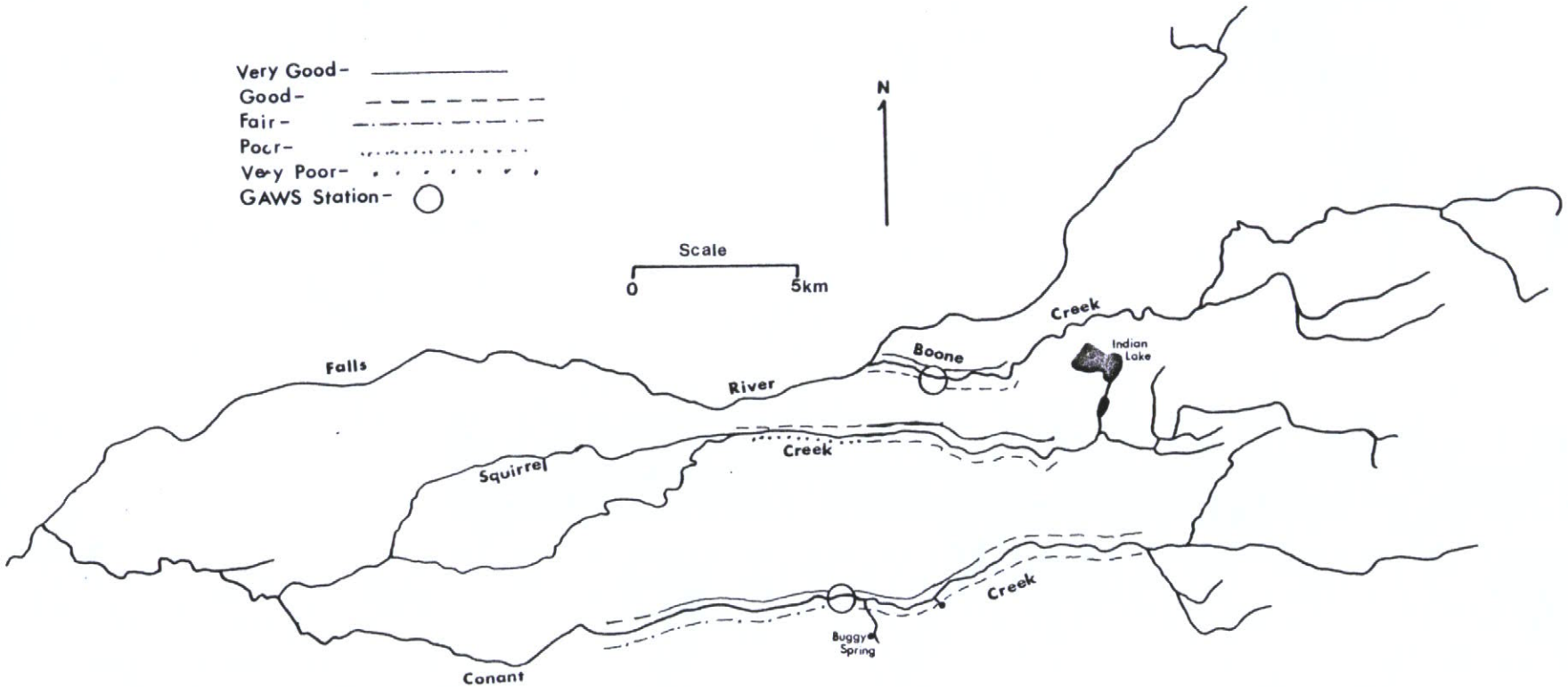


Figure 9. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Falls River tributaries in Targhee National Forest. Data from Rainville (1978).

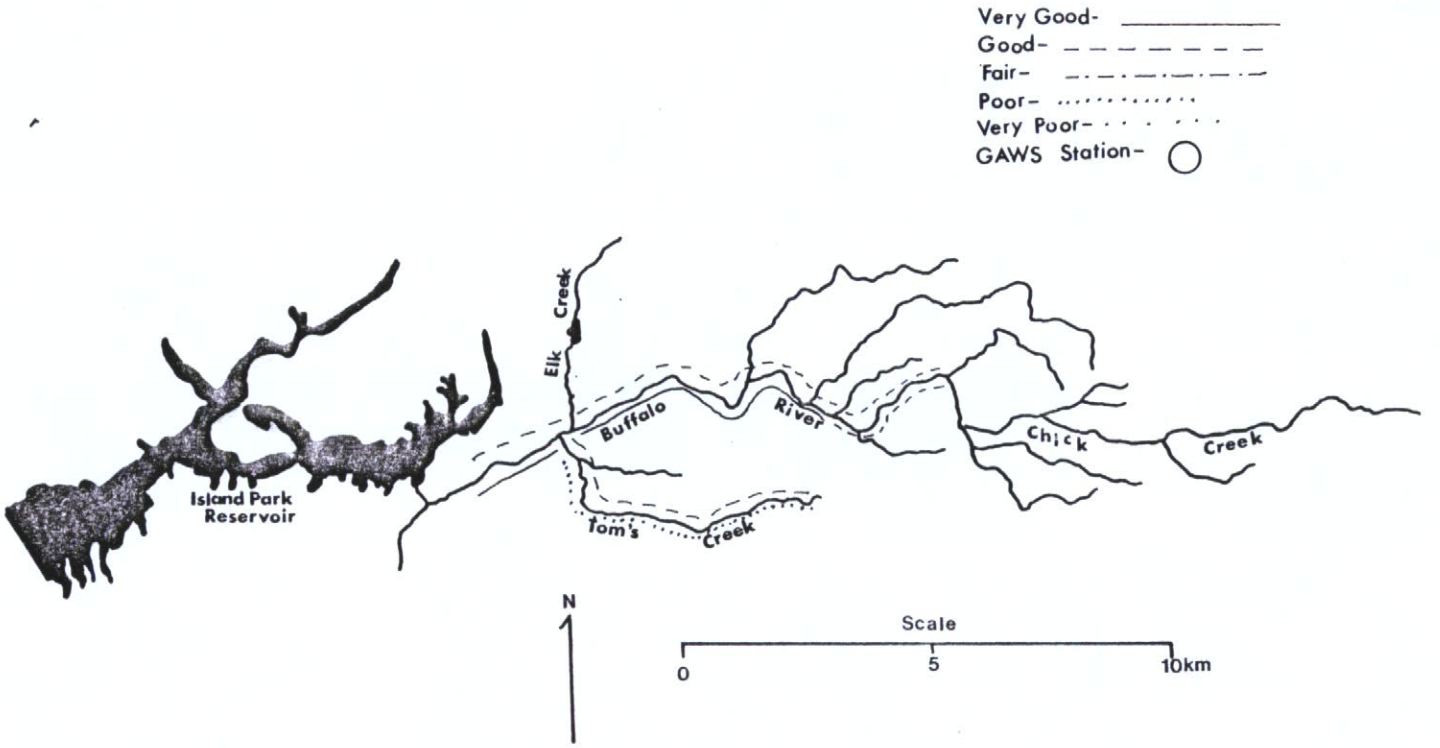


Figure 10. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Buffalo River and tributaries in Targhee National Forest. Data from Rainville (1978).

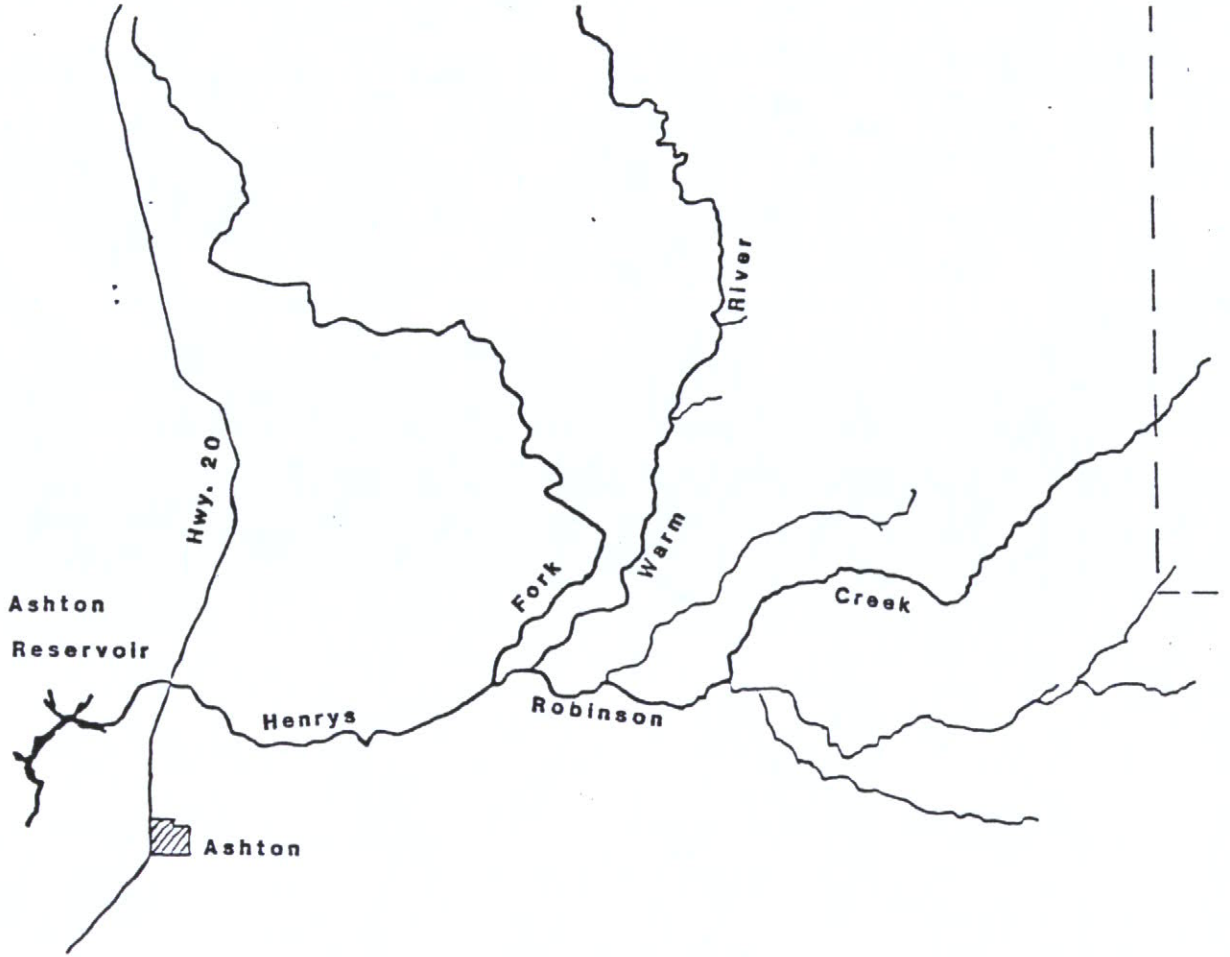


Figure 1. Map of the study area showing the Henrys Fork of the Snake River, Warm River and Robinson Creek.

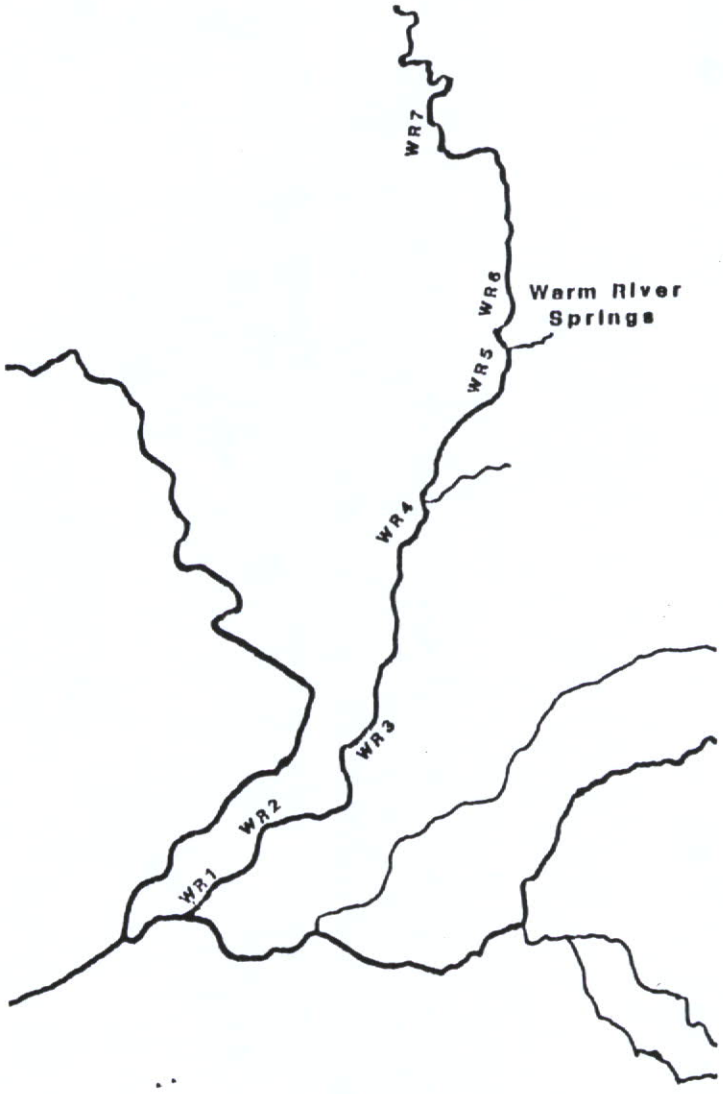


Figure 2. Locations of electrofishing and snorkel transects on Warm River, 1984.

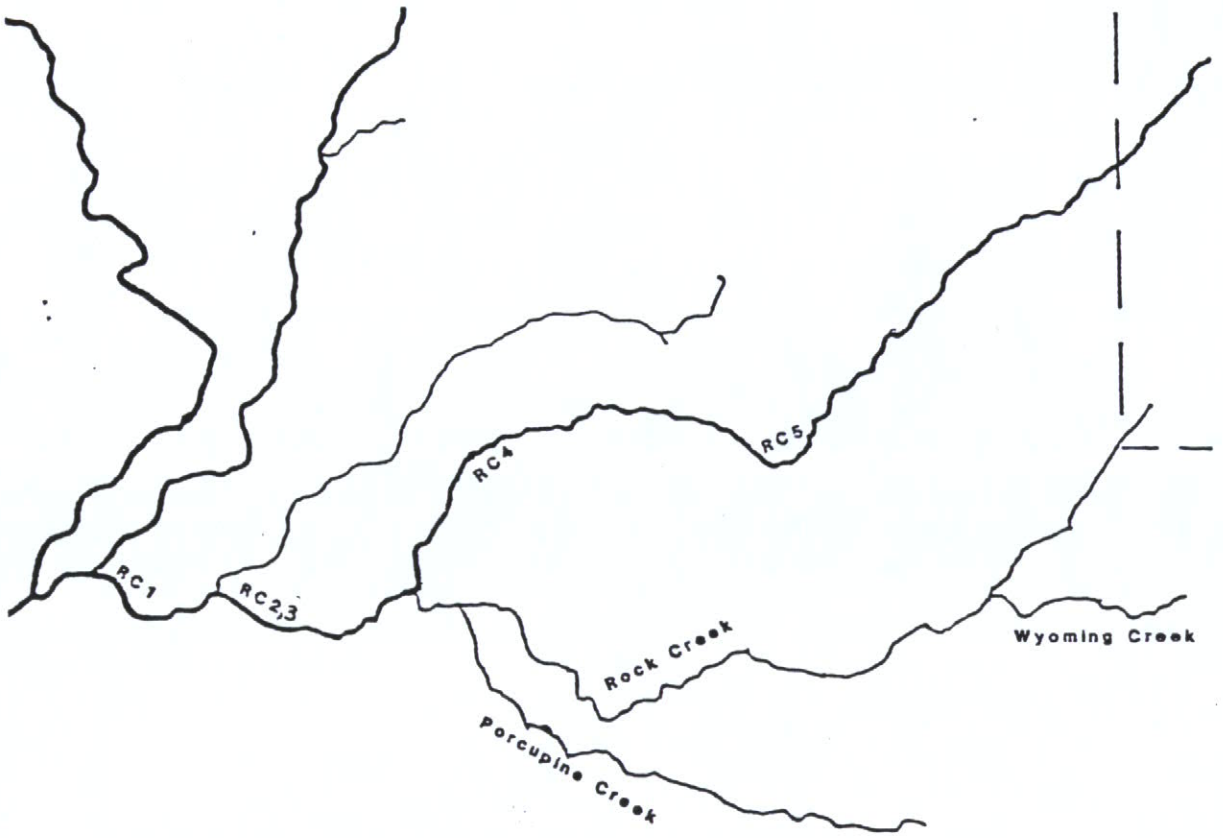


Figure 3. Locations of electrofishing and snorkeling transects on Robinson Creek, 1984.

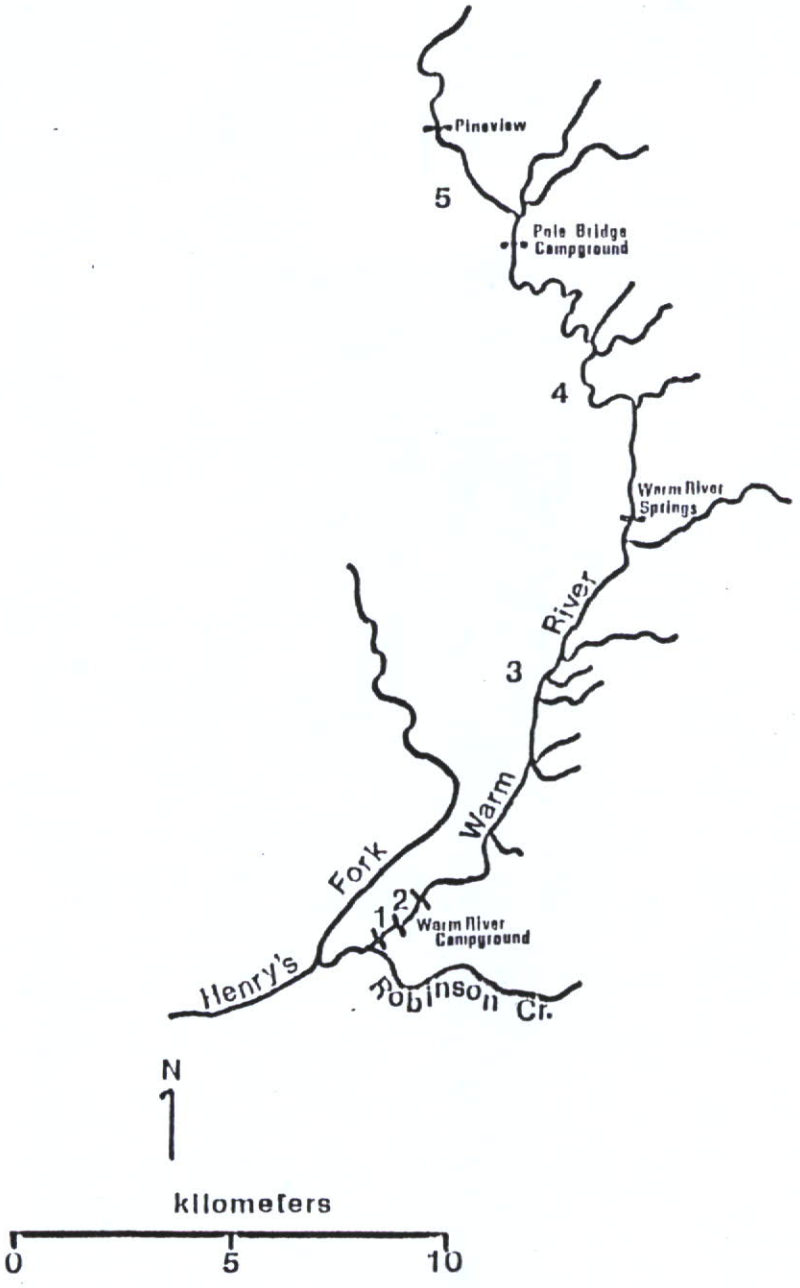


Figure 4. Map of Warm River showing creel census sections.

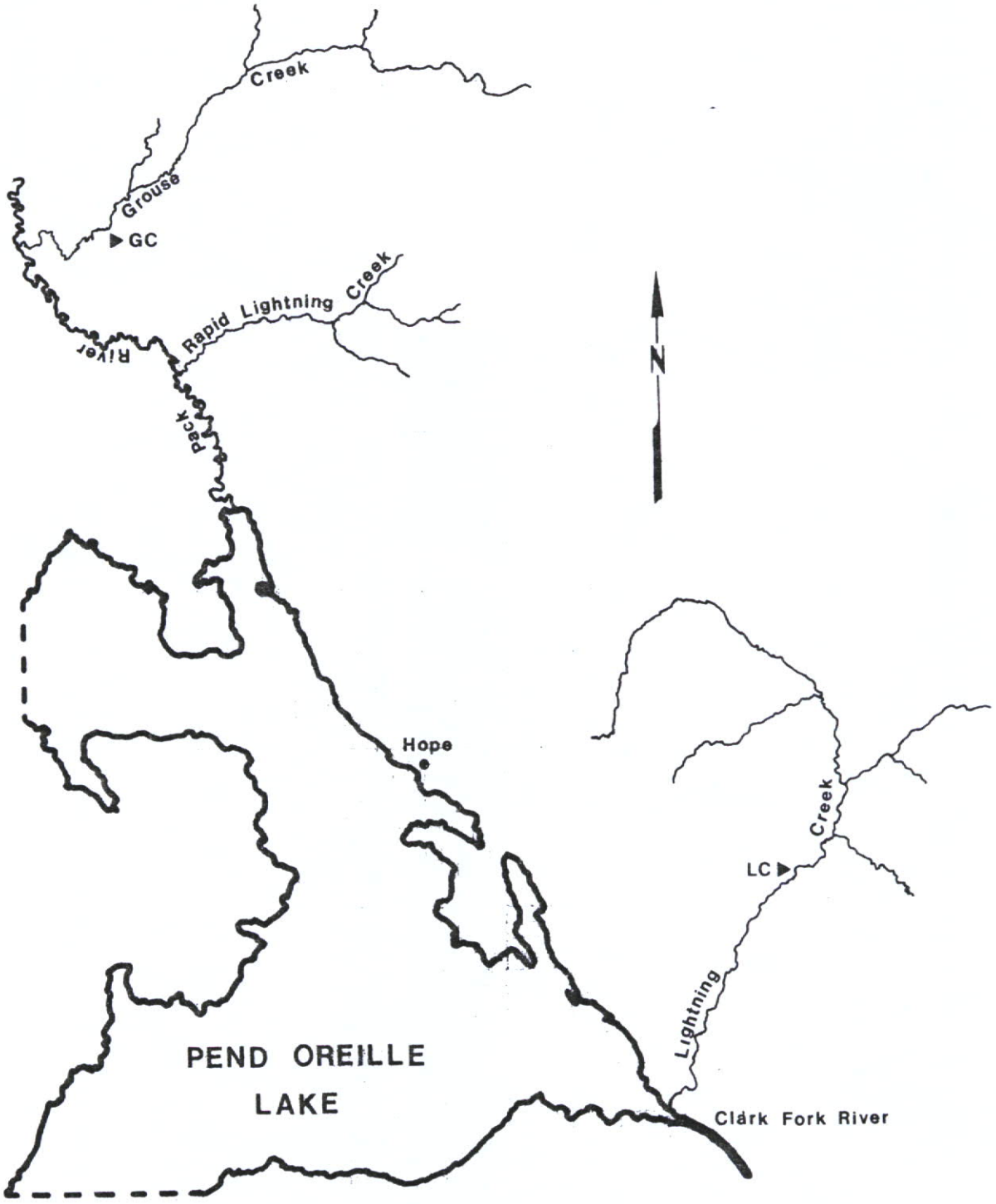
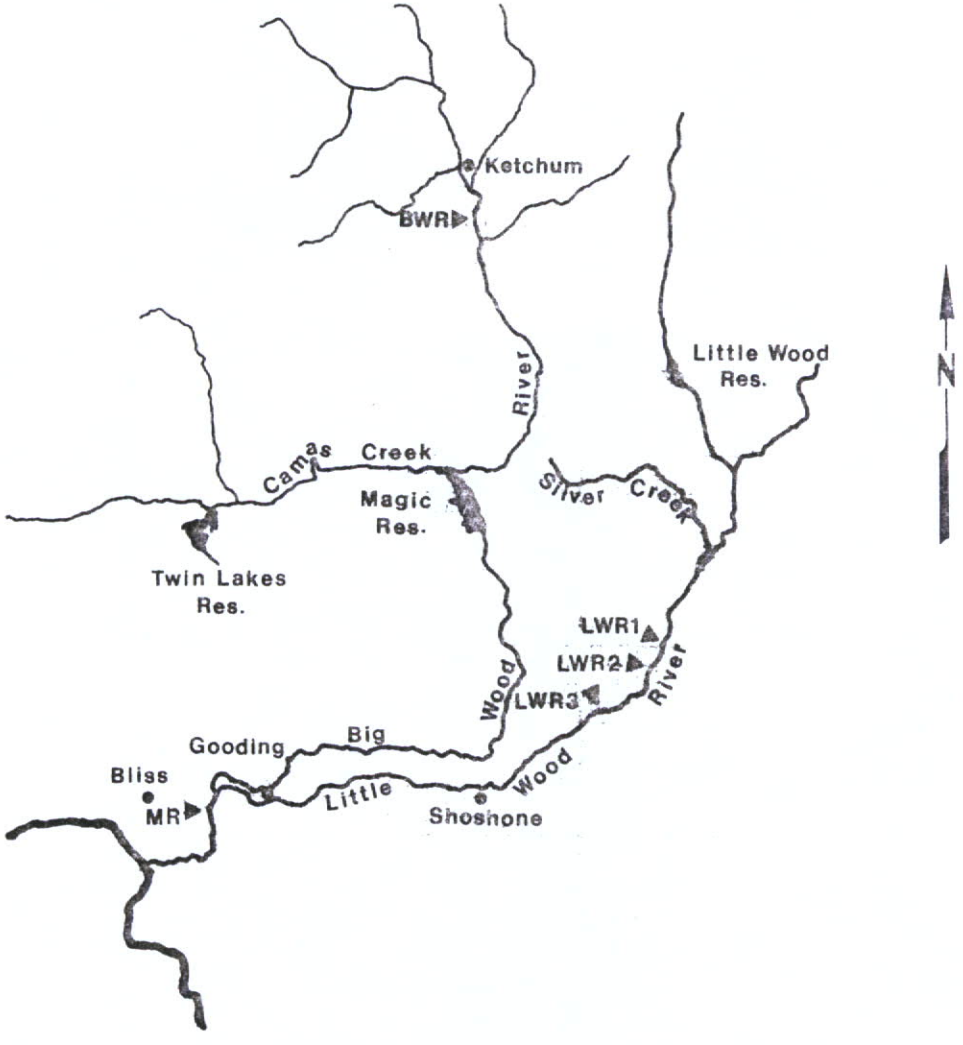


Figure 1. Locations of Grouse Creek and Lightning Creek study sites.

Figure 2. Locations of Malad River, Big Wood River and Little Wood River study sites.



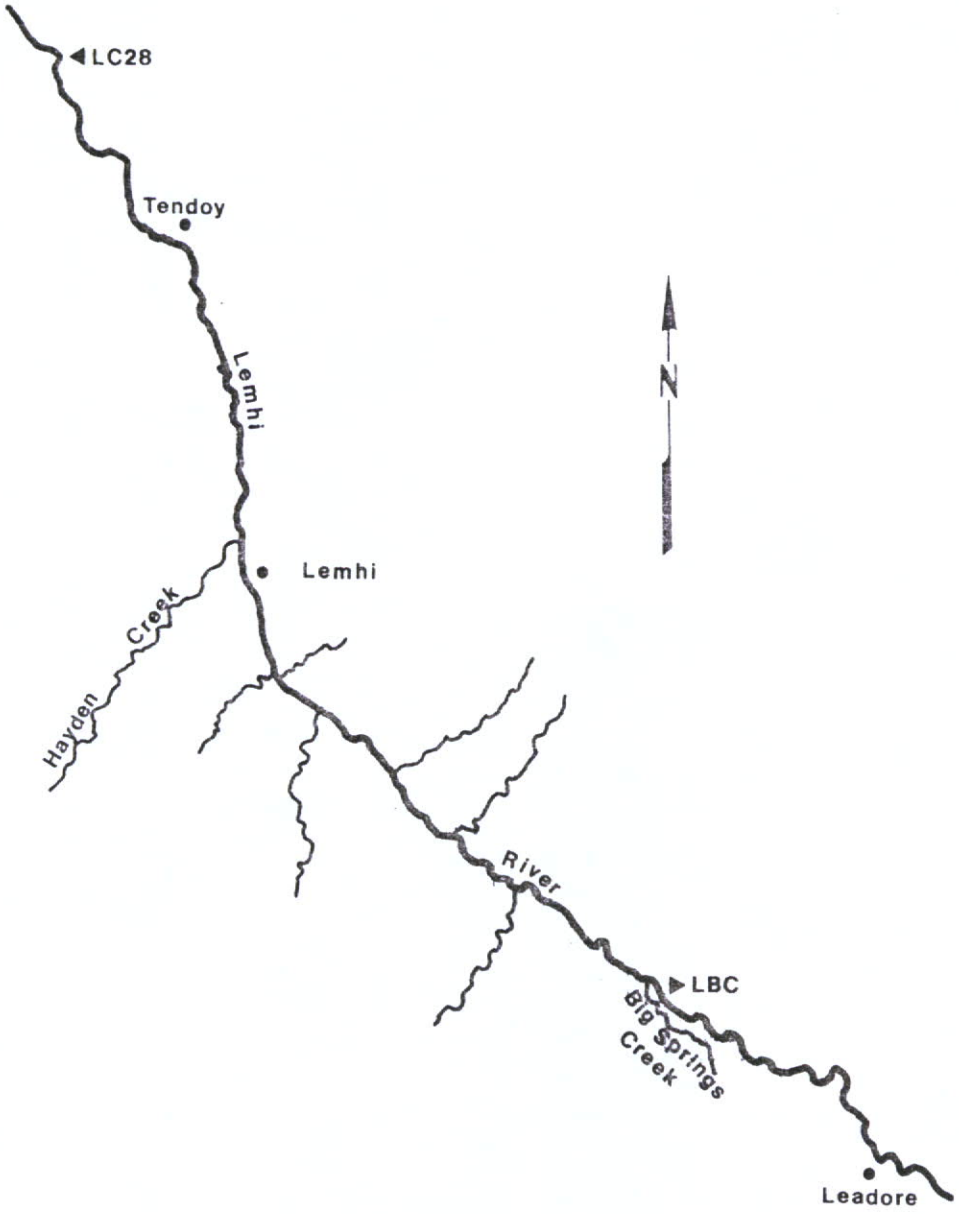


Figure 3. Locations of Lemhi River study sites.

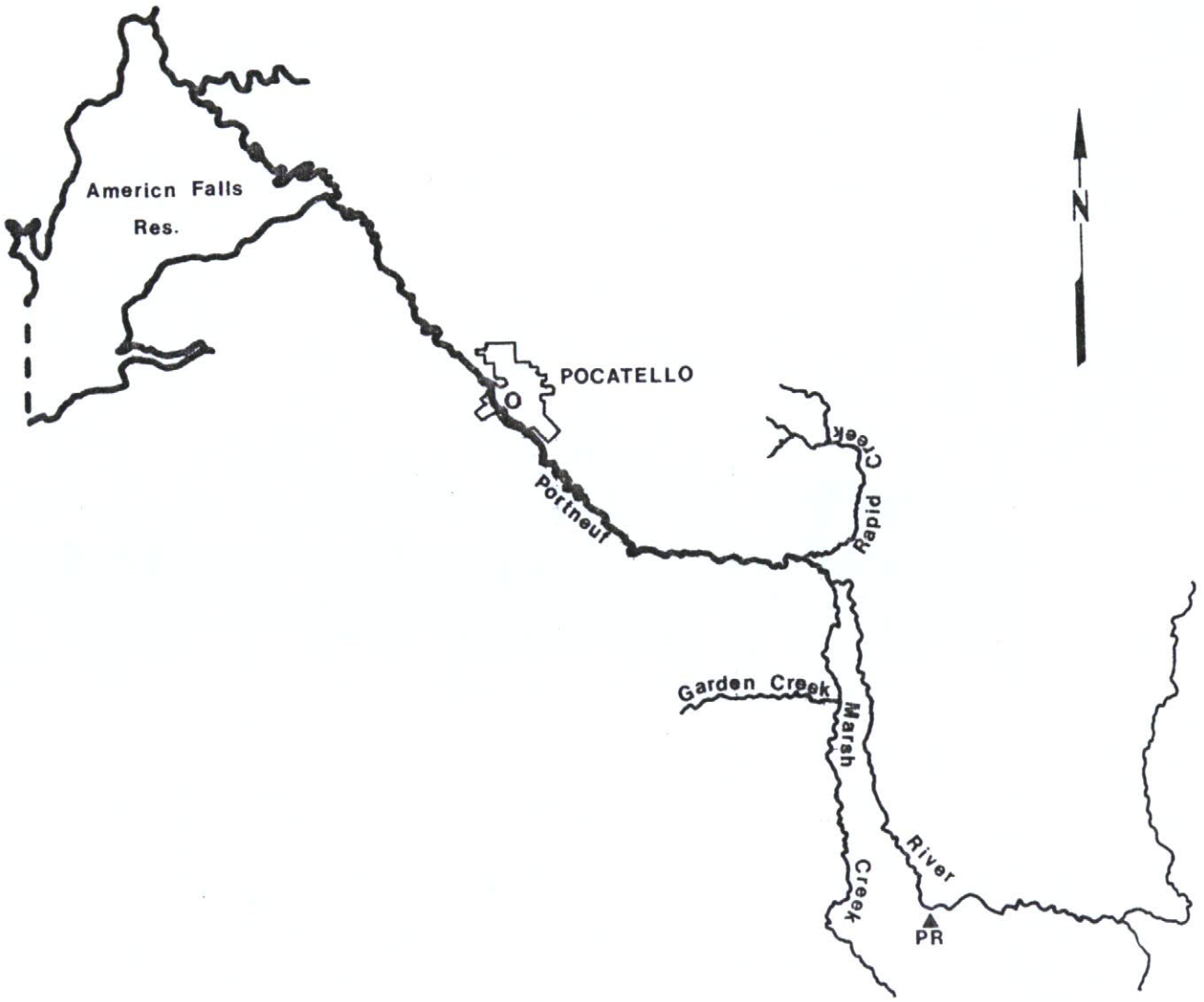


Figure 4. Location of Portneuf River study site.

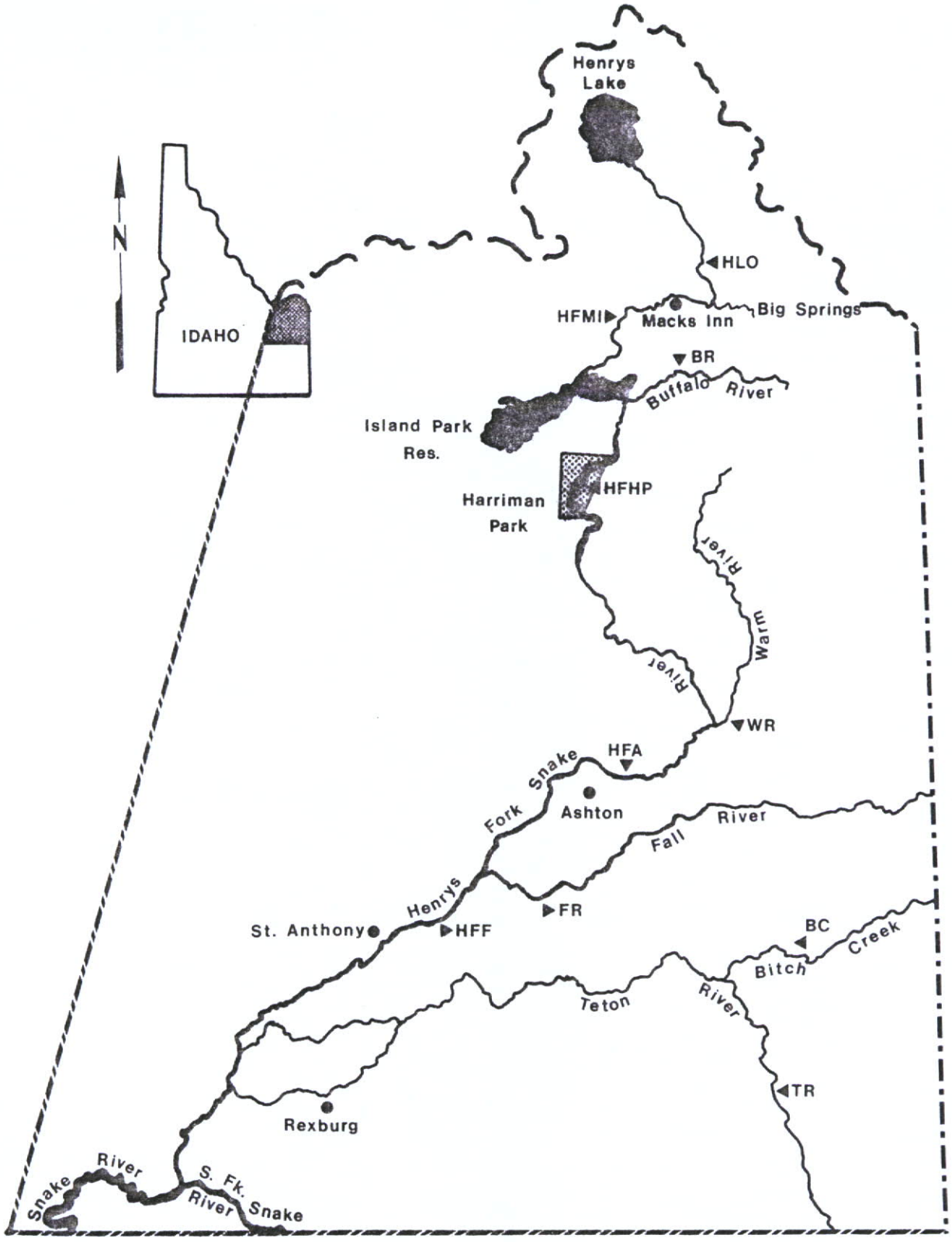


Figure 5. Locations of Henrys Fork Snake River and tributaries study sites.

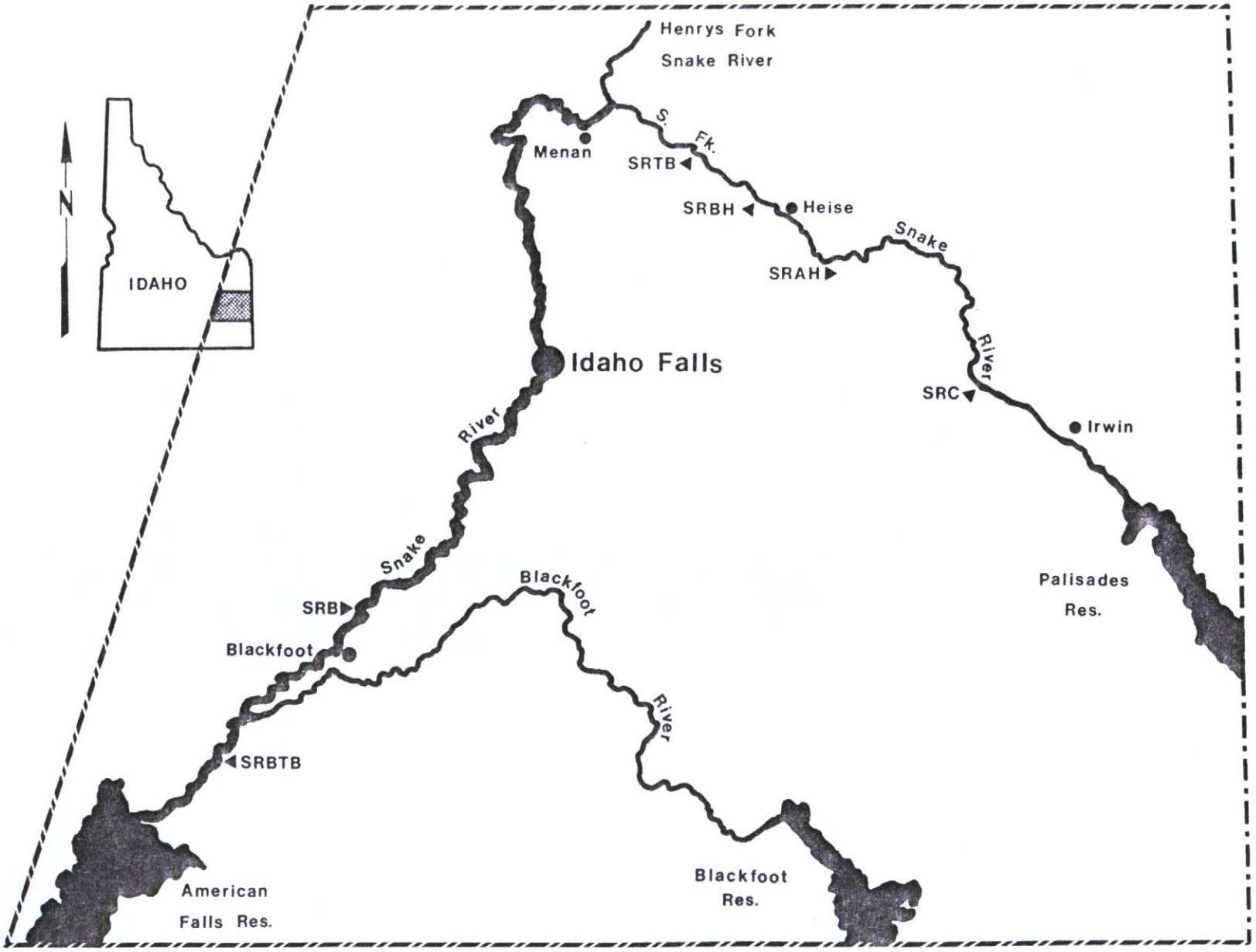
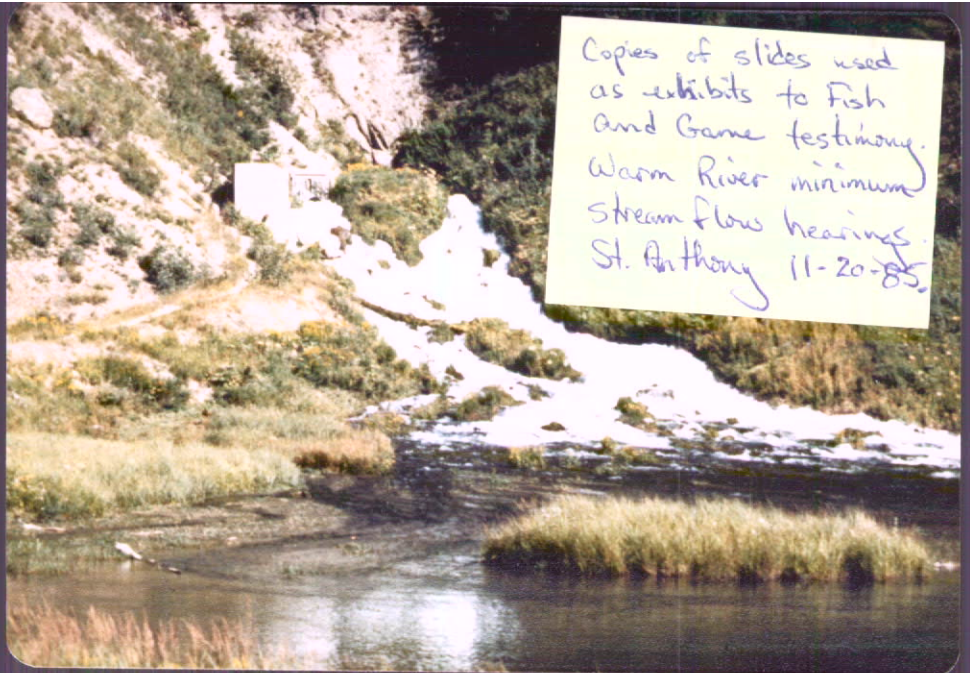


Figure 6. Locations of South Fork Snake River and main Snake River study sites.






Copies of slides used
as exhibits to Fish
and Game testimony.
Warm River minimum
stream flow hearings.
St. Anthony 11-20-85.

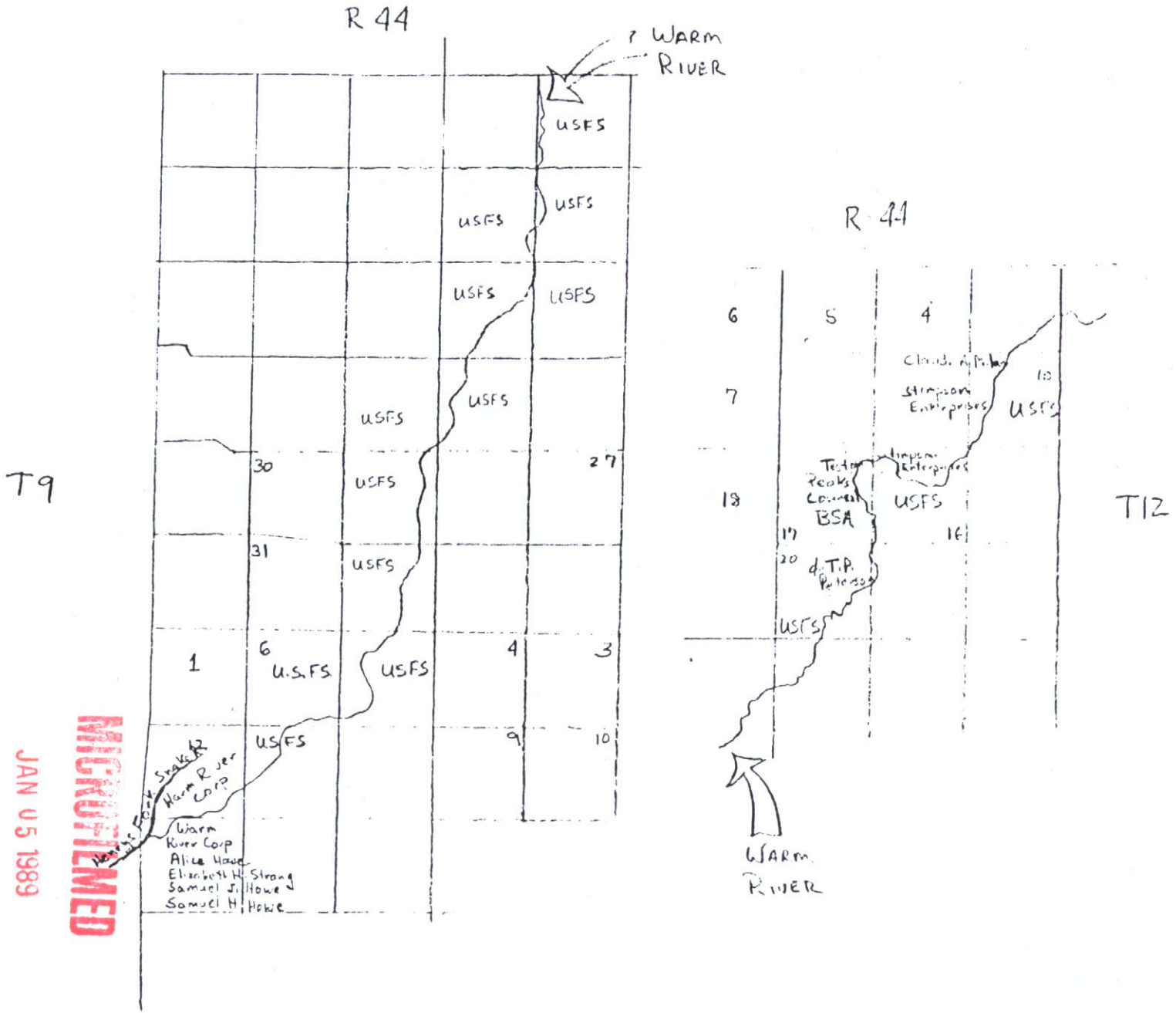




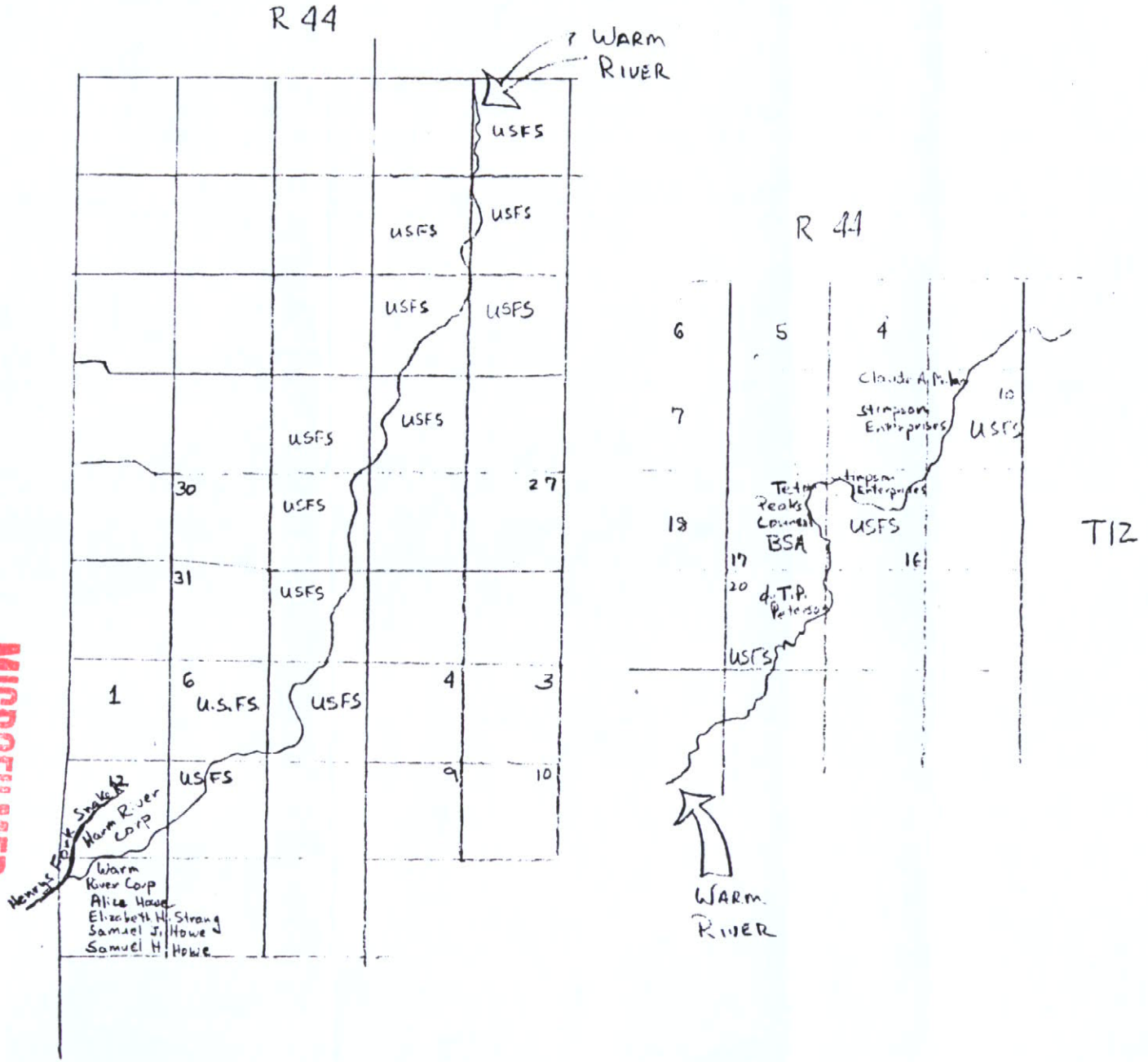


POPULATION ESTIMATES FOR WARM RIVER, 1982-1984

LOCATION	DATE	METHOD	# TROUT/KM	SPECIES COMPOSITION
Polebridge Campground GAWS	7/26/83	3-Pass	392	44% brook, 24% wild rainbow, 32% hatchery rainbow
	8/7-10/84	Mark-recapture	589	53% brook, 26% hatchery rainbow, 21% wild rainbow
GAWS above springs	7/27-29/83	Mark-recapture	400	48% brook, 36% wild rainbow, 12% brown, 3% hatchery rainbow
	8/7-10/84	Mark-recapture	208	42% brook, 32% wild rainbow, 19% hatchery rainbow, 5% hybrid, 1% brown
At Twisted Draw	8/28/84	Snorkel	1226	97% rainbow, 2% brook, <1% brown
Above cascade	8/3/82	Snorkel	1619	98% rainbow, 1% brook, <1% brown
	3/21/83	"	955	96% rainbow, 4% brook
	8/31/83	"	1866	97% rainbow, 3% brook, <1% brown
	7/18/84	"	954	95% rainbow, 5% brook
	8/28/84	"	1573	94% rainbow, 5% brook, <1% brown
Below cascade	8/30/83	Snorkel	380	100% rainbow
	7/18/84	"	235	99% rainbow, 1% brook
	8/29/84	"	1370	95% rainbow, 5% brook
Above Warm River Campground	7/19/84	Snorkel	563	97% rainbow, 2% brown, <1% brook
Fish Creek bridge to Three Rivers Ranch	7/2-12/84	Mark-recapture	605	46% wild rainbow, 33% brown, 18% hatchery rainbow, 2% brook,



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State of Idaho
Department of Water Resources

WATER RIGHT LICENSE

WATER RIGHT NO. 21-07283

Priority: June 19, 1981 Minimum Instream Flow: 141.00 CFS

This is to certify, that STATE OF IDAHO
IDAHO WATER RESOURCE BOARD
STATEHOUSE
BOISE ID 83720 has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated June 19, 1981; and has submitted Proof of Beneficial Use on February 22, 1994. A minimum stream flow in

WARM RIVER tributary to **HENRYS FORK**

has been established as follows:

BENEFICIAL USE	PERIOD OF USE	RATE
MINIMUM INSTREAM FLOW	01/01 to 12/31	141.00 CFS

LOCATION OF MINIMUM STREAM FLOW REACH:

Beginning of Stream Flow Reach SWSE , Sec. 12, Township 09N, Range 43E
End of Stream Flow Reach NWNW , Sec. 13, Township 09N, Range 43E
FREMONT County

CONDITIONS/REMARKS:

1. Use of water under this right shall be non-consumptive.
2. The use of water under this right shall recognize and allow the continued beneficial diversion of water for irrigation and other purposes under any prior existing water rights established by diversion and application to beneficial use or by any application, permit, or license on file or issued by the Director under the provisions of Chapter 2, Title 42, Idaho Code, with the priority of water right date earlier than 6/19/81.
3. Upon the future finding and order of the Director that gauging stations are required to determine the approved minimum flows on Warm River are being maintained, such measuring devices shall be permanently installed and maintained as specified by the Department.
4. This minimum flow is subordinated to the future construction of a dam on Warm River and storage behind the dam that might inundate portions or all of the proposed minimum flow reach. If the Board determines that a reservoir site on Warm River is no longer in the public interest, removal of the site from the State Water Plan will also remove the subordination of this minimum flow to the proposed reservoir.

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State of Idaho
Department of Water Resources

WATER RIGHT LICENSE

WATER RIGHT NO. 21-07283

CONDITIONS/REMARKS:

5. The Director retains jurisdiction, as decribed below, to review and amend any and all parameters of this right. The Board, upon receiving a request, or upon its own initiative, may petition the Director for an amendment to the right. The petition must set forth any significant change in circumstances and evidence of the public interest supporting the proposed amendment. The Director will notify the general public and specific persons or known interested parties of the proposed change, and conduct a hearing for the purpose of determining whether the right should be amended in the public interest. The burden of proof at the hearing shall be upon the persons or parties seeking the amendment to establish that the amendment of the right would be in the public interest.
6. This minimum stream flow reach is from State Highway 47 in the SWSE, S12, T9N, R43E, downstream to a point in the NWNW, S13, T9N, R43E.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. Witness the seal and signature of the Director, affixed at Boise, this 24TH day of AUGUST, 1995.

Acting for KARL J. DREHER, Director

SEP 14 1995

Form 217
11/91

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FEB 22 1994
Department of Water Resources

OFFICE USE ONLY
Amt. of Fee $_____
Date _____
Receipt No. _____
Receipt by _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

PROOF OF BENEFICIAL USE

The Idaho Department of Water Resources considers this form a statement that the permit holder(s) has/have completed all development that will occur under this permit and that water has been applied according to the provisions of the permit for the beneficial use(s) described below. This form must be accompanied by a license examination fee, when necessary, or a completed field examination report prepared by a certified water right examiner who has been appointed by the department.

1. Permit No. 21-07283 Telephone No. 208-327-7910

2. Name(s) of Permit Holder(s): Idaho Water Resource Board

3. Mailing Address: Statehouse, Boise, ID 83720

4. Source of Water: Warm River

   If **GROUNDWATER**, Well Driller's Name: _____ Date Drilled: _____

   OPTIONAL:
   Pump horsepower: _____ Pressure (psi): _____ Dynamic pumping level (ft.): _____

5. Extent of Use (as authorized by the permit):

   Domestic _____ (No. of households) Stockwater _____ (No. and type of stock)

   Irrigation _____ (No. of acres) Other Minimum Instream Flow

6. Total rate and/or volume for which proof is submitted 141.0 cfs **OR** _____ acre/feet

7. Refer to the approval conditions on your permit and respond accordingly:

   Measuring device: Required? ___ Yes X No Installed? ___ Yes ___ No

   OR

   Flow Measurement Port: Required? ___ Yes X No Installed? ___ Yes ___ No

8. Fee Enclosed: $ NA (See License Fee Schedule on back of Instruction Sheet)

9. Person to contact to accompany the Department representative during field examination of the water system.

   NA
   Name Telephone No.

   Address

10. The above information is my true statement of the extent to which the above numbered permit has been developed and I relinquish any undeveloped portion of the permit to the state of Idaho.

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APR 07 1994

2/17/94 F. Dove Bydalch Chair IWRB
Date Signature (and title, if on behalf of a company or organization)

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE

STATE OF IDAHO

IN THE MATTER OF APPLICATION FOR PERMIT NO. 21-7283 & 21-7355 (WARM RIVER) TO ESTABLISH A MINIMUM STREAMFLOW IN THE NAME OF THE IDAHO WATER RESOURCE BOARD	ORDER ADOPTING PROPOSED MEMORANDUM DECISION AND ORDER

WHEREAS, a Proposed Memorandum Decision and Order in the above-captioned matter has been issued and a copy served on the parties; and,

WHEREAS, more than fifteen days have passed since the service of the Proposed Memorandum Decision and Order; and,

WHEREAS, no exception to that Proposed Memorandum Decision and Order has been received;

IT IS, THEREFORE, HEREBY ORDERED that said Proposed Memorandum Decision and Order be adopted and issued as the Final Decision and Order and proof of construction of works and application of water to beneficial use shall be submitted on or before April 1, 1994.

Dated this 23RD day of DECEMBER, 1988.

R. KEITH HIGGINSON
Director

RECORDED

JAN 06 1989

CERTIFICATE OF MAILING

I certify that on the 23rd day of December, 1988, I mailed a true and correct copy, postage prepaid, of the Order Adopting Proposed Memorandum Decision and Order to:

Leigh Chantrill
Newdale, ID 83436

Dave Rydalch
Rt. 2 Box 108
St. Anthony, ID 83445

Idaho Dept. of Fish & Game
Steve Goddard
Box 25
Boise, ID 83720

Ted Sorenson
550 Linden
Idaho Falls, ID 83401

Gene Gray
2393 Watts Lane
Payette, ID 83661

Diana Schuett
DIANA SCHUETT, Clerical Assistant

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BEFORE THE DIRECTOR OF THE DEPARTMENT

OF WATER RESOURCES OF THE

STATE OF IDAHO

IN THE MATTER OF APPLICATION FOR PERMIT NOS. 21-7283 AND 21-7355 (WARM RIVER) TO ESTABLISH A MINIMUM STREAMFLOW IN THE NAME OF THE IDAHO WATER RESOURCE BOARD	ORDER ISSUING PROPOSED MEMORANDUM DECISION

R. Keith Higginson, Director of the Department of Water Resources, having reviewed the attached proposed decision prepared by his appointee, Bobby D. Fleenor, who conducted the hearing or who has read the record in the this case, hereby approves the same as a proposed decision pursuant to Idaho Code, Sec. 67-5211.

Each party to these proceedings who appeared at the hearing is given the opportunity, pursuant to Idaho Code, Sec. 421701A and 67-5211, to file exceptions to the proposed decision and to present briefs and oral arguments. If no timely and proper exceptions are received, an order by the Director will be entered adopting the proposed decision as his final decision.

I.
EXCEPTIONS

A. To be considered by the Director, exceptions must:

1. be received by the Director on or before the 15th day following the day of service of this Order and the proposed decision,

2. specifically identify the portions of the proposed decision to which exceptions are made and specifically state the grounds for those exceptions, and

3. be sent to each of the parties who appeared or their attorneys.

II.
BRIEFS

A. Any briefs in support of exceptions to the proposed decision shall be filed with the Director at the same time that party's exceptions are filed with the Director.

B. All response briefs to the exceptions must be filed with the Director within 15 days after the exceptions were served upon the responding party.

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III.

A. No oral arguments before the Director on the proposed decision will be held unless specifically requested by a party filing exceptions to the proposed decision and unless that request is filed with the Director concurrently with the filing of that party's exception.

B. If oral arguments have been properly requested by a party filing exceptions, any other party, upon reasonable notice to the Director, shall have the right to present oral argument in response to the exceptions filed.

C. Oral arguments before the Director on exceptions to the proposed decision shall be heard at the discretion of the Director, pursuant to Idaho Code, Sec. 42-1701A. If oral arguments are to be heard, the Director will, within a reasonable time, notify each party of the place, date and hour the oral arguments will take place and of the period of time allocated for the arguments of this case. Unless the Director orders otherwise, all oral arguments shall be heard in Boise, Idaho.

IV.
CERTIFICATE OF SERVICE

All exceptions, briefs, requests oral arguments and other matters filed with the Director in connection with the proposed decision shall be served on all other parties to these proceedings in accordance with Rule 7.2.

V.
FINAL DECISION

Following the submission of all exceptions, briefs and oral arguments, if they are heard, the Director shall issue a final decision adopting, modifying or rejecting and replacing the proposed decision. Copies of the decision and order shall be served on all parties.

Dated this 5th day of December, 1988.

R. KEITH HIGGINSON
Director

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BEFORE THE DIRECTOR OF THE DEPARTMENT OF WATER RESOURCES
STATE OF IDAHO

IN THE MATTER OF APPLICATIONS FOR FOR PERMIT NOS. 21-7283 AND 21-7355 (WARM RIVER) TO ESTABLISH A MINIMUM STREAMFLOW IN THE NAME OF THE IDAHO WATER RESOURCE BOARD	PROPOSED MEMORANDUM DECISION AND ORDER

On June 19, 1981, the Idaho Water Resource Board (Board) filed with the Idaho Department of Water Resources (Department) Application for Permit to Appropriate Water No. 21-7283, seeking to preserve a minimum streamflow on Warm River which is tributary to Henrys Fork, Snake River. The application proposed the establishment of a minimum streamflow in the reach of Warm River beginning at the confluence with the Henrys Fork,and extending upstream about one half mile to the Idaho State Highway 47 bridge.

On September 27, 1984, the Board filed an additional Application for Permit to Appropriate Water No. 21-7355 with the Department, which seeks to preserve a minimum flow in an additional eight miles of Warm River. The additional proposed minimum flow reach begins at State Highway 47 bridge, the upstream end of the reach proposed under Application No. 21-7283, and extends upstream to Warm River Springs.

Both applications seek a flow of 141 cubic feet per second (cfs) for the purpose of maintaining high quality fisheries and spawning and rearing habitat.

JAN [illegible] 1989

The Department consolidated the hearings on the two applications because they were for adjoining reaches of the same stream. Notice of the time and place of hearings was properly published. A public hearing was held in St. Anthony, Idaho, on November 20, 1985. Bobby D. Fleenor of the Department served as hearing officer.

Parties appearing in a formal capacity at the hearing included the Board which is the applicant, the Idaho Department of Fish and Game (Fish & Game), which supported the minimum flow and was the entity that requested the application be filed by the Board, and Leigh Chantrill, who opposed the application because it might prevent the water from being used for some future beneficial purpose. Other individuals and representatives of organizations also appeared and presented their views and comments as public witnesses with some for and some against the application.

After the close of the hearing, the record remained open for (15) fifteen days for the submission of additional written materials.

Based upon the sworn testimony, documentation, public statements included in the record, and upon his understanding of the facts and the law, the hearing officer, as a representative of the Director of the Department, finds, concludes, and orders as follows:

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FINDINGS OF FACT

1. Application for Permit No. 21-7283 proposes a minimum streamflow of 141 cfs in the reach beginning in the NW¼NW¼, Sec.

13, T9N, R43E, B.M., Fremont County, at the confluence of Warm River and Henrys Fork, and extending upstream approximately one-half mile to the intersection of State Highway 47 with Warm River located in the SW¼SE¼, Sec. 12, T9N, R43E, B.M., Fremont County.

2. Application for Permit No. 21-7355 proposes the establishment of a minimum streamflow of 141 cfs from the intersection of State Highway 47 and Warm River, located in the SW¼SE¼, Sec. 12, T9N, R43E, B.M., Fremont County, and extending upstream approximately eight (8) miles to a point where the flows from Warm River Springs discharge into Warm River, located within the NW¼SW¼, Sec. 10, T10N, R44E, B.M., Fremont County.

3. Historical records from 1912 through 1932 reveal that flows dropped below the requested minimum streamflow rate on only two occasions.

4. Fish & Game modeled the flows on Warm Springs to determine the minimum streamflow below which a substantial loss of fish habitat and aquatic food growth would occur. The studies were limited to four transects located in the lower one-half mile reach that is defined by Application for Permit No. 21-7283. Based upon Fish & Game studies, 141 cfs is the minimum streamflow in the one-half mile reach proposed by Application for Permit No. 21-7283 and is not the optimum or most desirable streamflow.

5. Warm River is an extraordinary river because of its constant flow, and the high quality of its water. Large numbers of fish residing in Henrys Fork spawn in Warm River

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6. Angler use is approximately 4,000 to 5,000 angler days per year. The river is heavily fished, particularly the lower reach defined by Application No. 21-7283.

7. The transects used for determination of a minimum flow do not represent the entire reach of river flow for which a minimum streamflow is being sought. The lower portion, where all the transects were located, is open and flows more slowly, while the upper portion which was not evaluated by using transects is more narrow and turbulent.

8. Only two water rights were found that list points of diversion within the proposed minimum flow reach. The diversions for those water rights are small, are prior in time, and will not affect the proposed minimum flows.

9. Policy 4D of the Idaho State Water Plan lists a portion of the proposed minimum streamflow reaches as a possible reservoir site. The Board requested that the minimum flow be subordinated to the proposed reservoir.

CONCLUSIONS OF LAW

1. Idaho Code § 42-1501 provides that streamflow preservation for the protection of fish and wildlife habitat, and recreation, is in the public interest and is declared to be a beneficial use of such water.

2. Idaho Code § 42-1503 sets forth the criteria to be considered by the Department in reviewing an application for minimum streamflow:

> Upon the conclusion of the hearings and completion of any investigation conducted by the director, he shall enter his findings in writing approving the application in whole, or in part, or upon conditions or rejecting said

DISAPPROVED
JAN 06 1989

application. Approval of any such application must be based upon a finding that such appropriation of minimum streamflow:

(a) will not interfere with any vested right, permit, or water right application with priority of right dated earlier than the date of receipt in the office of the director of a complete application for appropriation of minimum streamflow filed under the provisions of this act;

(b) is in the public as opposed to private, interest;

(c) is necessary for the preservation of fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, navigation, transportation, or water quality of the stream;

(d) is the minimum flow or lake level and not the ideal or most desirable flow or lake level; and,

(e) is capable of being maintained as evidence by records of stream flows, water levels, and the existing or future establishment of necessary gauging stations and bench marks.

3. Any right to be acquired under the application is for instream non-consumptive use and is subject to all vested water rights, permits, or water right applications having dates of priority earlier than June 19, 1981 for Application No. 21-7283 and September 27, 1984 for Application No. 21-7355.

4. A minimum streamflow appropriation is necessary to preserve recreational value and fish and wildlife habitat.

5. The establishment of a minimum streamflow on Warm River is in the public as opposed to the private interest.

6. Policy 4D of the Idaho State Water Plan lists potential reservoir sites which should be protected from significant land use change. Policies set forth in the State Water Plan are deemed to be statements of public interest. Warm River is one of the sites specifically listed in Policy 4D.

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7. The minimum flow on Warm River was modeled using transects from only the one half mile reach sought under Application No. 21-7283.

8. The minimum streamflow of 141 cfs is a true minimum, and not the ideal or most desirable flow for the minimum flow reach from the confluence of Warm River with Henrys Fork to the intersection of Warm River with State Highway 47, the minimum flow reach identified by Application No. 21-7283.

9. In the eight mile reach identified under Application No. 21-7355, however, the stream channel characteristics are dramatically different than the reach identified by Application No. 21-7283 and representative transects must be identified and the flow modeled to establish a minimum and not an optimum flow.

10. The minimum flow sought is capable of being maintained.

11. The Director of the Department of Water Resources has considerable flexibility and authority to grant appropriations subject to future appropriations for uses which the public interest may show to be of greater importance. Shokal v. Dunn, 109 Idaho 330, 337, 707 P.2d 441 (1985).

12. A perpetual commitment of a significant amount of water from Warm River without a workable method of changing the terms of that use could at some future date adversely affect the public interest.

ORDER

IT IS HEREBY ORDERED that Applications for Permit Nos. 21-7283 and 21-7355 are APPROVED subject to the following conditions:

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1. The use of water under the permits shall recognize and allow the continued beneficial diversion of water for irrigation and other purposes under any prior existing water rights established by diversion and application to beneficial use or by any application, permit, or license on file or issued by the Director under the provisions of Chapter 2, Title 42, Idaho Code, with the priority of water right date earlier than June 19, 1981, for Application No. 21-7283 and September 27, 1984, for Application No. 21-7355.

2. Upon the future finding and order of the Director that gauging stations are required to determine the approved minimum flows on Warm River are being maintained, such measuring devices shall be permanently installed and maintained as specified by the Department.

3. The Director retains jurisdiction to review and amend any and all parameters of this permit and subsequent license. Any person seeking review and amendment of the permit or license shall file a request with the Board, which request shall describe the amendment sought, the reasons for the proposed amendment, and a statement of the change in circumstances since the permit or license was issued or last reviewed that merit a review of the permit or license. A copy of the petition shall be served upon the Director of the Department of Water Resources. The Board, upon receiving a request, or upon its own initiative, may petition the Director for an amendment to the permit or license. The petition must set forth any significant change in

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circumstances and evidence of the public interest supporting the proposed amendment. The Director will notify the general public and specific persons or known interested parties of the proposed change, and conduct a hearing for the purpose of determining whether the permit or subsequent license should be amended in the public interest. The burden of proof at the hearing shall be upon the person or party seeking the amendment to establish that amendment of the permit or license would be in the public interest.

4. Proof of instream beneficial use of the minimum streamflow appropriated shall be submitted in a manner approved by the Department within 5 (five) years after the permit approval is finally effective as herein provided. Proof shall be filed in the following manner:

Application No. 21-7283

Sufficient proof of beneficial use has been made regarding the extent of use, the availability of flows, and finally, the establishment of a minimum flow through professional studies so that no further studies or data will be required for filing of proof. Following affirmative action by the legislature, proof can be filed on Application No. 21-7283.

Application No. 21-7355

Sufficient proof has been filed with the Department regarding the need of a minimum flow for fish habitat and recreational values, and the availability of flows in Warm River. Following affirmative action by the legislature, information

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sufficient to establish the minimum, not optimum, flow shall be submitted to the Department with proof of beneficial use.

This minimum flow is subordinated to the future construction of a dam on Warm River and storage behind the dam that might inundate portions or all of the proposed minimum flow reach. If the Board determines that a reservoir site on Warm River is no longer in the public interest, removal of the site from the State Water Plan will also remove the subordination of this minimum flow to the proposed reservoir.

Dated this 28 day of November, 1988.

Bobby D. Fleenor
BOBBY D. FLEENOR, Hearing Officer
Department of Water Resources

CERTIFICATE OF MAILING

I hereby certify that on the 28th day of November, 1988, I mailed a true and correct copy, postage prepaid, of this Proposed Memorandum Decision and Order to:

Leigh Chantrill
Newdale, ID

Idaho Fish & Game
Steve Goddard
Box 25
Boise, ID 83720

Gene Gray
2393 Watts Lane
Payette, ID 83661

Dave Rydalch
Rt. 2, Box 108
St. Anthony, ID 83445

Ted Sorenson
550 Linden
Idaho Falls, ID 83401

Heidi Miller
HEIDI MILLER, Receptionist

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Form 202
3/78

21 7283

Ident. No. _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT

To appropriate the public waters of the State of Idaho

1. Name of applicant Idaho Water Resource Board Phone 384-2215

   Post office address Statehouse, Boise, Idaho 83720

2. Source of water supply Warm River which is a tributary of Henrys Fork Snake River

3. Location of reach is from NW ¼ of NW ¼ of Section 13 Township 9 N

   Range 43 E B.M Fremont County, upstream approximately 1/2 mile to State Highway 47 in SW¼SE¼ Sec. ~~18~~ 12 OK (9-27-84) T9N R43E B.M., Fremont County.

4. Water will be used for the following purposes:

   Amount 141 (cfs or acre-feet per annum) for instream flow purposes from Jan. 1 to Dec. 31 (both dates inclusive)

   Amount _____ (cfs or acre-feet per annum) for _____ purposes from _____ to _____ (both dates inclusive)

   Amount _____ (cfs or acre-feet per annum) for _____ purposes from _____ to _____ (both dates inclusive)

   Amount _____ (cfs or acre-feet per annum) for _____ purposes from _____ to _____ (both dates inclusive)

5. Total quantity to be appropriated:

   a. _____ cubic feet per second and/or b. _____ acre-feet per annum.

6. Proposed diverting works:

   a. Description of ditches, flumes, pumps, headgates, etc. _____

   b. Height of storage dam _____ feet, active reservoir capacity _____ acre-feet; total reservoir capacity _____ acre-feet, materials used in storage dam: _____

      Period of year when water will be diverted to storage _____ (Month/Day) to _____ (Month/Day) inclusive.

   c. Proposed well diameter is _____ inches; proposed depth of well is _____ feet.

7. Time required for the completion of the works and application of the water to the proposed beneficial use is 5 years *(minimum 1 year – maximum 5 years).*

8. Description of proposed uses:
   a. If water is **not** for irrigation:
      (1) Give the place of use of water: NW ¼ of NW ¼ of Section 13 Township 9 N

      Range 43 E B.M.

      (2) Amount of power to be generated: _____ horsepower under _____ feet of head.

      (3) List number of each kind of livestock to be watered _____

      (4) Name of municipality to be served _____, or number of families to be supplied with domestic water _____.

      (5) If water is to be used for other purposes describe: To maintain high quality fisheries and spawning and rearing habitat from the point of requested flow upstream to State Highway 47.

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b. If water is for irrigation, indicate acreage in each subdivision in the tabulation below:

TWP	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SE¼	SW¼	

Total number of acres to be irrigated _____

c. Describe any other water rights used for the same purposes as described above. None

9. a. Who owns the property at the point of diversion _____

b. Who owns the land to be irrigated or place of use _____

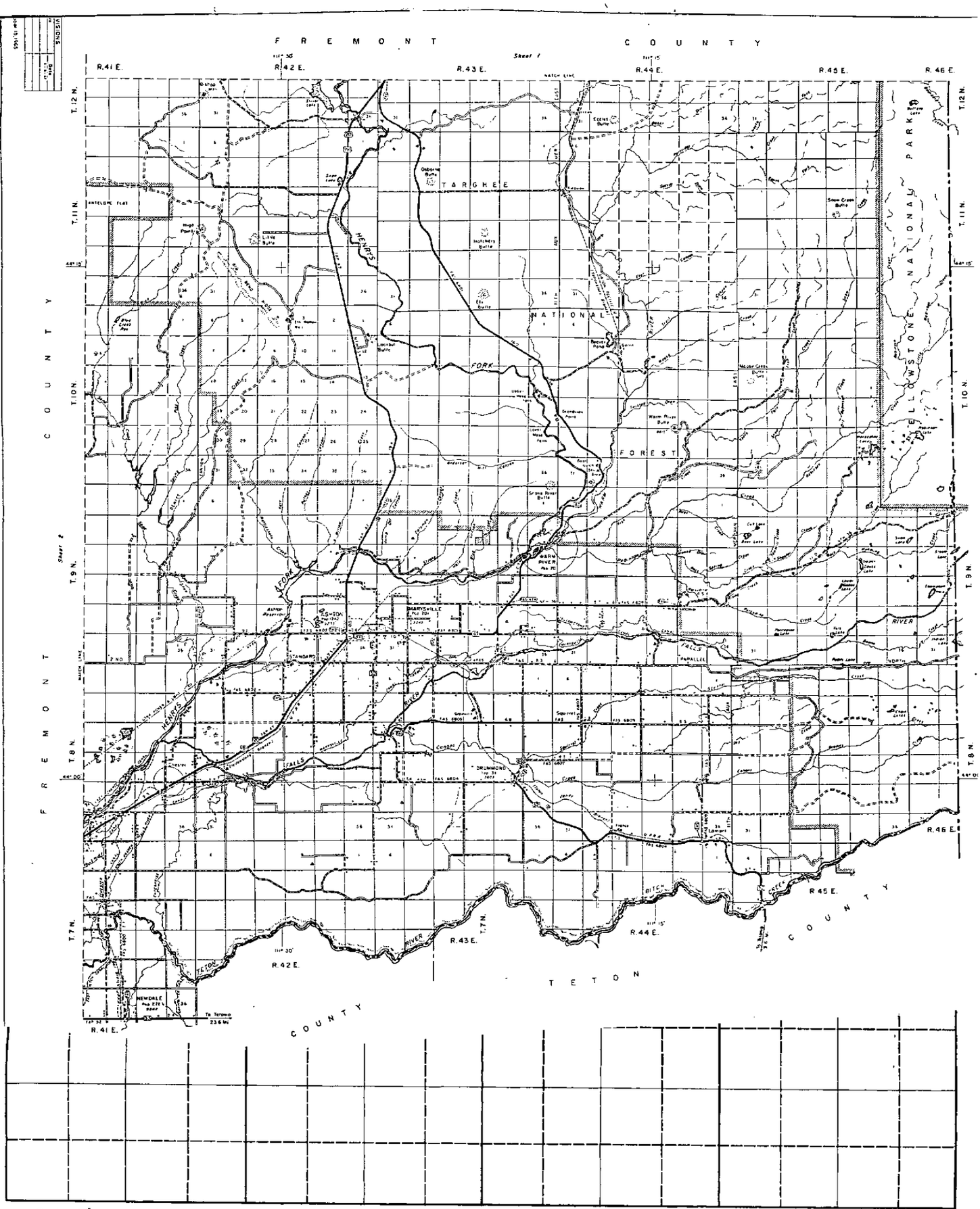
c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing _____

10. Remarks _____

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JAN 06 1989

11. Map of proposed project: show clearly the proposed point of diversion, place of use, section number, township and range number.



Scale: 2 inches equal 1 mile.

BE IT KNOWN that the undersigned hereby makes application for permit to appropriate the public waters of the State of Idaho as herein set forth.

MICROFILMED
JAN 06 1989

M. Reed Hansen
(Applicant)

Chairman

Idaho Water Resource Board

Received by KW Date 7/1/81 Time 10:40 A.
6-19-81 1:28 P.

Preliminary check by EMC Fee $ N/A

Receipted by _____ Date _____

Publication prepared by KW Date 8/5/81

Published in Ashton Herald

Publication dates 8/13 & 8/20/81 & 10/17 & 10/24/85

Publication approved KW Date 9/08/81
11-12-85

Protests filed by: _____

RE-AD in:
Post Register
Ashton Herald,
Fremont Cty Chron.
Idaho Statesman
Lewiston Morn. Trib
Times News

Copies of protests forwarded by _____

Hearing held by _____ Date _____

Recommended for approval denial by _____

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

This is to certify that I have examined Application for Permit to appropriate the public waters of the State of Idaho No. _____, and said application is hereby _____.

1. Approval of said application is subject to the following limitations and conditions:

   a. SUBJECT TO ALL PRIOR WATER RIGHTS.

   b. Proof of construction of works and application of water to beneficial use shall be submitted on or before _____, 19____.

   c. The rate of diversion, if water is to be used for irrigation under this permit, when combined with all other water rights for the same land shall not exceed 0.02 cubic feet per second for each acre of land.

   d. Other: Pursuant to PROPOSED MEMORANDUM DECISION AND ORDER and ORDER ADOPTING PROPOSED MEMORANDUM DECISION AND ORDER

Witness my hand this 23rd day of Decmeber, 19 88.

R. Keith Higginson
Director

MICROFILMED
JAN 06 1989

NAME OF STREAM - Warm River, a tributary of Henry's Fork Snake River.

LEGAL DESCRIPTION OF THE POINT OF THE STREAM WHERE STREAM FLOW IS REQUESTED - At mouth, Fremont County, NW¼NW¼ Sec. 13, T9N., R43E.

THE PROPOSED STREAM FLOW IN CUBIC FEET PER SECOND - 141 cfs.

THE PURPOSE FOR WHICH THE MINIMUM STREAM FLOW IS PROPOSED - To maintain high quality fisheries and spawning and rearing habitat from the point of requested flow upstream to State Highway 47.

THE PERIOD OF TIME OR SEASON OF YEAR DURING WHICH APPROPRIATION IS PROPOSED - All year.

EVIDENCE THAT THE APPROPRIATION WILL NOT INTERFERE WITH ANY VESTED WATER RIGHT, PERMIT OR WATER APPLICATION OF EARLIER DATE OF PRIORITY.- The above requested flow is for instream nonconsumptive use and will be subject to all vested water rights, permits or water applications of earlier dates of priority.

EVIDENCE THAT THE APPROPRIATION WOULD BE IN THE PUBLIC INTEREST AS OPPOSED TO PRIVATE INTEREST - Warm River supports a high quality fishery. Sections of the river are being managed as a high quality and trophy fish fishery for rainbow trout.

The requested instream flow water right will be held in trust for the people of Idaho by the Idaho Water Resource Board.

EVIDENCE OR JUSTIFICATION THAT THE APPROPRIATION IS NECESSARY FOR THE PURPOSES SHOWN ABOVE - During 1977, personnel of the Idaho Department of Fish and Game collected field data for use with instream flow methodologies in the determination of necessary flows for fish and wildlife resources.

Methodologies, techniques and flow recommendations are provided in the following publication:

Cochnauer, Tim and Edwin Buettner. 1978. Stream Resource Maintenance Flow Determinations on Idaho Streams. Job Performance Report. Project F-69-R-3, Job II. Idaho Department of Fish and Game. 88 pp.

EVIDENCE THAT THE REQUESTED FLOW IS MINIMUM AND NOT THE IDEAL OR MOST DESIRABLE FLOW - The ideal flow would be bank full discharge or approximately 350 cfs.

EVIDENCE THAT THE REQUESTED FLOW IS CAPABLE OF BEING MAINTAINED AS EVIDENCED BY RECORDS OF STREAM FLOWS - No flow records are available.

LOCATION OF EXISTING GAGEING STATION THAT CAN BE USED IN THE ADMINISTRATION OF THIS APPROPRIATION - None.

MICROFILMED

JAN 06 1989

AFFIDAVIT OF PUBLICATION

State of Idaho)
) ss.
County of Fremont)

Carol Bessey, her being first duly sworn, upon ~~his~~ oath, deposes and says:

That She is the Editor of The Ashton Herald, a newspaper as defined by Idaho Codes Annotated, section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at St. Anthony, in Fremont County, Idaho, having a general circulation in said county, and that said newspaper has been printed and published as a weekly newspaper in said county for more than 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of Notice of Application for Minimum Stream Flow #21-7283

And affiant further says that said notice, advertisement of publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issue thereof, for 2 consecutive issues thereof; first publication having been made on the 13 day of August, 1981, and the last publication on the 20 day of August 1981.

And affiant further says that at the times herein mentioned said newspaper was made up of at least four pages of at least five columns each, printed from type matter, of at least seventeen and three-fourths inches deep.

Carol Bessey

Subscribed in my presence and sworn to before me this 1st day of Sept, 1981.

Linda Sheldon

[SEAL] Notary Public for the State of Idaho, residence and post office address: ~~St. Anthony~~ Ashton, Idaho.

RECEIVED
SEP 3 1981
Department of Water Resources
Eastern District Office

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the following application has been submitted for permit to appropriate the public waters of the State of Idaho:

Notice is hereby given that the Idaho Water Resource Board has on June 19, 1981 submitted application 21-7283 for a permit to the Department of Water Resources proposing the appropriation of 141 cubic feet per second of water within the NW¼NW¼, Sec. 13, Twp. 9N Rge. 43E, Fremont County to preserve the minimum stream flow subject to all prior water rights for maintaining the present quality of fisheries and provide adequate spawning and rearing conditions year around in Warm River tributary of Henry's Fork Snake River.

Pursuant to Title 42, Chapter 15 of the Idaho Code a legal notice will be published at a later date setting a time and place for a hearing during which opportunity will be provided for public comment.

A. KENNETH DUNN
Director

Publ. Aug. 13 and 20, 1981AH

MICROFI
JAN 06

THE CHRONICLE-NEWS

ST. ANTHONY, IDAHO

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO } ss
County of Fremont }

I, Terry Weatherston, being first duly sworn, depose and say, that I am the printer of THE CHRONICLE-NEWS, a weekly newspaper printed and published weekly at St. Anthony, Fremont County, Idaho; and I do solemnly swear that the

Notice Of Public Meeting

a copy of which notice appears attached hereto, was published in the regular and entire issue of said newspaper, and not in any supplement issue thereof for 2 consecutive issues, the first publication having been made on September 13, 1984 and the last publication having been made on September 20, 1984.

Further, that said newspaper is one of general circulation in said county; that it is a legal newspaper, conforming to legal specifications under the Idaho Statutes; that it has at least two hundred bona fide subscribers living within the county of publication; and that it has been continuously and uninteruptedly published in said county during a period of seventy-eight consecutive weeks prior to the first publication of the said notice.

Terry Weatherston

Subscribed to and sworn to before me this September 21, 1984

Notary Public

(SEAL)

My commission expires life

NOTICE OF PUBLIC MEETING

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

No. 21-7281 proposing the appropriation of 140 cfs of water from Fall River tributary to Henry's Fork Snake River. The location of the reach is the NE¼SE¼, Sec. 14, T. 8N, R. 41E, upstream approximately 8 miles to State Highway 32 in the SE¼NW¼, Sec. 18, T. 8N, R. 43E.

No. 21-7283 proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NW¼, Sec. 13, T. 6N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SW¼SE¼, Sec. 12, T. 9N, R. 43E, B.M., both in Fremont County.

On Thursday, September 27, 1984 at 7:30 p.m. in the Courtroom, Teton County Courthouse, Driggs, Idaho an additional public meeting will be held to receive comments on minimum streamflow applications as follows:

No. 22-7369 proposing the appropriation of 106 cfs from Teton River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 9 miles to State Highway 33 in the SE¼SW¼, Sec. 23, T. 6N, R. 44E.

No. 22-7370 proposing the appropriation of 28 cfs from the Bitch Creek tributary to Teton River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 3 miles to State Highway 33 in the NW¼NW¼, Sec. 17, T. 7N, R. 45E, B.M., both in Teton County.

All of the above applications were filed to protect the quality of the waters listed above for the purpose of recreation and fish and wildlife.

GARY SPACKMAN
Director
Idaho Water Resource Board, Boise, Idaho

RECEIVED

OCT 4 1984

Department of Water Resources
Eastern District Office

RECEIVED

JAN 06 1989

AFFIDAVIT OF PUBLICATION

State of Idaho } ss.
County of Fremont }

Carol Bessey

being first duly sworn, upon his oath, deposes and says:

That She is the Editor of The Ashton Herald, a newspaper as defined by Idaho Codes Annotated, section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at St. Anthony, in Fremont County, Idaho, having a general circulation in said county, and that said newspaper has been printed and published as a weekly newspaper in said county for more than 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of .....

Notice of Public Meeting

And affiant further says that said notice, advertisement of publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issue thereof, for 2 consecutive issues thereof; first publication having been made on the 13th day of September 19 84, and the last publication on the 20th day of September 19 84

And affiant further says that at the times herein mentioned said newspaper was made up of at least four pages of at least five columns each, printed from type matter, of at least seventeen and three-fourths inches deep.

Carol Bessey

Subscribed in my presence and sworn to before me this 25th day of September, 19 84

Linda Sheldon

[SEAL] Notary Public for the State of Idaho, residence and post office address: ~~St. Anthony~~ Ashton, Idaho.

RECEIVED
SEP 27 1984
Department of Water Resources
Eastern District Office

NOTICE OF PUBLIC MEETING

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, Sept. 26, 1984, at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

No. 21-7281 proposing the appropriation of 140 cfs of water from Fall River tributary to Henry's Fork Snake River. The location of the reach is the NE¼SE¼, Sec. 14, T. 8N, R. 41E, upstream approximately 8 miles to State Highway 32 in the SE¼NW¼, Sec. 18, T. 8N, R. 43E.

No. 21-7283 proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NW¼, Sec. 13, T. 9N, R. 43E, upstream approximately ½ mile to State Highway 47 in the SW¼SE¼, Sec. 12, T. 9N, R. 43E, B.M. both in Fremont County.

On Thursday, September 27, 1984 at 7:30 p.m. in the Courtroom, Teton County Courthouse, Driggs, Idaho and additional public meeting will be held to receive comments on minimum streamflow applications as follows:

No. 22-7369 proposing the appropriation of 106 cfs from the Teton River, tributary to Henry's Fork Snake River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 9 miles to State Highway 33 in the SE¼SW¼, Sec. 23, T. 6N, R. 44E.

No. 22-7370 proposing the appropriation of 28 cfs from Bitch Creek tributary to Teton River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 6 miles to State Highway 32 in the NW¼NW¼, Sec. 17, T. 7N, R. 45E, B.M., both in Teton County.

All of the above applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

A. KENNETH DUNN
Director

Publ. Sept. 13 and 20, 1984AH

MICROFILMED
JAN 06 1989

AFFIDAVIT OF PUBLICATION

State of Idaho)
) ss
County of Teton)

I, DeAnn Hatch, being first duly sworn depose and say that I am the Secretary of the Teton Valley News, a newspaper as defined by Idaho Codes Annotated, Section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at Driggs, in Teton County, Idaho, having a general circulation in said county, and that said newspaper has been printed in said county for more that 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of

Notice of Public Meeting

And affiant further says that said attached notice, advertisement or publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issure thereof, for 2 consecutive issues thereof; first publication having been made on the 13 day of Sept, 1984 and last publication on the 20 day of Sept, 1984

And affiant further says that at the times herein mentioned said newspaper was made up of at least eight pages of at least five columns each, printed from type matter, of at least sixteen inches deep.

DeAnn Hatch

Subscribed in my presence and sworn to before me this 24th day of Sept, 1984

(SEAL) Notary Public for the state of Idaho, residence and postoffice address, Driggs, Idaho.

Linda Hammer

My Commission expires 9/29, 1988

NOTICE OF PUBLIC MEETING

NOTICE IS HEREBY GIVEN, that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

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All of the above applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

A. Kenneth Dunn, Director.
Published in the Teton Valley News on September 13 and 20, 1984.

RECEIVED
SEP 24 1984
Department of Water Resources
Eastern District Office

MICROFILMED
JAN 06 1989

Proof of Publication

The Post-Register

RECEIVED
SEP 24 1984
Department of Water Resources
Eastern District Office

State of Idaho, }
County of Bonneville } ss.

I, J. Robb Brady, first being duly sworn, depose and say: That I am the Principal Clerk of The Post Company, a corporation of Idaho Falls, Bonneville County, Idaho, publishers of The Post-Register, a newspaper of general circulation, published daily, except Saturday, at Idaho Falls, Idaho; said Post-Register being a consolidation of the Idaho Falls Times, established in the year 1890, The Idaho Register, established in the year 1880 and the Idaho Falls Post, established in 1903, such consolidation being made on the 1st day of November, 1931, and each of said newspapers having been published continuously and uninterruptedly, prior to consolidation, for more than seventy-eighty (78) weeks and said Post-Register having been published continuously and uninterruptedly from the date of such consolidation, up to and including the last publication of notice hereinafter referred to.

That the notice, of which a copy is hereto attached and made a part of this affidavit, was published in said Post-Register for two consecutive weeks, first publication having been made on the 13th day of September, 19 84, last publication having been made on the 20th day of September, 19 84, and that the said notice was published in the regular and entire issue of said paper on the respective dates of publication, and that such notice was published in the newspaper and not in a supplement.

J. Robb Brady

Subscribed and sworn to before me, this 21st day of September, 19 84

Clark Kapsen

Notary Public

My commission expires September 30, 19 84

B10, 1M,

NOTICE OF PUBLIC MEETING

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

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All of the above, applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

A. KENNETH DUNN
Director

Published: September 13, 20, 1984

MICROFILMED
JAN 06 1989

RECEIVED
OCT 25 1985
Department of Water Resources
Eastern District Office

STATE OF IDAHO)
) ss.
COUNTY OF ADA)

Laura Gay Barnes, being duly sworn, deposes and says: That she is the Principal Clerk of The Idaho Statesman, a daily newspaper printed and published at Boise, Ada County, State of Idaho, and having a general circulation therein and which said newspaper has been continuously and uninterruptedly published in said County during a period of twelve consecutive months prior to the first publication of the notice, a copy of which is attached hereto; that said notice was published in The Idaho Statesman in conformity with Section 60-108, Idaho Code as amended, for Two (2) consecutive weekly insertions beginning with the issue of October 17, 19 85, and ending with the issue of October 24, 1985.

Laura Gay Barnes

Subscribed and sworn to before me this 24th day of October, 19 85.

Jeanne M Hawle

Notary Public for Idaho, Residing at Boise, Idaho.

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981, Application No. 21-7283, proposing the appropriation of 141 cfs of water from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E., upstream approximately ½ mile to State Highway 47 in the SWSE, Sec. 12, T. 9N., R. 43E.

On September 27, 1984, Application No. 21-7355, proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork. The location of the reach is the SWSE, Sec. 12, T. 9N., R. 43E., from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Sec. 10, T. 10N., R. 44E., B.M., both in Fremont County.

The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The Director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m., November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of *Section 42-1503, Idaho Code.*

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued, the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Pub. Oct. 17, 24, 1985 9361

MICROFILMED
JAN 06 1989

TRIBUNE PUBLISHING COMPANY, INC.
The Lewiston Morning Tribune
505 C St., P.O. Box 957
Lewiston, Idaho 83501
(208) 743-9411

Date 102485 INVOICE No. L00059634

Account No. 44660

Description 59634LEGAL

LEGAL ADVERTISING
INVOICE

Times 2 Lines 62

Tab Lines

SOLD TO: STATE OF IDAHO
DEPT. OF WATER RESOURCES
150 SHOUP AVE. SUITE 15
TWIN FALLS
ID 83402

$ 54.25

RECEIVED
OCT 28 1985
Department of Water Resources
Eastern District Office

NOTICE:This is an invoice of Purchase made by you. Statement will be rendered the first of the month.
Please Retain This Invoice as Your Statement Will Refer To Invoice by No. Only.

59634

LEGAL NOTICE

Notice has been given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW.

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications to rpermits to the Department of Water Resources:

On June 19, 1985, application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately ½ mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

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The applications werre filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to th provision of Section 42-1503, Idaho Code.

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross-examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

MICROFILMED
JAN 06 1989

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO, ss.
County of Nez Perce

S. L. Stone, being duly sworn, deposes and says, I am the Legal Clerk of the Tribune Publishing Company, a corporation organized and existing under and by virtue of the laws of the State of Idaho, publishers of the LEWISTON MORNING TRIBUNE, a newspaper of general circulation published at Lewiston, Nez Perce County, Idaho; That the said Lewiston Morning Tribune is an established paper and has been published regularly and issued regularly at least once a day for more than 21 consecutive years next immediately preceding the first publication of this notice, and has been so published uninterrupted for said period; that the

LEGAL NOTICE Notice has been given

attached hereto and which is made a part of this affidavit was published in the said Lewiston Morning Tribune, 2 time(s). Publication being on 101785, or once a week for two consecutive weeks, the first publication thereof being on the 101785, and the last publication thereof being on the 102485, and said LEGAL NOTICE Notice has been given was so published in the regular and entire issue of said newspaper and not in a supplement thereof and was so published in every issue and number of the said paper, during the period and times of publication as set forth above.

S. L. Stone

SUBSCRIBED AND SWORN BEFORE ME THIS THE 25 day of October 1985

Sheral M. Lantz

Notary Public in and for the State of Idaho, residing at Lewiston, therein.

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981 application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

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The applications were filed to protect the quality of the fisheries habitat within

Affidavit of Publication

STATE OF IDAHO, }
COUNTY OF TWIN FALLS } ss.

No 15581

I, Linda Copps McGuire being first duly sworn upon oath, depose and say that I am Press Clerk of the TIMES-NEWS, published daily, at Twin Falls, Idaho, and do solemnly swear that a copy of the notice of advertisement, as per clipping attached, was published in the regular and entire issue of said newspaper, and not in any supplement thereof, for Two consecutive weeks, commencing with the issue dated October 17, 1985, and ending with the issue dated October 24, 1985.

And I do further certify that said newspaper is a consolidation, effective February 16, 1942, of the Idaho Evening Times, published theretofore daily except Sunday, and the Twin Falls News, published theretofore daily except Monday, both of which newspapers prior to consolidation had been published under said names in said city and county continuously and uninterruptedly during a period of more than twelve consecutive months, and said TIMES-NEWS, since such consolidation, has been published as a daily newspaper except Saturday, until July 31, 1978, at which time said newspaper began daily publication under said name in said city and county continuously and uninterruptedly.

And I further certify that pursuant to Section 60-108 Idaho Code, Thursday of each week has been designated as the day on which legal notice by law or by order of any court of competent jurisdiction within the state of Idaho, to be published weekly, will be published; and that at the head of the editorial column of said combined newspapers, and in each issue thereof, Thursday is announced as the day on which said legal notices will be published.

JAN 06 1989

Linda Copps McGuire

Subscribed and sworn to before me on this 24 day of October, 1985

Donna Bruce

Notary Public in and for the County of Twin Falls, State of Idaho, residing at Twin Falls, Idaho

Proof of Publication

The Post-Register

RECEIVED
OCT 28 1985
Department of Water Resources
Eastern District Office

State of Idaho,
County of Bonneville } ss.

I, J. Robb Brady, first being duly sworn, depose and say: That I am the Principal Clerk of The Post Company, a corporation of Idaho Falls, Bonneville County, Idaho, publishers of The Post-Register, a newspaper of general circulation, published daily, except Saturday, at Idaho Falls, Idaho; said Post-Register being a consolidation of the Idaho Falls Times, established in the year 1890, The Idaho Register, established in the year 1880 and the Idaho Falls Post, established in 1903, such consolidation being made on the 1st day of November, 1931, and each of said newspapers having been published continuously and uninterruptedly, prior to consolidation, for more than seventy-eighty (78) weeks and said Post-Register having been published continuously and uninterruptedly from the date of such consolidation, up to and including the last publication of notice hereinafter referred to.

That the notice, of which a copy is hereto attached and made a part of this affidavit, was published in said Post-Register for two consecutive weeks, first publication having been made on the 17th day of October, 19 85, last publication having been made on the 24th day of October, 19 85, and that the said notice was published in the regular and entire issue of said paper on the respective dates of publication, and that such notice was published in the newspaper and not in a supplement.

J. Robb Brady

Subscribed and sworn to before me, this 24th day of October, 19 85

Notary Public

My commission expires September 30, 19 88

B10, 1M,

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION
FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981 application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

On September 27, 1984, application No. 21-7355 proposing the appropriation of 141 cfs from Warm River tributary to Henrys Fork. The location of the reach is the SWSE, Sec. 12, T. 9N, R. 43E, from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Sec. 10, T. 10N, R. 44E, B.M., both in Fremont County.

The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The Director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of Section 42-1503, Idaho Code.

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Published: October 17, 24, 1985

MICROFILMED
JAN 06 1989

AFFIDAVIT OF PUBLICATION

State of Idaho } ss.
County of Fremont }

Helen D. Hunter

being first duly sworn, upon ~~his~~ her oath, deposes and says:

That she is the Business Clerk of The Ashton Herald, a newspaper as defined by Idaho Codes Annotated, section 58-106, as amended, and that said newspaper is a weekly newspaper printed and published at St. Anthony, in Fremont County, Idaho, having a general circulation in said county, and that said newspaper has been printed and published as a weekly newspaper in said county for more than 78 consecutive weeks prior to the first publication of the attached notice, advertisement or publication of .....

notice of public hearing
Fremont County

And affiant further says that said notice, advertisement of publication, as per clipping attached, was published in said newspaper, in the regular and entire issue thereof, and not in any supplement issue thereof, for ....2..... consecutive issues thereof; first publication having been made on the ..17..... day of ..October....., 19~~85~~, and the last publication on the 24th day of October 19~~85~~.

And affiant further says that at the times herein mentioned said newspaper was made up of at least four pages of at least five columns each, printed from type matter, of at least seventeen and three-fourths inches deep.

Helen D. Hunter

Subscribed in my presence and sworn to before me this 29th day of October, 19~~85~~.

James E. Holcomb

[SEAL]

Notary Public for the State of Idaho, residence and post office address: ~~St. Anthony~~, Idaho. Ashton

RECEIVED
OCT 30 1985
Department of Water Resources
Eastern District Office

LEGAL NOTICE

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Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issured the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Publ. Oct. 17 and 24, 1985AH

MICROFILMED
JAN 06 1989

RECEIVED
NOV 7 1985
Department of Water Resources
Eastern District Office

THE CHRONICLE-NEWS
ST. ANTHONY, IDAHO

AFFIDAVIT OF PUBLICATION

STATE OF IDAHO } ss
County of Fremont }

I, Terry Weatherston,
being first duly sworn, depose and say, that I am the printer of THE CHRONICLE-NEWS, a weekly newspaper printed and published weekly at St. Anthony, Fremont County, Idaho; and I do solemnly swear that the

Legal Notice

a copy of which notice appears attached hereto, was published in the regular and entire issue of said newspaper, and not in any supplement issue thereof for 2 consecutive issues, the first publication having been made on Oct. 17, 1985 and the last publication having been made on Oct. 24, 1985.

Further, that said newspaper is one of general circulation in said county; that it is a legal newspaper, conforming to legal specifications under the Idaho Statutes; that it has at least two hundred bona fide subscribers living within the county of publication; and that it has been continuously and uninteruptedly published in said county during a period of seventy-eight consecutive weeks prior to the first publication of the said notice.

Terry Weatherston

Subscribed to and sworn to before me this Oct. 25, 1985

Geri Garner
Notary Public.

(SEAL)

My commission expires life

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

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If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

Publ. Oct. 17 and 24, 1985CN.

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720-9000
Phone: (208) 327-7900 FAX: (208) 327-7866

PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

August 25, 1995

STATE OF IDAHO
IDAHO WATER RESOURCE BOARD
STATEHOUSE
BOISE ID 83720

RE: WATER RIGHT NO. 21-07283

Dear Water Right Holder(s):

Enclosed is a copy of the Water Right License issued on the above referenced permit. If you have any questions, please contact me within 10 days of receipt of this license.

Sincerely,

Shelley W. Keen
Water Rights Supervisor

SK:rl

Enclosure

RECEIVED
SEP 14 1995

LICENSING REVIEW
MINIMUM STREAM FLOW

RIGHT NO. 21-07283

Proof of beneficial use rec'd 2/22/94

Was flow data submittal a requirement with proof submittal? Yes ____ No ✓

If yes, has data been reviewed and a determination made that minimum flow is capable of being maintained? Yes ____ No ____ N/A

Data submitted fully complies with permit condition (i.e. # of years of flow data sufficient) N/A

Data Entry for License:

- Name Standardized ✓
- Total cfs & div. capacity listed as highest flow ✓
- P/D(s) beginning and ending descriptions listed ✓
- Use flows defined for entire year ✓
- P/U left blank (description in remarks) ✓
- Remarks/non-standard conditions
  - Non-consumptive ✓
  - Watermaster control N/A
  - Jurisdiction retains to amend ✓
  - Description of reach(es) ✓
  - All other applicable permit conditions carried forward ✓

Comments/adjustments _____

Printed license hand-edited _____

March 1, 1994

STATE OF IDAHO
IDAHO WATER RESOURCE BOARD
STATEHOUSE
BOISE ID 83720

PROOF ACKNOWLEDGMENT LETTER

RE: PERMIT NO. 21-07283

Dear Permit Holder:

The department acknowledges receipt of the proof of beneficial use form submitted for the above referenced permit. The next step in the process of developing a water right is for the department to conduct a field examination to determine and confirm the use being made of the water.

If you have questions concerning this matter, please feel free to contact the EASTERN Regional Office in Idaho Falls at (208)525-7161.

Sincerely,

JULIE L. YARBROUGH
Senior Secretary

c: IDWR - Region

APR 07 1994

ANALYSIS SHEET
FOR
PROOF OF BENEFICIAL USE

Permit No. 21-07283 Reviewed by [signature] Date 3-1-94

GENERAL CONSIDERATIONS

yes Name same as permit?
yes Address same as permit?
yes Proof timely received?
If not, complete calculation below.

TYPES OF USE

minimum Stream Flow

Correct Uses? yes

SOURCE OF WATER

X Surface water source
____ Ground water source
____ Drilling permit required?
____ Copy in the file? Drilling Permit No. ____
____ Amount paid for permit ____ Correct?
____ Well log in the file?

LICENSE EXAMINATION FEE

no Required?
____ Amount Submitted
____ Correct?

MEASURING DEVICE

no Required?
____ Installed?
____ Waiver requested?

PRIORITY CALCULATION

Date proof received			
Date proof due		−	
No. of days late		=	
Priority Date		+	
New Priority Date			

DEFICIENCIES OR ACTION ITEMS

Proof acceptable

DATA ENTRY _____
New Address _____ Proof Made 2-22-94

January 31, 1994

STATE OF IDAHO
IDAHO WATER RESOURCE BOARD
STATEHOUSE
BOISE ID 83720

PROOF DUE NOTICE

RE: PERMIT NO. 21-07283

Dear Permit Holder:

One of the conditions of approval of the above referenced water permit was that proof of the extent of your beneficial use must be submitted to this office on or before April 1, 1994. (See last page of your approved permit or your last approved extension request.) Enclosed is a form which when accompanied by the license examination fee or a complete field examination report prepared by a certified water right examiner may be used to submit the required proof.

If you have not fully completed your project, and you or a previous owner of this permit have not received a prior extension of time, you may request an extension of time if the delay is for reasonable cause as provided in Section 42-204, Idaho Code. If you have been prevented from proceeding by a governmental agency or by litigation which might bring title to the water in question, more than one extension of time can be granted. An extension of time request form is enclosed for your convenience.

Either an acceptable proof of beneficial use submittal or an acceptable request for an extension of time must be received by this department on or before the above described proof due date. If neither is received, the department will send you a lapse notice. Within sixty (60) days of the mailing of the lapse notice, the permit will no longer be of any force nor effect.

SINCERELY,

JULIE L. YARBROUGH
Senior Secretary

Enclosures

RECEIVED
APR 07 1994

Hand carry

CERTIFIED MAIL
NO.

A CONCURRENT RESOLUTION

APPROVING AN APPLICATION TO APPROPRIATE WATER

FOR MINIMUM STREAMFLOW

21-7283

Be It Resolved by the Legislature of the State of Idaho:

WHEREAS, the Idaho Water Resource Board may apply for a permit to appropriate unappropriated waters of any stream to establish a minimum streamflow; and

WHEREAS, under the provisions of Section 42-1503, Idaho Code, an approved application shall not become finally effective until acted upon by the legislature, except that if the legislature fails to act prior to the end of the regular session to which the application was submitted, the application shall be considered approved; and

WHEREAS, the Director of the Department of Water Resources approved Application for Permit No. 21-7283 on December 23, 1988, by adopting a Proposed Memorandum Decision and Order authorizing the appropriation of a minimum streamflow in Warm River of 141 cfs during the period beginning January 1 through December 31. The minimum streamflow begins in the NW1/4NW1/4, Sec. 13, T9N, R43E, B.M., Fremont County, at the confluence of Warm River and Henrys Fork, and extends upstream approximately one-half mile to the intersection of State Highway 47 with Warm River, located in the SW1/4SE1/4, Sec. 12, T9N, R43E, B.M., Fremont County;

NOW, THEREFORE, BE IT RESOLVED by the members of the Second Regular Session of the Forty Ninth Idaho Legislature, the Senate and the House of Representatives concurring therein, that the same is hereby approved subject to the conditions and limitations contained in the Proposed Memorandum Decision and Order, dated November 28, 1988, adopted by the Director of the Department of Water Resources.

MICROFILMED
MAY 15 1989

THE STATE OF IDAHO

CENTENNIAL LEGISLATURE — FIRST REGULAR SESSION — 1989

IN THE SENATE

SENATE CONCURRENT RESOLUTION NO. 105

BY RESOURCES AND ENVIRONMENT COMMITTEE

A CONCURRENT RESOLUTION
APPROVING AN APPLICATION TO APPROPRIATE WATER FOR MINIMUM STREAMFLOW.

Be It Resolved by the Legislature of the State of Idaho:

WHEREAS, the Idaho Water Resource Board may apply for a permit to appropriate unappropriated waters of any stream to establish a minimum streamflow; and

WHEREAS, under the provisions of Section 42-1503, Idaho Code, an approved application shall not become finally effective until acted upon by the legislature, except that if the legislature fails to act prior to the end of the regular session to which the application was submitted, the application shall be considered approved; and

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NOW, THEREFORE, BE IT RESOLVED by the members of the First Regular Session of the Centennial Idaho Legislature, the Senate and the House of Representatives concurring therein, that the same is hereby approved subject to the conditions and limitations contained in the Proposed Memorandum Decision and Order, dated November 28, 1988, adopted by the Director of the Department of Water Resources.

MICROFILMED

MAY 15 1989

SUMMARY OF HEARING FOR WARM RIVER
MINIMUM STREAMFLOW
WATER RIGHT NOS. 21-7355 & 21-7283
FEBRUARY 28, 1989

BY: Gary Spackman

A public information meeting was conducted on September 26, 1984. Nine letters were received by the Board, and they were all favorable for the minimum streamflow. In response to public support, the Board decided to file an additional application to include the upper eight miles of the river.

The hearing was originally scheduled for November of 1984, but was delayed because of Swan Falls related matters being heard by the Board.

Part of the hearing, a letter in favor of the proposal was received from Bruce Staples and a letter opposing the minimum streamflow was received by Ted Sorenson.

At the hearing, the Board expressly requested that the minimum streamflow be subordinated to a future dam site on Warm River identified in the Idaho State Water Plan. The Board also stated that the minimum streamflow would not interfere with vested water rights.

Fish & Game estimates on Warm River angler use is approximately 4000 angler days per year. Warm River is an important spawning tributary of the Henrys Fork.

Leigh Chantrill opposed the minimum streamflow because of possible closure to development. He stated that the percent of people in the local area using electricity was much higher than the percent of people using the fishery. He also stated that, in his opinion, the water users in the area were against the minimum streamflow.

His position was that we should not do anything until someone else proposes something. He stated that he was speaking for the Idaho water users, and also stated that nothing could be done with the water except develop it for hydropower purposes. He stated that the local people should say how the water should be controlled.

RECEIVED
MAY 15 1989
WATER

Ted Sorenson, representing the Independent Power Producer Council of the State of Idaho, stated that sufficient studies had not been conducted in the upper reach to justify the minimum streamflow. He felt that the minimum streamflow would foreclose options in the future for hydropower development. He also stated

that, in the federal review of a proposed hydropower plant, that the Federal Energy Regulatory Commission requires detailed coordination with environmental agencies, and regularly establishes a minimum streamflow. He also stated that, in his opinion, the full social and economic values of the hydropower possibilities versus recreation possibilities had not been explored.

Brian Christenson, an employee of the U.S. Forest Service, stated that the upper reach was within the National Forest, and that it had unique value. He estimated angular days of 5000 angular per year. He also stated that at Pole Bridge Campground, there were 9000 visitor days per year, and at the Warm River Campground, there were 37,500 visitor days per year. These numbers were estimated by sampling counts at the campgrounds.

Mark Loosen, an outfitter and tackle business proprietor, stated that there are a lot of fish in both the upper and lower portions of Warm River, including the Cascade area. He stated that he employs thirteen guides during the summer months, and that much of the fishing occurs on Warm River. He strongly supported the minimum streamflow.

Dale Swenson of the Freemont Madison Irrigation District testified that the district was opposed to the minimum streamflow on Warm River, and that he supported Ted Sorenson's position. He stated that there was no need for minimum streamflows, and that he was opposed to the whole concept.

He also stated that there was no irrigable land within the minimum streamflow reach. A statement was made regarding possible reduction in pumping costs which could be defrayed if a hydropower facility was built.

Ronald Heck, a guide that lives in Island Park, stated that Warm River was an excellent fishery, and that it was an important resource to the area.

Harold Roberts of Trout Unlimited, stated that Trout Unlimited supported the minimum streamflow.

MICROFILMED

MAY [illegible], 1989

WARM RIVER
MINIMUM STREAMFLOW
Fact Sheet

Water Right No.: 21-7283

Source: Warm River tributary to Henry's Fork

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish & Game

Date Application Filed: June 19, 1981

Rate of Flow: 141 cubic feet per second

Location of Reach: NW1/4NW1/4 Sec. 12, T9N, R43E, Fremont County, upstream about 1/2 mile to State Highway 47 in the SW1/4SE1/4 Sec. 18, T9N, R43E, B.M., Fremont County.

Purpose: To maintain high quality fisheries and spawning and rearing habitat.

Hearing: November 20, 1985, in St. Anthony, Idaho

Attended by 29 people

Leigh Chantrill opposed the application because it might prevent the water from being used for some future beneficial use.

Permit: Order Adopting Proposed Decision dated December 23, 1988

Special Conditions: Subordinate to reservoir site reserved in the state water plan.

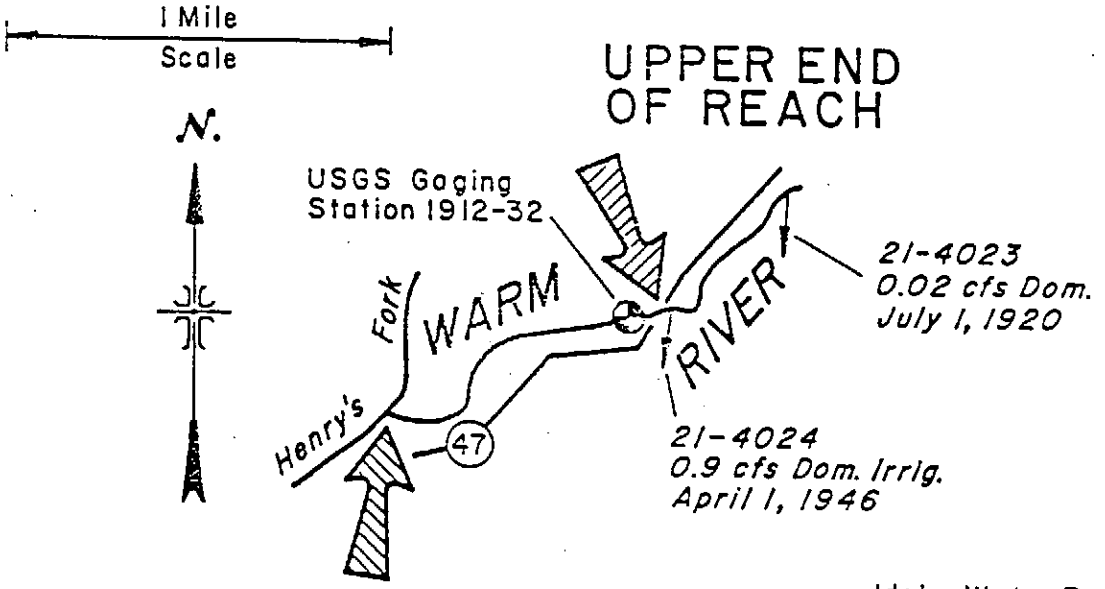
Retained jurisdiction for change. Proposed amendment must be submitted initially to the Board.

General Information: No conflicting hydropower filing

MICROFILMED
MAY 15 1989

MICROFILMED
JAN 06 1989
IDWR STAFF
EXHIBIT #2

Minimum Stream Flow No. 21-7283
Warm River



Idaho Water Resource
Board Filing: 141 cfs;
June 19, 1981.

MICROFILMED
MAY 15 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVERNOR
R. KEITH HIGGINSON
DIRECTOR

January 9, 1989

Representative Tom Boyd, Speaker
House of Representatives
Statehouse
Boise, ID 83720

RE: Water Right Applications for Permit for Minimum Streamflow

RE: Water Right Applications for Permit for Minimum Streamflow Nos.: 36-8374 and 36-8330, Crystal Springs; 22-7370, Bitch Creek; 37-7920, Malad River; 36-8337, Box Canyon Creek; 21-7283 and 21-7355, Warm River; 47-8073, Shoshone Creek; 97-7275, Lion Creek; and 97-7274, Indian Creek; 36-7820, Blind Canyon Springs.

Dear Representative Boyd:

Enclosed please find copies of the above referenced Applications for Permit. Enclosed with the applications are the decisions and orders which conclude the administrative processing of the applications.

As you are aware, Section 42-1503, Idaho Code, requires that the applications be reviewed by the legislature. As defined by statute, each application "(i) shall not become finally effective until affirmatively acted upon by concurrent resolution of the Idaho Legislature; or (ii) except that if the legislature fails to act prior to the end of the regular session to which the application was submitted, the application shall be considered approved."

This letter constitutes submittal of the applications to the legislature for approval. Please advise me if you desire further information or presentation on the nature of the applications. Department personnel are also willing to assist with preparation of draft concurrent resolutions if requested.

Sincerely,

R. KEITH HIGGINSON
Director

GS:ds
Enclosures

CC: Legislative Council

MICROFILMED
MAY 15 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVERNOR
R. KEITH HIGGINSON
DIRECTOR

January 9, 1989

Senator Michael Crapo, President
Senate pro Tem
Statehouse
Boise, ID 83720

RE: Water Right Applications for Permit for Minimum Streamflow Nos.: 36-8374 and 36-8330, Crystal Springs; 22-7370, Bitch Creek; 37-7920, Malad River; 36-8337, Box Canyon Creek; 21-7283 and 21-7355, Warm River; 47-8073, Shoshone Creek; 97-7275, Lion Creek; and 97-7274, Indian Creek; 36-7820, Blind Canyon Springs.

Dear Senator Crapo:

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Sincerely,

R. KEITH HIGGINSON
Director

GS:ds
Enclosures

CC: Legislative Council

MICROFILMED
MAY 15 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

December 23, 1988

Dave Rydalch
Rt. 2 Box 108
St. Anthony, ID 83445

Re: Application for Permit No. 21-7283 and 21-7355

Dear Mr. Rydalch:

Please find a copy of the Order Adopting Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355 (Warm River) to establish a minimum stream flow in the name of the Idaho Water Resource Board.

Any party who disagrees with the decision of the Director may request a rehearing before the Director within 20 days or may appeal to the district court within 30 days from the date this decision is mailed.

Sincerely,

Gary Spackman

GARY SPACKMAN, Manager
Water Rights Permits Section

GS:ds

Enclosure

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

December 23, 1988

Ted Sorenson
550 Linden
Idaho Falls, ID 83401

Re: Application for Permit No. 21-7283 and 21-7355

Dear Mr. Sorenson:

Please find a copy of the Order Adopting Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355 (Warm River) to establish a minimum stream flow in the name of the Idaho Water Resource Board.

Any party who disagrees with the decision of the Director may request a rehearing before the Director within 20 days or may appeal to the district court within 30 days from the date this decision is mailed.

Sincerely,

Gary Spackman

GARY SPACKMAN, Manager
Water Rights Permits Section

GS:ds

Enclosure

UFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

December 23, 1988

Gene Gray
2393 Watts Lane
Payette, ID 83661

Re: Application for Permit No. 21-7283 and 21-7355

Dear Mr. Gray:

Please find a copy of the Order Adopting Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355 (Warm River) to establish a minimum stream flow in the name of the Idaho Water Resource Board.

Any party who disagrees with the decision of the Director may request a rehearing before the Director within 20 days or may appeal to the district court within 30 days from the date this decision is mailed.

Sincerely,

Gary Spackman

GARY SPACKMAN, Manager
Water Rights Permits Section

GS:ds

Enclosure

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

December 23, 1988

Idaho Dept. of Fish & Game
c/o Steve Goddard
Box 25
Boise, ID 83720

Re: Application for Permit No. 21-7283 and 21-7355

Dear Mr. Goddard:

Please find a copy of the Order Adopting Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355 (Warm River) to establish a minimum stream flow in the name of the Idaho Water Resource Board.

Any party who disagrees with the decision of the Director may request a rehearing before the Director within 20 days or may appeal to the district court within 30 days from the date this decision is mailed.

Sincerely,

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GARY SPACKMAN, Manager
Water Rights Permits Section

GS:ds

Enclosure

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

December 23, 1988

Leigh Chantrill
Newdale, ID 83436

Re: Application for Permit No. 21-7283 and 21-7355

Dear Mr.Chantrill:

Please find a copy of the Order Adopting Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355 (Warm River) to establish a minimum stream flow in the name of the Idaho Water Resource Board.

Any party who disagrees with the decision of the Director may request a rehearing before the Director within 20 days or may appeal to the district court within 30 days from the date this decision is mailed.

Sincerely,

Gary Spackman

GARY SPACKMAN, Manager
Water Rights Permits Section

GS:ds

Enclosure

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

November 28, 1988

Leigh Chantrill
Newdale, ID 83436

Re: Application for Permit Nos. 21-7283 and 21-7355

Dear Mr. Chantrill:

Please find enclosed a copy of the Proposed Memorandum Decision and Order and Order Issuing Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355. The application, filed by the Idaho Water Resource Board, proposes a minimum streamflow on Warm River.

Any party who disagrees with the proposed decision may file exceptions to the decision within fifteen (15) days of service of the proposed decision.

Sincerely,

Gary Spackman

GARY SPACKMAN, Supervisor
Water Allocation Section

GS:ds

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

November 28, 1988

Idaho Fish & Game
Steve Goddard
Box 25
Boise, ID 83720

Re: Application for Permit Nos. 21-7283 and 21-7355

Dear Mr. Goddard:

Please find enclosed a copy of the Proposed Memorandum Decision and Order and Order Issuing Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355. The application, filed by the Idaho Water Resource Board, proposes a minimum streamflow on Warm River.

Any party who disagrees with the proposed decision may file exceptions to the decision within fifteen (15) days of service of the proposed decision.

Sincerely,

Gary Spackman

GARY SPACKMAN, Supervisor
Water Allocation Section

GS:ds

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JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

November 28, 1988

Idaho Water Resource Board
c/o Gene Gray
Statehouse
Boise, ID 83720

Re: Application for Permit Nos. 21-7283 and 21-7355

Dear Mr. Gray:

Please find enclosed a copy of the Proposed Memorandum Decision and Order and Order Issuing Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355. The application, filed by the Idaho Water Resource Board, proposes a minimum streamflow on Warm River.

Any party who disagrees with the proposed decision may file exceptions to the decision within fifteen (15) days of service of the proposed decision.

Sincerely,

Gary Spackman

GARY SPACKMAN, Supervisor
Water Allocation Section

GS:ds

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JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

November 28, 1988

Dave Rydalch
Rt. 2, Box 108
St. Anthony, ID 83445

Re: Application for Permit Nos. 21-7283 and 21-7355

Dear Mr. Rydalch:

Please find enclosed a copy of the Proposed Memorandum Decision and Order and Order Issuing Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355. The application, filed by the Idaho Water Resource Board, proposes a minimum streamflow on Warm River.

Any party who disagrees with the proposed decision may file exceptions to the decision within fifteen (15) days of service of the proposed decision.

Sincerely,

Gary Spackman

GARY SPACKMAN, Supervisor
Water Allocation Section

GS:ds

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JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720 - (208) 334-7900

CECIL D. ANDRUS
GOVENOR
R. KEITH HIGGINSON
DIRECTOR

November 28, 1988

Ted Sorenson
550 Linden
Idaho Falls, Id 83401

Re: Application for Permit Nos. 21-7283 and 21-7355

Dear Mr. Sorenson:

Please find enclosed a copy of the Proposed Memorandum Decision and Order and Order Issuing Proposed Memorandum Decision and Order for Application Nos. 21-7283 and 21-7355. The application, filed by the Idaho Water Resource Board, proposes a minimum streamflow on Warm River.

Any party who disagrees with the proposed decision may file exceptions to the decision within fifteen (15) days of service of the proposed decision.

Sincerely,

Gary Spackman

GARY SPACKMAN, Supervisor
Water Allocation Section

GS:ds

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JAN 06 1989

November 13, 1985

Fremont County Clerk
Fremont County Courthouse
St. Anthony, ID 83445

Gentlemen:

This is to confirm the use of the Courtroom for water right hearings to be held by this Department on November 20, 1985 beginning at 9:30 a.m.

Thank you for your cooperation in this matter.

Very truly yours,

COLLEEN WRAY
Adm. Secretary

FILMED
JAN 06 1989

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
EASTERN REGION

John V. Evans
Governor

A. Kenneth Dunn
Director

150 Shoup — Suite 15
Idaho Falls, Idaho 83402
(208) 525-7161

November 4, 1985

Fremont County Chronicle News
P.O. Box 568
St. Anthony, ID 83445

RE: Notice of Application for Permits No. 22-7369, 22-7370 & 21-7283 IDAHO WATER RESOURCE BOARD.

Gentlemen:

Would you please submit an affidavit of publication and certified bill in connection with the above referenced Applications. The legal notice was to have been published in your paper on October 17, and 24, 1985.

Your cooperation in this matter is greatly appreciated.

Very truly yours,

MICHELE DAVIS
Office Secretary

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JAN 06 1989

MINIMUM STREAMFLOW REQUEST/APPLICATION

PROCESSING CHECKLIST

	ASSIGNED TO	INITIALS/DATE
1. Request received and checklist attached.	Receptionist	RG
2. Request indexed.	Records Chief	RG
3. Preliminary review. Application prepared for signature.	Section Supv.	LGS
4. Streamflow information requested from hydrology.	Section Supv.	DRT / 8/8/84
5. Region advised of request.	Section Supv.	6/81
6. Acknowledgment letter sent.	Section Supv.	VERBAL
7. Copy of request routed to: Reg. Off. Bur. Chief; Oper. Bur. Chief; Admin.; Director.	Records Chief	RG
8. Copy of request routed to Administrator, Resources Analysis Division for placement on Board Agenda.	Records Chief	RG
9. Water Rights researched & abstracted.	Records Chief	RG 8/17/84
10. Visual aid request prepared.	Section Supv.	
11. Visual aid reviewed.	Section Supv.	
12. Request and related data presented to Board.	Administrator, Res. Admin. Div.	LGS
13. Filed or Rejected by Board.	Sec. Supv. et.al.	LGS
14. Board action indexed.	Records Chief	RG
15. Original application sent to region.	Records Chief	RG
16. Copy of application sent to F&G, H&W, Parks & Recreation (mandatory)	Region	Requested Region to do so on 8/29 DRT / KW 7/10/8
17. Notice sent to each water right holder or applicant on MSF reach.	Sec. Supv.	—
18. Application advertised w/o hearing date.	Region	✓
19. Personal contact made with riparian land owners.	Requestor	NA
20. Need for informal public meeting determined. If yes, proceed with step 21. If no, skip to step 24.	Both Administrators & IWRB	Yes DRT
21. Informal public meeting advertised in legal notices.	Region	Requested Region to do so DRT
22. Notification of informal public meeting sent to:		
a. IWRB members	Section Supv.	DRT
b. Local Legislators	Section Supv.	DRT 9/14/84
c. Watermaster	Section Supv.	DRT
d. Department Personnel	Section Supv.	DRT

e. Local TV & Radio Stations	Section Supv.	KW 9/14
f. Water Right Holders	Requestor	Drft
g. Riparian Owners	Requestor	Drft
23. Information provided to IWRB for decision to proceed, modify, or abondon.	Section Supv.	Drft 10/84
24. Notice of formal hearing advertised in legal notices.	Region	10/85
25. Notification of formal hearing sent to:		
a. IWRB members	Section Supv.	Drft 10/85
b. Local Legislators	Section Supv.	Drft 11/85
c. Watermaster	Section Supv.	Drft 10/85
d. Department Personnel	Section Supv.	Drft 10/85
e. Local TV & Radio Stations	Section Supv.	KW 10/85
f. Water right holders	Section Supv.	Drft 10/85
g. Attendees of informal public meetings.	Section Supv.	Drft 10/85
h. Riparian Owners	Requestor	Drft 10/85
26. Hearing held (mandatory).	Hearing Officer & Regional Rep.	
27. Standard approval procedure for memorandum decision.	Hearing Officer	
28. If application is approved, Legislative approval procedure attached.	Records Chief	

Form No. 202a
3/79

State of Idaho

Department of Water Resources

APPLICATION FOR PERMIT ANALYSIS SHEET

21 7283

INITIAL REVIEW BY: _____ APPLICATION NUMBER: 21-7283

CHECK:

- ☐ Source.
- ☐ Point of diversion.
- ☐ County.
- ☐ Quantity of water and period of use.
- ☐ Description of diverting works.
- ☐ Time required for beneficial use of water.
- ☐ Place of use or acres irrigated.
- ☐ Map.
- ☐ Signature.
- ☐ Fee.

Field check by: _____
Date: _____
Comments: _____

- ☐ Yes ☐ No Field check required.
- ☐ Yes ☐ No Critical groundwater area.
- ☐ Yes ☐ No Request dam safety information. Sent by: _____ Date: _____
- ☐ Yes ☐ No* In form to receipt.

*REQUEST THE FOLLOWING ADDITIONAL INFORMATION FROM THE APPLICANT: _____

SEND COPIES TO:

☑ Idaho State Health Department.	Copies sent by: KW	Date: 7-10
☑ Idaho Fish and Game Department.	KW	7-10
☐ Idaho Department of Lands.		
☐ U.S. Bureau of Land Management.		
☐ U.S. Forest Service.		
☑ Other Parks & Rec.	KW	7-10

PROCESSING:

- ☐ Yes ☐ No Platted by: _____ Map No. _____
- ☐ Yes ☐ No Other rights on same place of use. _____
- ☐ Yes ☐ No* In form for advertising. 8/31 11-04-85
  Final date for protests:
- ☐ Yes ☐ No Protests received. If yes, record information on 4th page of application.

FINAL REGIONAL PROCESSING REVIEW:

- ☑ Affidavit of publication received. Date: 9-3-81 11-12-85
- ☑ Application published correctly. If not, record action taken: _____
- ☐ Fee amount, receipt date & number, recorded on application.
- ☐ Publication dates and paper, recorded on application.
- ☐ Protests, dates, withdrawal, etc., recorded on application.
- ☐ Recommendation & initial, recorded on application.
- ☐ Yes ☐ No Measuring device required.
- ☐ Yes ☐ No Access port required.
- ☐ Yes ☐ No Will water be delivered by watermaster? If yes, what district? _____
  _____ Date of priority recommended.

Special conditions of approval or cover letter. _____

By: _____ Date: _____

STATE OFFICE REVIEW:

☐ See attached sheet for more information.

By: _____ Date: _____

JIM JONES
Attorney General
State of Idaho
Statehouse, Room 210
Boise, Idaho 83720
Telephone: (208) 334-2400

CLIVE J. STRONG
Deputy Attorney General
Chief, Natural Resources Division

PHILLIP J. RASSIER
KENNETH R. ARMENT
Deputy Attorneys General
Idaho Department of Water Resources
450 West State Street
Boise, Idaho 83720
Telephone: (208) 334-4448

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

In The Matter of Application for Preliminary Permit by Great Western Power and Light, Inc.	Project No. 9445-000 MOTION TO INTERVENE OF IDAHO DEPARTMENT OF WATER RESOURCES AND IDAHO WATER RESOURCE BOARD

TO: Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission

The Idaho Department of Water Resources and Idaho Water Resource Board, by and through its undersigned counsel, Kenneth R. Arment, Deputy Attorney General, respectfully move the Federal Energy Regulatory Commission for an order permitting the Department and Board to intervene as parties for all purposes in the above referenced project proceeding pursuant to Rule 214, 18 C.F.R. § 385.214.

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JAN 06 1989

Statement of Department's and Board's Interest and Grounds for Intervention

I.

The Idaho Department of Water Resources (Department) is a duly established executive department of the State of Idaho. Idaho Code § 42-1701 (1977); I.C. § 67-2402 (1980). The names and addresses of persons designated for service of documents in connection with this motion and all further proceedings are as follows:

Kenneth R. Arment
Deputy Attorney General
Idaho Department of Water Resources
450 West State Street
Boise, Idaho 83720

II.

The Department is that agency in state government designated to supervise the appropriation of the waters of the state and allotment of waters to those persons diverting the same for beneficial purposes. I.C. §§ 42-101, 42-1701, 42-1805 (1977 and Supp. 1985). The Director of the Department is authorized to represent the state in all matters pertaining to the appropriation of water in the State of Idaho. I.C. §§ 42-1701, 42-1805 (1977 and Supp. 1985).

III.

The Idaho Water Resource Board (Board) is the constitutionally established water resource agency within the department of water resources for the State of Idaho. I.C. §§ 42-1732, 42-1734 (1977).

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JAN 06 1989

IV.

The Board is that agency in state government designated to formulate an integrated, coordinated program for conservation, development and use of all unappropriated water resources of Idaho, based upon studies and public hearings in affected areas. I.C. § 42-1734 (1977). The Board is also the agency responsible for applications to appropriate minimum stream flows of the unappropriated waters of Idaho. I.C. §§ 42-1503, 42-1504 (Supp. 1985).

V.

Great Western Power and Light, Inc. (Applicant), filed a notice of application for a preliminary permit with the Commission for Warm River Associates, Project No. 9445-000 (Project) on Warm River in the Targhee National Forest, Fremont County, Idaho, on October 25, 1985.

VI.

Pursuant to a request from the Idaho Department of Fish and Game, the Board submitted an application dated September 27, 1984, for a minimum stream flow of 141 cfs for a reach of Warm River from SW1/4SE1/4, Sec. 12, T. 9N, R. 43E, upstream to NW1/4SW1/4, Sec. 10, T. 10N, R. 44E, both B.M., Fremont County, to the Director of the Department in accordance with I.C. §§ 42-1501 through 42-1505 (Supp. 1985). Public meetings and a hearing on the application have been heard, and the Department is engaged in an investigation in accordance with I.C. § 42-1503. The appli-

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JAN 06 1989

cation awaits approval by the Director and the Idaho Legislature, the priority date of the application is protected during the interim. The proposed project site is in the middle of the approximate 8 mile long reach of the Board's minimum stream flow application.

VII.

The Department's and Board's participation in the Commission proceeding on the Project is in the public interest because the Applicant and the Commission need to know the policies of the State of Idaho regarding the proposed hydroelectric development at the Project site.

Position of Department and Board

VIII.

The Department's position is that any preliminary permit issued by the Commission for the Project should be consistent with state water law and with the provisions of the Idaho state water plan which provides a comprehensive plan for the development of the water resources of the State of Idaho.

IX.

Prior to the issuance of a license by the Commission for applicant's Project, the Applicant should be required to have filed an application for a water right permit for the appropriation of water for the Project with the Department in compliance with state law.

MAILED
JAN 06 1989

X.

Any preliminary permit issued by the Commission should require the Applicant to respect the defined reach of the Board's minimum stream flow application.

XI.

Any preliminary permit issued by the Commission should require the Applicant to address the potential effect upon the Project of subordinating the Project to upstream depletionary uses in its feasibility studies. Specifically, to consider the subordination clause which the Department will request the Commission to include if a license is granted for the Project which reads as follows:

> The Project shall be operated in such manner as will not conflict with the future depletion and flow of the waters of the Snake River and its tributaries, or prevent or interfere with the future upstream diversion and use of such water as needed for upstream development in the public interest, or give rise to any right or claim against any future rights for the use of water, other than hydropower, within the State of Idaho initiated later in time than the priority for any rights to the use of water acquired for the project.

Basis for Department's and Board's Position

XII.

The Constitution of the State of Idaho provides that the waters of the state are subject to the regulation and control of the State. Idaho Const., art. 15, §§ 1 and 3.

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JAN 06 1989

XIII.

The Director of the Department has the affirmative duty to assess and protect the public interest with regard to water appropriation within the state. I.C. § 42-203A (Supp. 1985).

XIV.

The Constitution of the State of Idaho provides that the Idaho Water Resource Board shall have the power to formulate and implement a state water plan. Idaho Const. art. 15, § 7.

XV.

The Board, on September 27, 1984, filed a minimum stream flow application for a reach of the Warm River, which includes the project site, in accordance with Idaho Law. I.C. §§ 42-1501, 42-1505 (Supp. 1985).

XVI.

The State of Idaho has a long standing policy of subordinating hydropower water rights to upstream consumptive uses, which has recently been enacted in statutory form. I.C. § 42-203B (Supp. 1985).

XVII.

The Snake River hydrologic system is the major water system in Idaho and proper allocation of its water is essential to the overall development of the state.

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JAN 06 1989

Prayer for Relief

For the reasons given above, the Department and the Board respectfully request as follows:

1. The MOTION FOR INTERVENTION be granted for all purposes. A copy of all pleadings filed with the Commission in this matter and a copy of all progress reports or other documents that the Applicant files with the Commission regarding this Project be sent to the Idaho Department of Water Resources.

2. That any preliminary permit issued by the Commission for the Project require Applicant to respect the defined reach of the Boards' 141 cfs minimum stream flow application in its feasibility studies.

3. That any license shall not be issued by the Commission for the Project until Applicant has filed an application for a water right permit for the appropriation of water for the Project with the Department in compliance with state law.

4. That any preliminary permit issued by the Commission for the Project require Applicant to consider the inclusion of the subordination clause in a potential license as set forth in paragraph XI of this MOTION TO INTERVENE, in Applicant's feasibility studies.

FILED
JAN 06 1989

5. Any preliminary permit issued by the Commission for the Project include provisions making the Project's operations consistent with the comprehensive plan for the development of the water resources of the State of Idaho contained in the Idaho state water plan and the Board's minimum stream flow application.

6. Any license issued by the Commission for the Project include a provision subordinating the operation of the Project to upstream depletionary uses.

7. For such other and further relief as the Commission may deem just and proper.

DATED this 16th day of December, 1985.

JIM JONES
Attorney General

Ken Arment

KENNETH R. ARMENT
Deputy Attorney General
Department of Water
Resources

MICROFILMED
JAN 06 1989

CERTIFICATE OF MAILING

I HEREBY CERTIFY that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary for this proceeding which includes the following:

Mr. Jordan R. Walker
Great Western Power and Light, Inc.
484 East 300 North
Manti, UT 84642

Idaho Department of Fish and Game
c/o William Dillon, III
STATEHOUSE MAIL
Boise, ID 83720

Fred E. Springer
Director, Division of Project Management
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

DATED at Boise, Idaho this 16th day of December, 1985.

Ken Arment

KENNETH R. ARMENT
Deputy Attorney General

MICROFILMED
JAN 06 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

December 9, 1985

Great Western Power & Light, Inc.
P.O. Box N
Manti, UT 84642

Gentlemen:

This office has received and reviewed your letter dated November 25, 1985, which seeks preliminary comment on a proposed hydropower development on the Warm River in Section 29, T10N, R44E, B.M., Fremont County, Idaho.

Our records do not show that you have filed an application for permit with this Department for the proposed use. The records do show, however, that Application No. 21-7283, filed by the Idaho Water Resource Board on June 19, 1981, proposes a minimum stream flow of 141 cfs for a given reach of the Warm River. The reach is described as from NW¼NW¼ in Section 13, T9N, R43E, upstream approximately ½ mile to State Highway 47 in the SW¼SE¼ of Section 12, T9N, R43E, B.M. If established, this minimum stream flow would be an earlier water right than subsequent proposals for hydropower or other uses.

We appreciate the opportunity to comment on your proposal.

Sincerely,

A. KENNETH DUNN
Director

ls

cc: Permit No. 21-7283

MICROFILMED
JAN 06 1989

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981 application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

On September 27, 1984, application No. 21-7355 proposing the appropriation of 141 cfs from Warm River tributary to Henrys Fork. The location of the reach is the SWSE, Sec. 12, T. 9N, R. 43E, from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Sec. 10, T. 10N, R. 44E, B.M., both in Fremont County.

The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

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The Director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to the provision of Section 42-1503, Idaho Code.

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN

Director

Published in the Post Register, Ashton Herald, Fremont County Chronicle, Idaho Statesman, Lewiston Morning Tribune, and Times News on 10/17 and 10/24/85.

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JAN 06 1989

INTER-DEPARTMENT MEMO — 1

FROM Dave Tuthill

RECEIVED
AUG 31 1984
Department of Water Resources
Eastern District Office

DATE 8/8/84

TO Ernie Carlsen / Colleen Wray

SUBJECT Attached

Here is the agenda for the IWRB meetings & the proposed agenda for our hearings for the 4 remaining MSF apps. Please plan to advertise the meetings both by formal publication & by news release (which Kay Weaver will prepare). We will plan to send indiv notification to riparian owners & waterusers. Colleen — Could you also arrange meeting places? Thanks, Dave

SIGNATURE

Colleen -
Per our discussion, it appears that formal legal notice advertisement on Sept 13 & 20 would be optimum. Dave

Water Right No.	Stream	County	Date	Time	Location	Type of Meeting
21-7281 21-7283	Fall River Warm River	Fremont Fremont	Wed Sept. 26	7:30 pm	St. Anthony	Public Meeting Held by IWRB
22-7369 22-7370	Teton River Bitch Creek	Teton Fremont/Teton	Thurs Sept. 27	7:30 pm*	Driggs	Public Meeting Held by IWRB

21-7281 21-7283	Fall River Warm River	Fremont Fremont	Wed Nov. 28	8:00 am 1:00 pm	St. Anthony	Hearing Held by IDWR
22-7369 22-7370	Teton River Bitch Creek	Teton Fremont/Teton	Thurs Nov. 29	8:00 am 1:00 pm	Driggs	Hearing Held by IDWR
37-7919	Big Wood River	Blaine	To Be Determined		Hailey	Hearing Held by IDWR

* Spend the day viewing MSF's on Fall River, Warm River, Teton River and Bitch Creek.

NOTICE OF PUBLIC MEETING

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

No. 21-7281 proposing the appropriation of 140 cfs of water from Fall River tributary to Henry's Fork Snake River. The location of the reach is the NE¼SE¼, Sec. 14, T. 8N, R. 41E, upstream approximately 8 miles to State Highway 32 in the SE¼NW¼, Sec. 18, T. 8N, R. 43E.

No. 21-7283 proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NW¼, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SW¼SE¼, Sec. 12, T. 9N, R. 43E, B.M., both in Fremont County.

On Thursday, September 27, 1984 at 7:30 p.m. in the Courtroom, Teton County Courthouse, Driggs, Idaho an additional public meeting will be held to receive comments on minimum streamflow applications as follows:

No. 22-7369 proposing the appropriation of 106 cfs from the Teton River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 9 miles to State Highway 33 in the SE¼SW¼, Sec. 23, T. 6N, R. 44E.

No. 22-7370 proposing the appropriation of 28 cfs from Bitch Creek tributary to Teton River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 6 miles to State Highway 32 in the NW¼NW¼, Sec. 17, T. 7N, R. 45E, B.M., both in Teton County.

All of the above applications were filed to protect the quality of the fisheries habitat within the specified reach of each stream.

MICROFILMED
JAN 06 1989

A. KENNETH DUNN
Director

Published in the Ashton Herald, Fremont County Chronicle, Post Register, Teton Valley News on September 13 and 20, 1984

HEARING NOTES D. TUTHILL

HENRYS FORK MSF

ST ANTHONY SEP 23, 1982 21-7283

- Hearing Officer : Ken Dunn
- Staff : D. Tuthill

FULL PARTIES :

IWRB - Scott Reed

BILL JOHN ARKOOSH & Richard Graves - John Arkoosh

Freemont Co. Planning & Zoning - Jerry Reynolds

Montana Power Co - Kent Foster

Id Dept. Parks & Rec - Kurt Burkholder

Testimony: - D. Tuthill (see staff notes)

IWRB

Reed Hansen (Chairman, IWRB) Public Notice

-2 Exhibits Entered 11/19/81 21

21-7282 72-83

-Id Dept Of Parks & Rec

- Bob Meinen (Asst Director)

Exhibit 1 - Map of Dam sites on Snake River

Exhibit 2 & 3 - Upper Mesa Falls Photo

Exhibits 4 → 7 - Photos of Upper & Lower Mesa Falls.

On mesa falls, a visitor enters the canyon from ~~above~~ above, so any power development would be visible, and aesthetically desirable.

Parks Exhibit 8 & 9 - Photos Lower Mesa Falls & Upper Mesa Falls

10 - Letter from Dale Christensen

11 - Letter from Bob Meinen Re: Mento & MSF

12 - Statement of Parks & Rec

13 - Group of Letters / Pro-Public comments

Tape 3

Starting at T 10 N, the river enters a canyon, thus this is a reason that the 1000 cfs is requested below this point.

- Don Tracy
  Supt of Minidoka Project, Bureau of Rec
  Manager storage & release practices
  - Today, sept 23, flow is 400 cfs from Buffalo River + 275 from Island Park
  - Possibly should address refill after flood release as part of the subrogation Clause, per BoE's

- Bob Meinen (again)
  - How would you respond to limiting the upper reach to the flow in the Buffalo river? - Non committal

- Reed Hansen (again)
  - He would consider the filing of the board to be in the public interest, possibly not necessarily local public interest

IWRB

Marty Huebner - Nuc Eng - Id falls
for Bonneville Co Sportsman Assn
Could not respond

Tape 4

→ Prepare a transcription of Mr. Huebner's remarks & Send to him / Ken Dunn said we would do so
(- Called Mr Heubner's wife - asked if he wanted to pay for transcript - no response Dec

(Tape #5) ⇒ Virgil Moore - Fisheries Biologist for I F & G
Reg Mgr for Upper Snake R.

Most important resident trout strm in State
in terms of of hourss spent & fish taken.

~ 250,000 hrs use on this segment & others per year
Majority of users are non-resident
65% non-resident, 35% Resident (much tourist trade)

- Min flow study done in '77 indicates 300 cfs should maintain fishery in current State.

HF Provides open water area during winter for birds.
- Most winter in the Harriman Park area.
- If flows diminish, then freezing is more likely.
- Only natural reproduction.
- Minimal impact on the fishery would occur via falls.
- Aesthetic qualities could decline.
- If the river is regulated differently, there could be an impact on fisheries

MICROFILMED

- Reese Madsen

Wildlife Biologist from Red Rock Lakes Natl Wildlife Refuge, interested in the Midcontinental flock of Trumpeter Swans, that winter on Henrys Fork. Loss of wintering grounds is the limiting factor. 30% of their birds winter on the Henry's Fork. (Statement submitted as IWRB Exhibit 3) 300 cfs is barely sufficient.

John Arkoosh

- Served as his own witness
- Contends that 1000 cfs to be left in the river would be wasteful.

Tape 5

- concl.

Kent Foster

- Robert Perryman Hydroelectric Engineer w/ Montana Power C.E. from Montana
- Acquired site in 1914
- 1981 spent $20,000 for study to apply for FERC app
  1017 cfs avg flow
  322 cfs critical flow 7.5 MW Plant
  Implementation of MSF would Reduce plat to 2.7 MW
  This would make the project infeasible
- Richard Davenport - Senior Planning Eng w/ Montana Power P.E.
  Site now valued at $2,000,000
  Power generation = $3000 K
  Costs $2700 K

- Richard Davenport (cont.)

Public Statements

- Ron Waters - Left statement
- Reid Oldham - Chairman of the Committee of Nine
- Susan McKenna
  Left Signatures of 792 people opposed to development of Upper Lower Mesa Falls
- Calvin Wickham (Manager of Fall River Electric)
- Leigh Chantrill - Opposed
- Dennis Bitton - Federation of Fly fishers & Trout Unlimited
- ~~EX~~ Chuck ~~Bossey~~ Dawsey (Ashton) - Electrical Engineer

Record open until Oct 1.

MICROFILMED

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
NEW WATER RIGHT FILINGS

POOR QUALITY

INDICATES TYPEAL

RIGHT NUMBER	NAME AND ADDRESS	PRIORITY DATE	USE	USE PERIOD FROM	USE PERIOD TO	MAX AMOUNT MAX RATE	DIVERSION POINT	PLACE OF USE AND ACREAGE	BASIS FOR RIGHT
21-7281	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-12-1981	MINIMUM STREAM FLO	01-01	12-31	140.00 CFS	NESE S14 TOWN R41E SENW S18 TOWN R43E	NESE S14 TOWN R41E	APPLICATION
	SOURCE: FALL RIVER OTHER USES: MAINTAIN FISHERY HABITAT. REMARKS: SEE MAP FOR LOCATION OF REACH.			TRIBUTARY: SNAKE RIVER, HENRYS FORK					
21-7282	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-12-1981	MINIMUM STREAM FLO	04-01	09-30	1000.00 CFS	N-NW S33 NWNW T13N R43E SENE S25 T10N R43E	S33 T13N R43E	APPLICATION
	SOURCE: HENRYS FORK REMARKS: SEE MAP FOR LOCATION OF REACH.			TRIBUTARY: SNAKE RIVER					
						300.00 CFS		NWNW S33 T13N R43E	
21-7283	IDAHO WATER RESOURCE BOARD STATEHOUSE MAIL BOISE ID 83720	06-12-1981	MINIMUM STREAM FLO	01-01	12-31	141.00 CFS	NWNW S13 T09N R43E S-SE S12 T09N R43E	NWNW S13 T09N R43E	APPLICATION
	SOURCE: FALL RIVER OTHER USES: MAINTAIN FISHERY HABITAT. REMARKS: SEE MAP FOR LOCATION OF REACH.			TRIBUTARY: SNAKE RIVER, HENRYS FORK					

Yours of 8/5/81 advertised these apps as you suggested in your letter of 7/31/81. But hearing will be scheduled during next actv. of the same apps.

RECEIVED
AUG 5 1981
Department of Water Resources
Eastern District Office

WITHDRAWN
JAN 06 1989

3/79

IDENT. NO. 21 7283

IDAHO DEPARTMENT OF WATER RESOURCES

WATER RIGHT
DATA ENTRY LOG

Initials	Date	Item
kw	7/8/81	Original form entered
		Edit Report Correct
		Date Protested
		Date of Hearing
		Date Approved/Denied (Proof due date, stage and/or status, conditions of approval, water district)
		Record Verified
		Amendment Approved
		Extension Approved
		Partial Proof
		Proof Complete
		Field Exam Received
		Field Exam Accepted and changes entered
		License Signed
		Transfer Approved
		Keypunched by State Office

September 2, 1981

RE: Application for Permit No. 21-7281, 21-7282, 21-7283

IDAHO WATER RESOURCE BOARD

Ashton Herald
P.O. Box 258
Ashton, ID 83420

Gentlemen:

Would you please submit an affidavit of publication and certified bill in connection with the above referenced application(s). The legal notice was to have been published in your paper on August 13 and 20, 1981.

Your cooperation in this matter is greatly appreciated.

Very truly yours,

COLLEEN WRAY
Adm. Secretary

MICROFILMED
JAN 06 1989

STATE OF IDAHO

DEPARTMENT OF HEALTH AND WELFARE

DIVISION OF ENVIRONMENT
636 Pershing
Pocatello, Idaho
83201

11 August 1981

Ernest Carlsen, Asst. Rgnl. Supervisor
Department of Water Resources
150 Shoup
Idaho Falls, Idaho 83401

Re: Applications #21-7281-82-83
#22-7369-70

Dear Mr. Carlsen:

We have reviewed the following applications for permits to appropriate the public waters of the State of Idaho, submitted by the Idaho Water Resource Board, Boise.

#21-7281 - Source Fall River (Fremont County)

#21-7282 - Source Henry's Fork (Fremont County)

#21-7283 - Source Warm River (Fremont County)

#22-7369 - Source Teton River (Teton County)

#22-7370 - Source Bitch Creek (Teton County)

Permit #22-7370, Bitch Creek is an unclassified tributary to the Teton River and is appropriate for maintenance of spawning. All the streams, with the exception of Bitch Creek, are special resource waters designated for cold water biota and salmonid spawning, and are appropriate for the maintenance of a quality fishery.

We concur with any comments provided by the Department of Fish and Game concerning necessary water volumes.

If we can be of further assistance, please contact this office at #236-6160.

Sincerely,

Craig Shepard

Craig W. Shepard
Sr. Environmental Specialist

RECEIVED
JAN 06 1989

CWS/md
CC: Gordon Hopson

EQUAL OPPORTUNITY EMPLOYER

Notice is hereby given that the following application has been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has on June 19, 1981 submitted application 21-7283 for a permit to the Department of Water Resources proposing the appropriation of 141 cubic feet per second of water within the NW¼NW¼, Sec. 13, Twp. 9N, Rge. 43E, Fremont County to preserve the minimum stream flow subject to all prior water rights for maintaining the present quality of fisheries and provide adequate spawning and rearing conditions year around in Warm River tributary of Henry's Fork Snake River.

Pursuant to Title 42, Chapter 15 of the Idaho Code a legal notice will be published at a later date setting a time and place for a hearing during which opportunity will be provided for public comment.

A. KENNETH DUNN

Director

Published in the Ashton Herald 8/13 & 8/20/81.

MICROFILMED

JAN 05 1989

July 10, 1981

RE: Applications for Permits No. 21-7281, 21-7282, 21-7283
21-7369, 22-7370

IDAHO WATER RESOURCE BOARD

Elmer W. Smith, P.E.
Environmental Engineer
Department of Health & Welfare
636 Pershing
Pocatello, Idaho 83201

Dear Mr. Smith:

We are enclosing copies of applications that may be of interest to your agency. Please review the applications and submit any comments you may have to our Department as soon as possible.

If we may be of further assistance, please feel free to contact us.

Respectfully submitted,

ERNEST CARLSEN
Assistant Regional Supervisor

EC:cw:kw

Enclosures

MICROFILMED
JAN 06 1989

July 10, 1981

RE: Applications for Permits No. 21-7281, 21-7282, 21-7283
21-7369, 22-7370

IDAHO WATER RESOURCE BOARD

Mr. Tom Reinecker
Regional Supervisor
Department of Fish & Game
1515 Lincoln Road
Idaho Falls, Idaho 83401

Dear Tom:

We are enclosing copies of applications that may be of interest to your agency. Please review the applications and submit any comments you may have to our Department as soon as possible.

If we may be of further assistance, please feel free to contact us.

Respectfully submitted,

ERNEST CARLSEN
Assistant Regional Supervisor

EC:cw:kw

Enclosures

MICROFILMED
JAN 06 1989

July 10, 1981

RE: Applications for Permits No. 21-7281, ~~21-7282~~, 21-7283
21-7369, 22-7370

IDAHO WATER RESOURCE BOARD

State Department of Parks & Recreation
Statehouse
Boise, Idaho 83720

Gentlemen:

We are enclosing copies of applications that may be of interest to your agency. Please review the applications and submit any comments you may have to our Department as soon as possible.

If we may be of further assistance, please feel free to contact us.

Respectfully submitted,

ERNEST CARLSEN
Assistant Regional Supervisor

EC:cw:kw

Enclosures

FILMED
JAN 06 1989

21-7283

IDAHO WATER RESOURCE BOARD

STATEHOUSE MAIL. BOISE. ID 83720

Source: WARM RIVER tributary to SNAKE RIVER. HENRYS FORK

Date Filed: 06/19/1981

Amount: 141.00 CFS

Diversion Point: NWNW Sec 13 T 09N R 43E SWSE Sec 12 T 09N R 43E.
FREMONT Co.

Use: MINIMUM INSTREAM FLOW (141.00 CFS) from 01/01 to 12/31

Place of Use: NWNW Sec 13 T 09N R 43E

Diversion Means: GAGING STATION.

MICROFILMED
JAN 06 1989

LEGAL0-PRUF

59634

LEGAL NOTICE

Notice has been given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW.

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications fo rpermits to the Department of Water Resources:

On June 19, 1985, application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNW, Sec. 13, T. 9N, R. 43E, upstream approximately ½ mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

On Sepetember 27, 1984, application No. 21-7355 proposing the appropriation of 141 cfs from Warm River tributary to Henrys Fork. The location of the reach is the SWSE, Sec. 12, T. 9N, R. 43E, from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Section 10, T. 10N, R. 44E, B.M., both in Fremont County.

The applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

The director of the Department of Water Resources will hold a public hearing on the applications in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho at 9:30 a.m. November 20, 1985, for the purpose of hearing evidence in regard to the applications. The hearing will be held pursuant to th provision of Section 42-1503, Idaho Code.

Any party who wishes to formally appear at this proceeding for the purpose of presenting evidence or cross-examining witnesses should file a notice of appearance with the Director of the Department of Water Resources, Statehouse, Boise, Idaho, five (5) days prior to the hearing. Other parties will be given an opportunity to informally present their views and comments without the necessity of filing a notice of appearance.

If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

¾6031 Legl Idaho Dept. of Water
Oct. 17 and 24 012.3 IN 10¾10
12:12

LEGAL NOTICE

Notice is hereby given that the following applications have been submitted for permit to appropriate the public waters of the State of Idaho:

NOTICE OF APPLICATION FOR MINIMUM STREAM FLOW

Notice is hereby given that the Idaho Water Resource Board has submitted the following applications for permits to the Department of Water Resources:

On June 19, 1981 application No. 21-7283 proposing the appropriation of 141 cfs of water from Warm River tributary to Henrys Fork Snake River. The location of the reach is the NWNE, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SWSE, Sec. 12, T. 9N, R. 43E.

On September 27, 1984, application No. 21-7355 proposing the appropriation of 141 cfs from Warm River tributary to Henrys Fork. The location of the reach is the SWSE, Sec. 12, T. 9N, R. 43E, from State Highway 47 upstream approximately 8 miles to Warm River Springs in the NWSW, Sec. 10, T. 10N, R. 44E, B.M., both in Fremont County.

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If issued the permit will be subject to all prior water rights.

A. KENNETH DUNN
Director

PUBLISH: **Thursday,** October 17, and 24, 1985.

List of Exhibits

WARM RIVER MSF

IDWR

1. Minimum Stream Flow Facts (21-7283)
2. Minimum Stream Flow No. 21-7283 (Warm River) map of reach
3. Minimum Stream Flow Facts (21-7355)
4. Minimum Stream FLow No. 21-7355 (Warm River) map of reach
5. Summary Hydrograph
6. Natural Flow - Snake River Graph
7. Warm River Hydrographic Information

Fish and Game

1. Fishery Research Job Performance Report (F-73-R-6)
2. Fishery Research Job Performance Report (F-73-R-7)
3. Creel Census on Warm River, 1984

4-10. Slides of Fall River

11. Slide of Snorkle Population Results
12. P. 32 of Fishery
13. P. 31 of Fishery
14. Qualification of Tim Cochnauer
15. Stream Flow Invesitgation

15. Rearing Flow Curve for Warm River

MICROFILMED

JAN 06 1989

FISH AND GAME Exhibit #1
Admitted 11-20-85
BDF

FISHERY RESEARCH

IDAHO FISH & GAME

FEDERAL AID IN FISH RESTORATION

Job Performance Report, Project F-73-R-6
Subproject IV: River and Stream Investigations
Study III: Henrys Fork Fisheries Investigations



Robert Spateholts
Fishery Technician

Virgil Moore
Regional Fishery Manager

February, 1985

MICROFILMED
JAN 06 1989

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JOB PERFORMANCE REPORT

State of: Idaho Name: RIVER AND STREAM INVESTIGATIONS

Project No.: F-73-R-6 Title: Henrys Fork Fisheries Investigations

Subproject No.: IV

Study No.: III

Job No.: 1

Period Covered: March 1, 1983 - February 28, 1984

ABSTRACT

An extensive survey of fish population abundance, species composition, and age and growth was conducted using electrofishing and snorkel census techniques in Robinson Creek, Warm River, Falls River, Buffalo River and their tributaries. Trout were also tagged for migration studies.

Brook trout were the most abundant salmonid species and were found in all waters except above impassable falls in Robinson and Wyoming creeks. Rainbow trout, rainbow x cutthroat hybrids, cutthroat, and brown trout were also collected. Population estimates of age I+ and older trout ranged from 3/km in Boone Creek to 5,057/km in Buffalo River, with estimates at most transects ranging from 200-500 fish/km. Only 2.3% of the tags placed on trout in Henrys Fork tributaries were returned by anglers in 1983, and only one fish had moved from the location of tagging.

The oldest fish sampled were age V+ rainbow trout and age IV+ brook trout. Few fish exceeded age III+. Growth of trout was quite variable between streams, but was consistently slower than growth of trout from the Henrys Fork. Best growth was exhibited by brown trout stocked as fry in 1981 and 1982 in Warm River and Robinson Creek drainages. Estimates of annual survival of trout were generally very low, ranging from 6% to 52% for brook and rainbow trout. Because brook trout populations show slow growth and low annual survival, yield to anglers should be increased by a brook trout bonus limit for all Henrys Fork tributaries.

Several natural and man-made barriers to fish migration exist within the study area. Of special interest is an impassable waterfall on Robinson Creek, above which an isolated population of cutthroat trout exists without threat of hybridization with rainbow trout, or of competition with brook trout.

Forest Service General Aquatic Wildlife Survey (GAWS) and Region 1 (R1) habitat survey data and spawning and pool habitat survey maps are

included and discussed. GAWS and R1 data were generally poor predictors of fish abundance and biomass. Spawning and pool habitat were generally classified as fair to very good, and no streams were classified as very poor habitat.

Authors:

Robert Spateholts
Fishery Technician

Virgil Moore
Regional Fishery Manager

INTRODUCTION

The Henrys Fork (North Fork) of the Snake River in eastern Idaho (Fig. 1) supports a major fishery. The Henrys Fork Investigations research project was initiated in 1976 to assess fish population abundance, angler use, fish harvest, and the effects of various regulations on the fishery. The tributary study was initiated in 1983 to assess fish populations, angler use, fish harvest, and to obtain baseline data for development of a management plan for major tributaries (Buffalo River, Warm River, Robinson Creek, and Falls River) between Island Park Dam and St. Anthony, Idaho. The major goal in 1983 was to conduct an extensive inventory of the status of fish populations in Henrys Fork tributaries.

OBJECTIVES

To determine presence and abundance of salmonids in the Falls River, Warm River, and Robinson Creek drainages.

To mark or tag adult and juvenile fish to determine movement patterns.

To determine spawning and rearing potential of the Buffalo River.

To evaluate age and growth of salmonids.

To document use of all tributaries by spawning salmonids from the Henrys Fork.

RECOMMENDATIONS

Conduct quantitative creel census to determine angler effort and harvest in Henrys Fork tributaries.

Determine the need for regulations to protect native cutthroat trout in Robinson Creek and Falls River drainages.

Extend the bonus brook trout limit to all Henrys Fork tributaries.

STUDY AREA

The Henrys Fork Basin above Falls River has a total drainage area of 2,770 km^2, and the Falls River drains an additional 844 km^2. Altitude ranges from 1,600 m on the Snake River Plain to over 3,000 m at the Continental Divide, and mean annual precipitation is about 90 cm. Most of the drainage is on federal lands, and primary land uses include recreation and forestry. On the Snake River Plain, the primary land use is

agriculture. Geologic formations in the drainage are primarily volcanic in origin, including the Plateau and Yellowstone rhyolitic formations and the basaltic Island Park caldera (Whitehead 1978).

Numerous springs emerge at the base of bluffs of the Plateau's rhyolite formation and constitute most of the flow in Big Springs Creek (Henrys Fork above Henrys Lake Outlet), Buffalo River, and Warm River. The combined flow of springs from this formation is over 1,300 m^3/sec, which is more than 40% of the annual discharge of the Henrys Fork above Falls River. The springs range in discharge from less than 1 f^3/sec (Ashton Hot Springs) to 446 m^3/sec (Big Springs). Warm River Springs has a discharge of 437 m^3/sec at a constant temperature of 11 C, pH of 7.2, and specific conductance of 125 micromhos (Whitehead 1978).

Four major tributary systems were surveyed in 1983 (Fig. 1). Buffalo River has a drainage area of 153 km^2, mean annual discharge of 5.1 m^3/sec, and peak discharge of 14.4 m^3/sec. Warm River has a drainage area of 375 km^2, mean annual discharge of 6.0 m^3/sec, and peak discharge of 25.6 m^3/sec. Robinson Creek drains 326 km^2 and has a mean discharge of 3.4 m^3/sec (peak discharge 34.2 m^3/sec). Falls River drains 844 km^2 with mean annual discharge of 22.0 m^3/sec (Whitehead 1978).

Conductivity of Henrys Fork tributaries ranges from 40-140 micromhos, which is on the low end of the normal range of values for fresh waters (50-1,000 micromhos). The pH values range from 7.5-8.0, which are nearly optimal for aquatic life, and midsummer water temperatures are suitable for trout survival. Chemical analyses of water samples from several springs and streams within the study area can be found in Whitehead (1978).

TECHNIQUES USED

Study Site Selection

Study sites were chosen to represent typical habitat in all streams surveyed, from small headwater streams to the mainstem of the major tributaries. On the larger streams, we had more than one transect, and they varied in length (60-650 m) to include pool and riffle habitat types. Transects on Warm River, Fish Creek, Porcupine Creek, Conant Creek, and Boone Creek corresponded to stations evaluated by Smith (1981, 1982) with the GAWS (General Aquatic Wildlife Survey) habitat survey method.

With the exception of Little Robinson Creek in Yellowstone National Park, all transects were located within 0.5 km of roads. Many of the roads are gated by the Forest Service and not accessible to the general public. Much of Warm River, Robinson Creek, Falls River, Conant, and Squirrel creeks are in steep canyons and are relatively inaccessible. We were able to sample Warm River and Robinson Creek by snorkeling, but poor

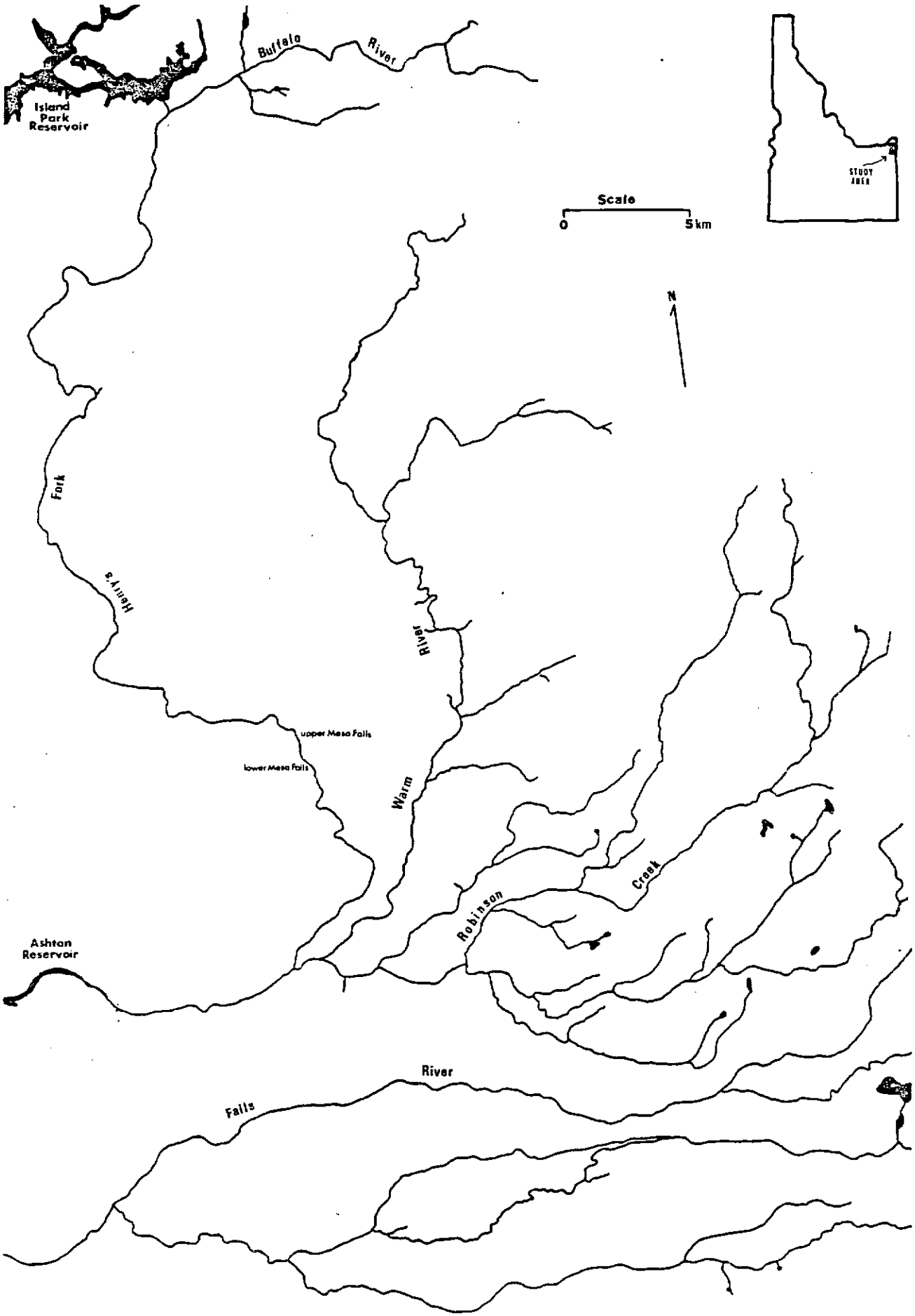


Figure 1. Map of Henrys Fork of the Snake River from Island Park Reservoir to Ashton Reservoir showing tributary drainages surveyed in 1983.

visibility in the other waters prevented us from obtaining fish population data by this method. Electrofishing and snorkel transects for Robinson Creek and tributaries are shown in Figure 2, for Warm River and tributaries in Figure 3, for Falls River and tributaries in Figure 4, and for Buffalo River and tributaries in Figure 5.

Sampling Techniques

Electrofishing was used to capture fish for population estimates, tagging, and age-growth studies. We used a DC shocker mounted in a drift boat to shock in lower Warm River on June 20. Low conductivity forced us to use continuous direct current. All other electrofishing was done with pulsed DC backpack shockers.

Shocked trout were anesthesized with MS-222, measured to the nearest millimeter, and weighed to the nearest gram. Trout larger than 200 mm were tagged with individually numbered monel jaw tags, and smaller trout were given fin clips for future recognition (Appendix A for a list of fin clips). Scale samples were taken from a representative sample of trout from each water for age and growth studies. Total lengths were recorded for representative samples of whitefish, sculpin, suckers, shiners, and dace.

Trout Population Estimates - Electrofishing

Several techniques were used to estimate fish abundance in the various waters, depending on size of the stream, water clarity, and efficiency of electrofishing. On small streams (less than 10 m wide with pools less than 1 m deep) repetitive passes were made through a transect to obtain depletion population estimates. Natural barriers such as shallow riffles, waterfalls, or beaver dams were used as the upstream and downstream ends of our transects. We assumed that no fish migrated into or out of the transect during the sampling period. Shocking started at the downstream end of the transect and proceeded upstream. Trout were netted quantitatively, and representative samples of other species were taken. At the end of the first run, we processed the fish and either released them downstream from the transect or held them in buckets.

A second pass through the transect was made. If fewer than 50% of the number of trout sampled on the first run were captured on the second run, the population was considered adequately depleted. For transects sampled with two passes, the formula of Seber and LeCren (1967) was used as follows:

$$\hat{N} = \frac{(V_1)^2}{(V_1 - V_2)}$$

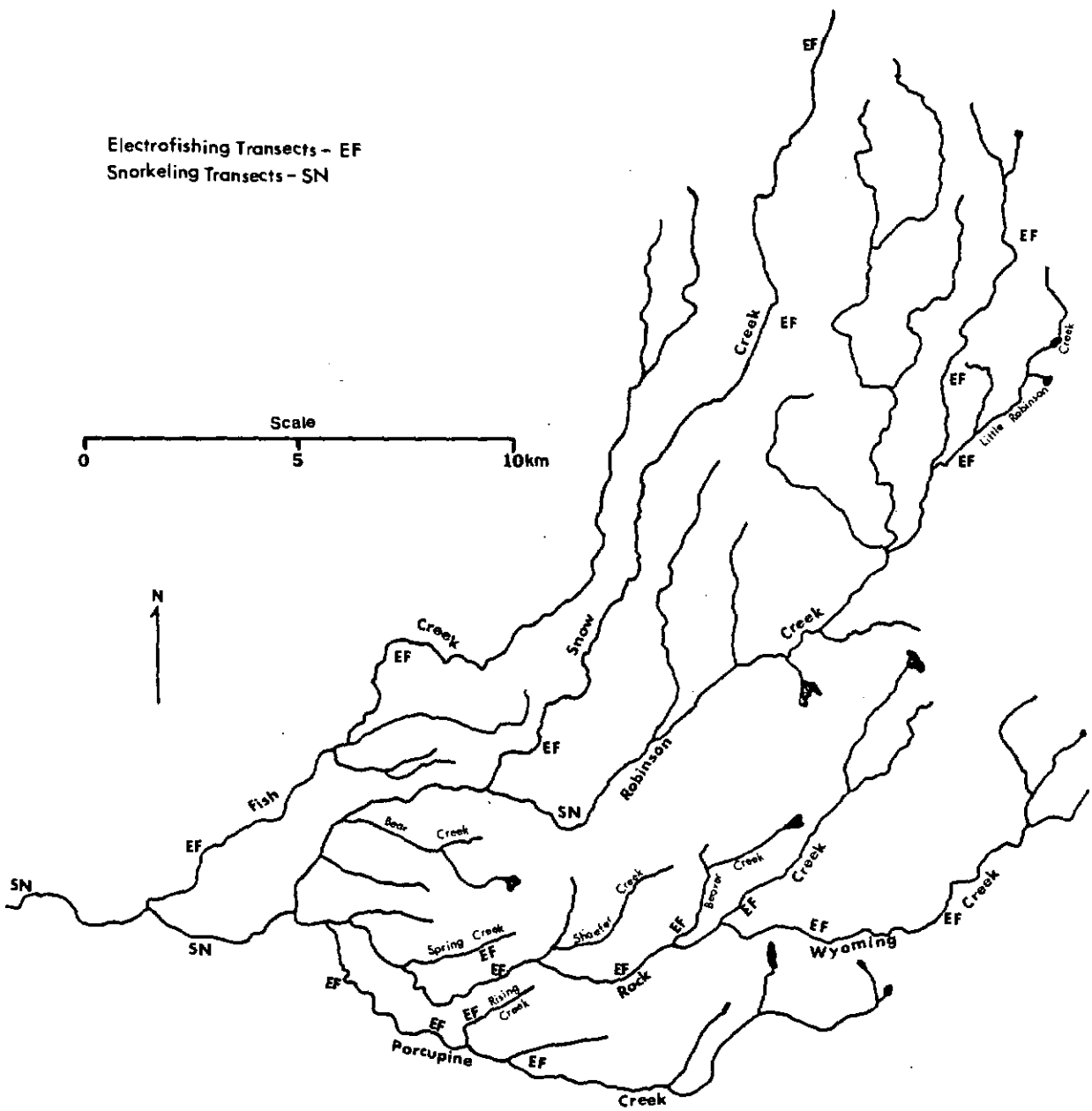


Figure 2. Locations of electrofishing and snorkel transects in Robinson Creek and tributaries, 1983.

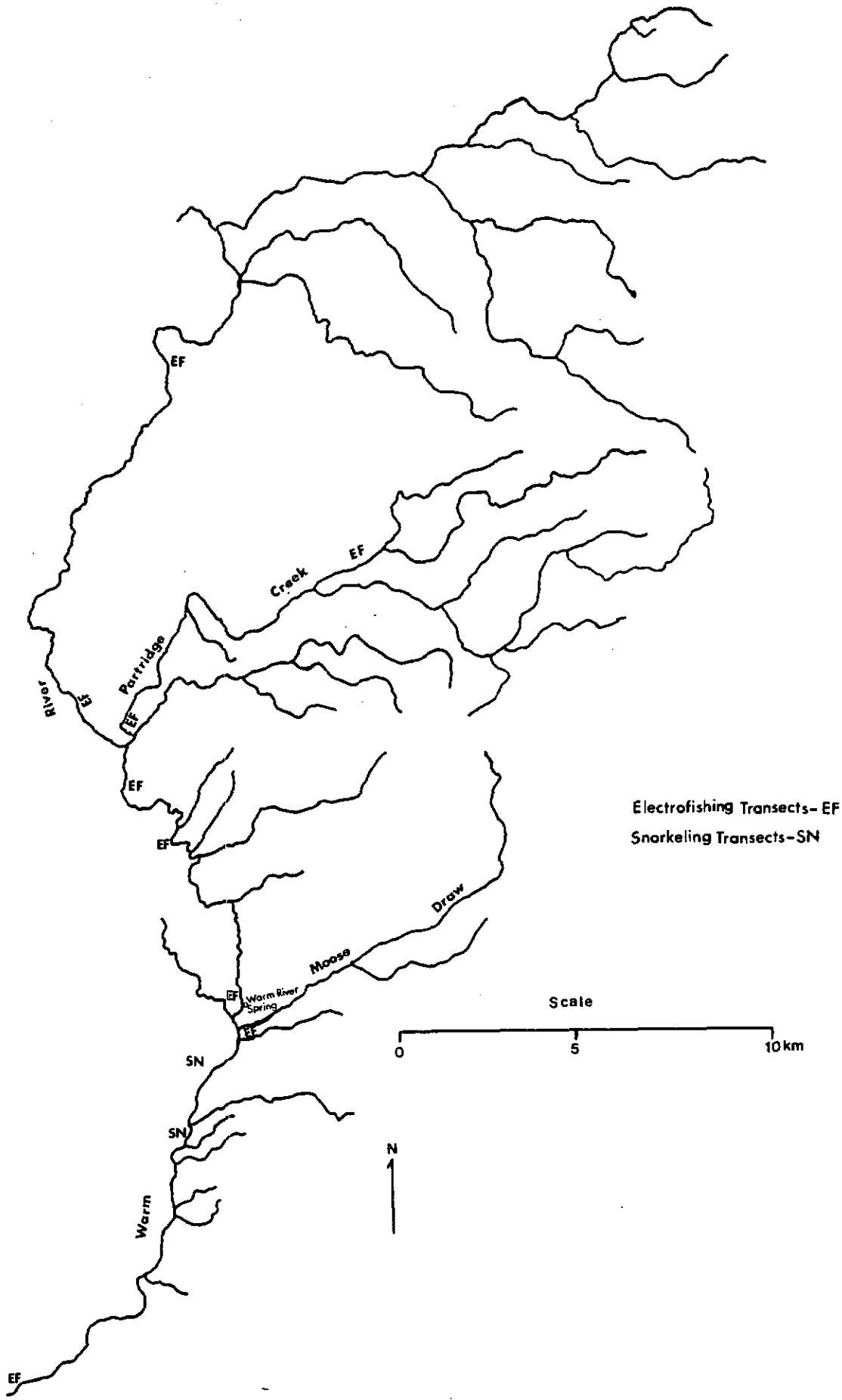


Figure 3. Locations of electrofishing and snorkel transects on Warm River and tributaries, 1983.

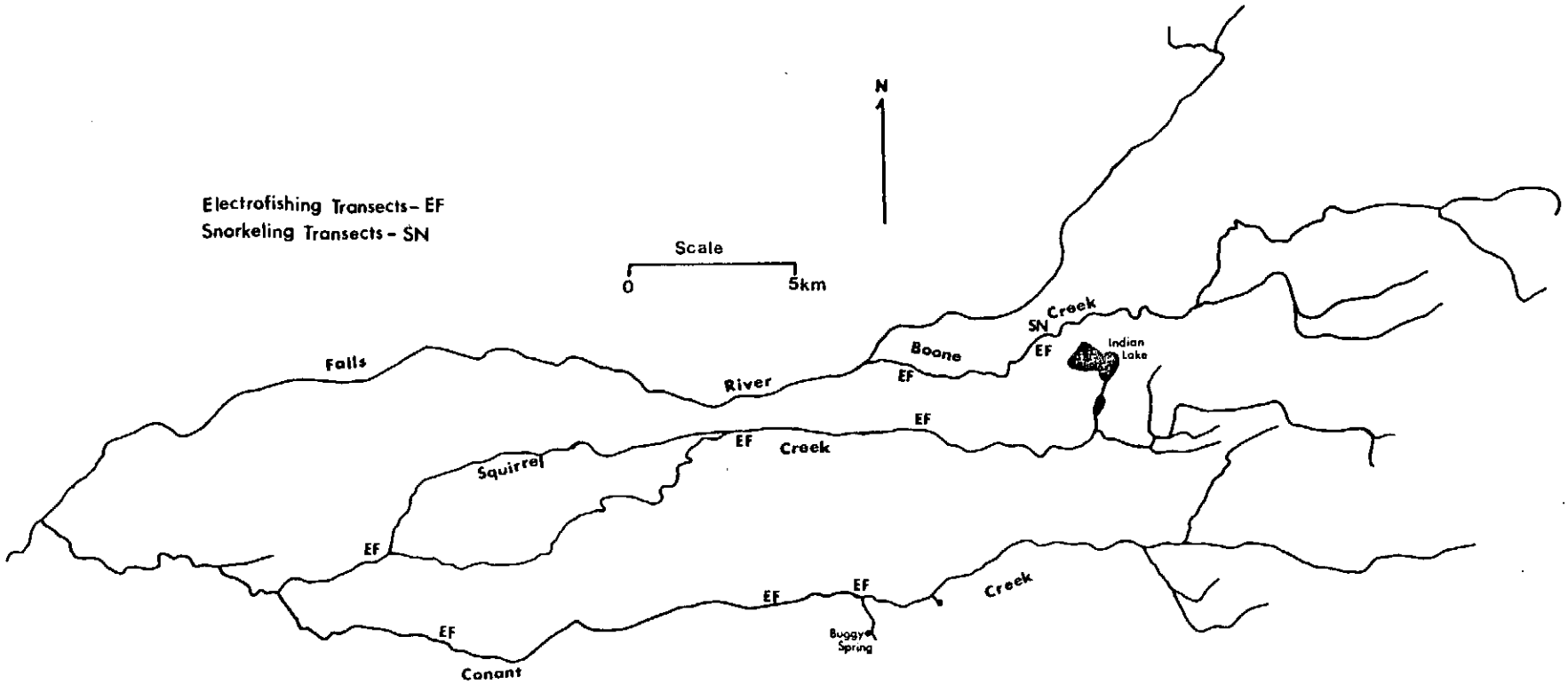


Figure 4. Locations of electrofishing and snorkel transects on Falls River and tributaries, 1983.

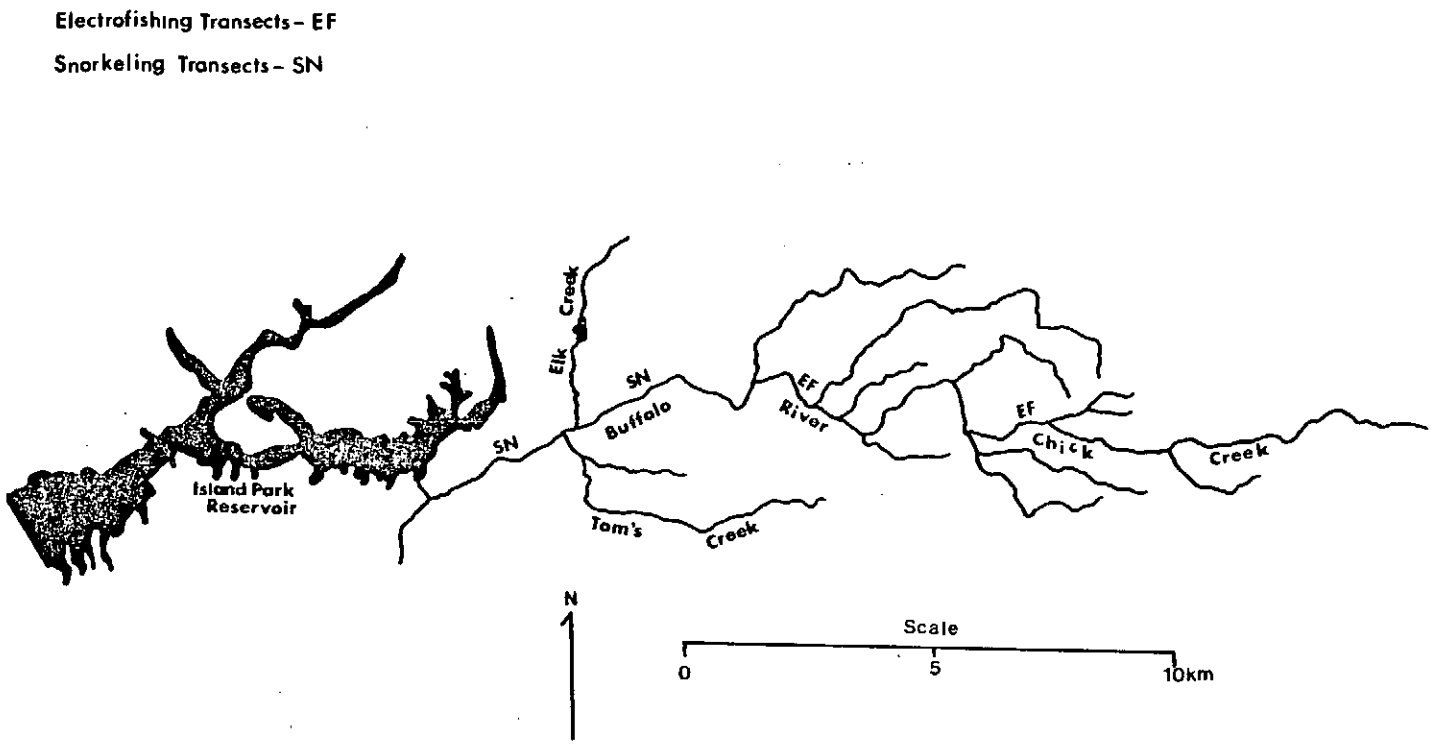


Figure 5. Locations of electrofishing and snorkeling transects on Buffalo River and tributaries, 1983.

Where: $\hat{N}$ = fish population estimate
V_1 = the number of fish collected on the first pass
V_2 = the number of fish collected on the second pass

$$\text{and } SE[\hat{N}] = \sqrt{\frac{[V_1]^2 \times [V_2]^2 \times T}{[V_1 - V_2]^4}}$$

Where: $SE[\hat{N}]$ = the standard error of the population estimate
T = the total number of fish collected $[V_1 + V_2]$

If more than 50% of the number of trout sampled on the first run were captured on the second run, a third run was made through the transect. It was occasionally necessary to do a fourth pass if more than 50% of the number of trout captured on the second pass were caught on the third run. The Zippin (1958) method was used to estimate populations sampled with three or four removals using a maximum likelihood estimator,

$$R = \frac{\sum_{i=I}^{k} [i-I]Vi}{T}$$

as described by Platts et al. (1983).

On larger streams (10-15 m wide with pools >1 m deep) mark-recapture estimators were used due to inability to capture sufficient fish for depletion estimators. All trout were marked with tags or fin clips and returned to the transect. After 1 to 11 days, a recapture run was made. Trout were examined for previous marks. New fish were marked for identification in future studies. Areas above and below our marking transect were shocked to determine if fish had moved upstream or downstream since the marking sample. If no movement was detected (no marked fish captured above or below marking transect), only fish sampled in the original transect were used for the population estimate. If movement did occur, the upstream and downstream samples were included in our population estimate. A modified Peterson mark-and-recapture formula (Ricker 1975) was used to estimate fish populations as follows:

$$\hat{N} = \frac{[M+1][C+1]}{[R+1]}$$

Where: $\hat{N}$ = the population estimate
M = number of fish marked
C = number of fish in the recapture sample
R = number of marked fish in the recapture sample

with a standard error $[SE[\hat{N}]]$ of:

$$SE[\hat{N}] = \sqrt{\frac{[\hat{N}^2][C-R]}{[C+1][R+2]}}$$

A multiple mark recapture technique (Schnabel 1938) was used to estimate the trout population in Rock Creek below Road 490 using angling on 12 July to mark and electrofishing to obtain recapture samples on 13 and 14 July. The Schnabel formula with the Chapman modification was used (Ricker 1975):

$$\hat{N} = \frac{\Sigma MC}{\Sigma R+1}$$

where: $\hat{N}$ = the population estimate
ΣMC = the sum of the products of total catch and total number of marked fish at large for each sample
ΣR = the sum of recaptures for all samples

with standard error: $SE(\hat{N}) = \frac{1}{\sqrt{\frac{ER}{(\Sigma MC)^2}}}$

Young-of-the-year trout were not adequately sampled from most transects to obtain estimates of total numbers. Most of the population estimates obtained for Henrys Fork tributaries in 1983 are for age I+ and older (usually larger than 80 mm) trout which were fully vulnerable to electrofishing. For transects on smaller streams where young-of-the-year were adequately sampled, separate estimates were calculated for young-of-the-year and age I+ and older fish.

Trout Population Estimates - Snorkeling

The mainstems of Warm River, Robinson Creek, and Buffalo River were too large or inaccessible to sample effectively by electrofishing, but had sufficient water clarity that the trout populations could be counted using conventional snorkeling gear. We used two methods to estimate trout populations: direct enumeration and area-density counts.

Direct enumeration counts were done in Boone Creek near Indian Lake and in Robinson Creek at the end of Road 470 where visibility was at least 50% of the stream width. In those areas, the entire channel could be counted by two observers. One observer moved upstream along one bank and counted out towards the center of the stream and counted all trout between himself and the center. The other diver moved upstream in the center of the channel and counted all trout between himself and the opposite bank.

Two replicate counts were made in Robinson Creek, and a single count was made in Boone Creek. The number of trout of each species larger and smaller than 330 mm were recorded. Since the entire stream channel was counted by this method, the population estimates for the transects were the means of the replicate counts for each species.

In areas that could not be counted from bank-to-bank by two divers, we used area-density methods to estimate trout populations (Schill 1983). Divers crawled upstream at arm's length from the bank and counted out towards the center of the stream. The number of trout of each species greater and less than 330 mm total length were recorded. When divers reached the upstream end of the transect, they floated back downstream in the center of the channel counting fish seen in both directions. Each diver made three replicate counts of bank and center strips of the transect.

The total numbers of trout in each transect were estimated by summing the estimates for each bank with an estimate for the center based on the densities of trout observed while drifting downstream. Visibility was determined each day as the maximum distance at which an object similar in size to the fish in the transect could be identified (Schill 1983). We later returned and measured the area of the transect. The area included in the bank portions of the transects were obtained by multiplying the length of bank snorkeled by visibility + 1 m (since we crawled upstream at arm's length from the bank). Fish abundance in the bank areas was estimated by averaging the replicate counts.

The area covered by the center counts was the product of the transect and two times the visibility (since divers counted to both sides). Mean density of trout in the center area was estimated by dividing the mean of the replicate counts by the area covered by the center counts. Total numbers of trout in the center area was estimated by multiplying mean density by total center area (total transect area minus bank areas). Estimates of total numbers of trout in the transect were then obtained by adding the bank area estimates to the center area estimate.

Fish Movements

Signs requesting anglers to provide information on species, size, location caught, and tag numbers of tagged fish caught were posted at access points throughout the drainage. Fish movements were assessed from information supplied by anglers who caught tagged fish. The distance moved upstream or downstream from the point of tagging was recorded for all tag returns whenever possible.

Age and Growth

Scales were obtained from 471 brook trout, 88 wild rainbow trout, 17 rainbow-cutthroat trout hybrids, 31 cutthroat trout, 50 brown trout, and 8 mountain whitefish from Henrys Fork tributaries in 1983. Wet mounts of scales were viewed at 93x magnification, and distances to annuli and to the scale margin along the anterior radius of the largest non-regenerated scale in each sample were recorded to the nearest millimeter. Since annuli were very distinct and age groups by scale analysis corresponded well to length-frequency distributions, it was unnecessary to recheck age

determinations for brook trout, rainbow trout, and rainbow-cutthroat hybrids. Scales from all brown trout, cutthroat trout, and whitefish were re-read with nearly 100% agreement.

Body-scale regressions were performed for each species at each sampling location. Lengths at annuli were back-calculated using the traditional Lee equation:

$$L_N = C + \frac{S_N}{S}(L-C)$$

where: L_N = back-calculated length at annulus N
C = correction factor (intercept of body-scale regression or length at scale formation)
S_N = radius of scale to annulus N
S = radius of scale to margin
L = total length of fish at capture

No correction factor was applied for back-calculating lengths at annuli for brook trout or whitefish based on body-scale regressions for brook trout and literature values for whitefish listed in Carlander (1976). Since sample sizes were small for other species and the body-scale regressions had poor fits, I chose literature values of 35 mm for wild rainbow and rainbow-cutthroat hybrids, 30 mm for cutthroat trout, and 40 mm for brown trout from Carlander (1976) to use as correction factors for back-calculating lengths at annuli.

Survival

The range in length for each age class (determined from representative scale samples) were applied to length-frequency distributions of total catch to determine the number of fish from each age class sampled by electrofishing from Henrys Fork tributaries in 1983. Catch curves (natural logarithm of number of fish vs age) were plotted to determine at which age fish were completely recruited. The mortality coefficient (Z) and annual survival (S) were computed from catch curves as described by Ricker (1975).

Migration Barriers

Natural and man-made barriers to fish migration were located by examining topographic maps and surveying the Henrys Fork tributaries in 1983. Natural barriers consisted of waterfalls and steep cascades. Man-made barriers included dams (irrigation and hydrodams) and culverts. Barriers to fish migration were photographed, and their locations were noted.

Spawning Activity

Rainbow trout spawning activity was observed in Warm River from the Highway 47 bridge to 3 km above Warm River campground on March 24, 1983 and March 22, 1984. Redd counts were performed by snowmobiling along the bank and along the abandoned railroad right-of-way paralleling the river.

FINDINGS

Fish Species Distribution

Twelve species of fish were collected by electrofishing or observed while snorkeling in Henrys Fork tributaries in 1983 (Tables 1-4). Salmonid species included: brook trout (*Salvelinus fontinalis*), rainbow trout (*Salmo gairdneri*), cutthroat trout (*Salmo clarki*), rainbow-cutthroat hybrids, brown trout (*Salmo trutta*), and mountain whitefish (*Prosopium williamsoni*). Cutthroat trout and mountain whitefish are the native salmonid species in the upper Henrys Fork drainage (Simpson and Wallace 1978). Natural reproduction of all species occurs in the study waters, and rainbow and brown trout are stocked in many streams.

Other species sampled include sculpins, Utah suckers (*Catostomus ardens*), mountain suckers (*Catostomus platyrhynchus*), longnose dace (*Rhinichthys cataractae*), speckled dace (*Rhinichthys osculus*), and redside shiners (*Richardsonius balteatus*). Utah chubs (*Gila atraria*) are present in the drainage (Simpson and Wallace 1978), but were not collected or observed in Henrys Fork tributaries in 1983. Both mottled sculpin (*Cottus bairdi*) and piute sculpin (*C. beldingi*) are reported native to the drainage by Simpson and Wallace (1978), but they were not distinquished from each other in this study.

Salmonid Abundance and Species Composition

Electrofishing Samples

Numbers of fish sampled, mean lengths, mean weights, and condition factors of trout collected for all transects on Henrys Fork tributaries in 1983 are summarized in Appendix B. A total of 2,000 brook trout were measured, ranging in length from a 21 mm fry sampled from Snow Creek to a 311 mm fish shocked in Buffalo River. Brook trout of 400+ mm were observed while snorkeling in lower Warm River and in lower Robinson Creek. Mean lengths of brook trout ranged from 80 mm in the headwaters of Warm River to 196 mm in Warm River below Warm River campground. Condition factors ranged from 1.22 in Fish Creek to 1.67 in Rock Creek.

Table 1. Distribution and relative abundance[1] of fish species collected by shocking or observed by snorkeling in Robinson Creek and tributaries, 1983.

Stream - transect	Location T	R	Section	Stream order	Species[2] BRK	WRB	HBB	HYB	CTT	BRN	MWF	MSC	USU	MSU	LND	SPD	RSS
Robinson Cr.																	
Above Falls YNP	10N	45E	1	2					A								
Below Falls YNP	10N	45E	24	2	C				C			C					
End Rd 470	9N	45E	5	3	C	A				C							
Canyon Pool and Run	9N	44E	17	4	C	A				C	A		A				
Three Rivers Ranch	9N	44E	13	4	C	C				C	A		A				
Little Robinson Cr.																	
Above junction w/ Robinson Cr. YNP	10N	45E	23	2	A				C			C					
Snow Cr.																	
Headwaters	11N	45E	34	1	A												
Upstream from Rd 527	10N	45E	9	2	A												
Above Snow Cr. Road culvert	10N	45E	31	2	A				R			C					
Below Snow Cr. Road culvert	10N	45E	31	2	C							A					
Rock Cr.																	
Upstream from last crossing of Cave Falls Rd.	9N	45E	11	2	A							C					
End of Rd 247	9N	45E	16	3	A				R			C			C		
Below Rd 490	9N	44E	24	3	A	R		R	R		C	C			C		
Wyoming Cr.																	
Upstream from Rd 124	9N	46E	18	2					R	A		C					
Downstream from Rd 124	9N	46E	18	2						A		C					
End of Rd 573	9N	45E	13	2								C					
End of Rd 576	9N	45E	14	2					C	C		C					
Beaver Cr.																	
Upstream from Cave Falls Rd	9N	45E	10	1	A							C					

Table 1. Continued.

Stream - transect	Location T	R	Section	Stream order	Species[2] BRK	WRB	HRB	HYB	CTT	BRN	MWF	MSC	USU	MSU	LND	SPD	RSS
Spring Cr.																	
End of Rd 490	9N	44E	13	1	C										A		
Porcupine Cr.																	
In Howell Ranch	9N	44E	25	2	A					R		C		C	C		
Parallel to Cave Falls Rd	9N	44E	24	2	A							C		C	C	A	
Guard Station GAWS	9N	44E	23	2	A	R		R		R		C		C	C		C
Rising Cr.																	
Along Cave Falls Rd	9N	44E	24	1	C					C		C					
Fish Cr.																	
North Fork GAWS	10N	44E	35	1	A												
Near Stephens Fish Cr. Ranch	9N	44E	8	2	A				R					C			

[1] Relative Abundance - Rare (R), Common (C), Abundant (A).

[2] Species Abbreviations - Brook Trout (BRK), Wild Rainbow (WRB), Hatchery Rainbow (HRB), Rainbow - Cutthroat Hybrids (HYB), Cutthroat (CTT), Brown Trout (BRN), Mountain Whitefish (MWF), Mottled Sculpin (MSC), Utah Sucker (USU), Mountain Sucker (MSU), Longnose Dace (LND), Speckled Dace (SPD), Redside Shiner (RSS).

Table 2. Distribution and relative abundance[1] of fish species collected by shocking or observed by snorkeling in Warm River and tributaries, 1983.

Stream - transect	Location T	R	Section	Stream order[3]	Species[2] BRK	WRB	HRB	HYB	CTT	BRN	MWF	MSC	USU	MSU	LND	SPD	RSS
Warm River																	
Headwaters below Scout Camp	11N	44E	20	1	C							C					
Above junction with Partridge Cr.	11N	44E	19	1	A	C	R			R		C					
Pole Bridge Campground GAWS	11N	44E	20	2	C	A	A					C					
1 km below Pole Bridge Campground	11N	44E	29	2	C	C					C	C					
GAWS above Warm R.	10N	44E	10	2	C	C	C			C	C	C					
Springs Snarkel transect above Cascade	10N	44E	21	2	C	A		R		R	A		A				
Snorkel transect below Cascade	10N	44E	21	2	C	A				R	A		A				
Warm R. Campground	9N	44E	8	2	C	A	A			A	A	C	A				
Partridge Cr.																	
End of Rd 499	11N	44E	2	2	A												
Junction w/Warm R.	11N	44E	20	2	A						C						
Moose Draw																	
Junction w/Warm R.	10N	44E	10	1	C	C	C			R		C					

1 Relative Abundance - Rare (R), Common (C), Abundent (A).

2 Species Abbreviations - Brook Trout (BRK), Wild Rainbow (WRB), Hatchery Rainbow (HRB), Rainbow - Cutthroat Hybrids (HYB), Cutthroat (CTT), Brown Trout (BRN), Mountain Whitefish (MWF), Mottled Sculpin (MSC), Utah Sucker (USU), Mountain Sucker (MSU), Longnose Dace (LND), Speckled Dace (SPD), Redside Shiner (RSS).

3 Several large springs add volume to Warm River without increasing stream order.

Table 3. Distribution and relative abundance[1] of fish species collected by shocking or observed by snorkeling in Falls River and tributaries, 1983.

Stream - transect	Location T	R	Section	Stream order	Species[2] BRK	WRB	HRB	HYB	CTT	BRN	MWF	MSC	USU	MSU	LND	SPD	RSS
Falls River																	
Angling above Sheep Falls	9N	45E	25	5		A											
Snorkeling at Marysville Diversion	9N	44E	35	5		A					A						A
Snorkeling at Kirkham Bridge	9N	43E	35	5		A					A		A				
Boone Cr.																	
Near Wyoming border below Indian Lake	9N	46E	29	3	R	R			R			C		C	A	C	
GAWS Station at Rd 042	9N	45E	35	3		R			R			C		C	C		
Conant Cr.																	
GAWS Station near Buggy Springs	8N	45E	23	3	C	C		R	R		C	C		C	C		
Campsite below Buggy Springs	8N	45E	22	3	C	C					C	C		C	C	C	
Below Rd 263	8N	45E	21	3	C	C		R			C						
At Henry Meadows Rd. Crossing	8N	44E	28	3	C	C					C	C		C	C	A	
Squirrel Cr.																	
At end of Rd 580	8N	46E	5	3	A				C			C		C	C	C	C
Downstream from Bergman Ditch Diversion	8N	45E	4	3			R	R				C		C	C	C	
Downstream from Crossing of Rd 263	8N	45E	5	3			R					C		C	C	A	A
Downstream from Squirrel Rd	8N	44E	18	3	A						C	C		C	C	C	C

1 Relative Abundance - Rare (R), Common (C), Abundant (A).

2 Species Abbreviations - Brook Trout (BRK), Wild Rainbow (WRB), Hatchery Rainbow (HRB), Rainbow - Cutthroat Hybrids (HYB), Cutthroat (CTT), Brown Trout (BRN), Mountain Whitefish (MWF), Mottled Sculpin (MSC), Utah Sucker (USU), Mountain Sucker (MSU), Longnose Dace (LND), Speckled Dace (SPD), Redside Shiner (RSS).

Table 4. Distribution and relative abundance[1] of fish species collected by shocking or observed by snorkeling in Buffalo River and tributaries, 1983.

Stream – transect	Location T	R	Section	Stream order	Species[2] BRK	WRB	HRB	HYB	CTT	BRN	MWF	MSC	USU	MSU	LND	SPD	RSS
Buffalo River																	
T13N, R44E Section 20	13N	44E	20	2	A	A											
Above Buffalo Campground	13N	44E	26	3	A											A	
Below US 20 Bridge by Pond's Lodge	13N	44E	27	3	C	C	C										
Chick Cr.																	
Upstream from Rd 291	13N	44E	21	2	C	C							C				

1 Relative Abundance – Rare (R), Common (C), Abundant (A).

2 Species Abbreviations – Brook Trout (BRK), Wild Rainbow (WRB), Hatchery Rainbow (HRB), Rainbow – Cutthroat Hybrids (HYB), Cutthroat (CTT), Brown Trout (BRN), Mountain Whitefish (MWF), Mottled Sculpin (MSC), Utah Sucker (USU), Mountain Sucker (MSU), Longnose Dace (LND), Speckled Dace (SPD), Redside Shiner (RSS).

We sampled 378 wild rainbow trout ranging in length from 45 mm (Buffalo River) to 362 mm (Conant Creek) with mean lengths ranging from 91 mm (Moose Draw) to 244 mm (Warm River). Condition factors ranged from 1.15 in Porcupine Creek to 1.76 in Moose Draw. Individual hatchery rainbow trout (46 sampled) ranged in total length from 172 mm (Moose Draw) to 254 mm (Warm River), and mean lengths ranged from 189 mm (Moose Draw) to 244 mm (Warm River above Partridge Creek). Condition factors of hatchery rainbow ranged from 0.94 in Squirrel Creek to 1.25 in Warm River above Partridge Creek and were generally lower than those of wild rainbow.

Cutthroat trout (47 collected in 1983) ranged from 72 mm (Fish Creek) to 315 mm (Boone Creek), but larger specimens were caught by angling in Boone Creek and observed while shocking in Robinson Creek above the impassable falls in Yellowstone National Park. Mean lengths of cutthroat ranged from 80 mm in Squirrel Creek to 238 mm in Wyoming Creek, and condition factors ranged from 1.09 (Conant Creek) to 1.59 (Squirrel Creek).

Brown trout (97 fish collected) ranged from 52 mm (Warm River) to 338 mm (Porcupine Creek) in total length, and mean lengths ranged from 71 mm (Moose Draw) to 289 mm (Porcupine Creek) (Appendix B). Condition factors ranged from 1.23 (Warm River) to 1.95 (Porcupine Creek).

Species Composition

Brook trout generally comprised the greatest proportion of the salmonid populations in the transects sampled by snorkeling and electrofishing in 1983 (Tables 5-8, Appendices C & D). Headwater tributaries often contained only brook trout or brook trout and sculpins. Rainbow trout were only common in the lower canyon section of Robinson Creek (Table 5, Appendix C), but were common in most areas of the Warm River (Table 6, Appendix C), Falls River (Table 7) and Buffalo River (Table 8) drainages.

Cutthroat trout are the native species in all drainages, but were the dominant species only in Robinson Creek in Yellowstone National Park (Table 5). Rainbow-cutthroat hybrids were observed in most waters where rainbow and cutthroat occurred sympatrically. Brown trout were the dominant species in Wyoming Creek and were quite common in Warm River and Robinson Creek.

Salmonid Abundance

Densities of age I+ and older trout in Robinson Creek and tributaries ranged from 24 fish/km in Snow Creek to 1,416 fish/km in a deep pool of a canyon reach on lower Robinson Creek (Table 5). Population densities generally ranged from 200 to 500 fish/km. Fry (less than 100 mm) were

Table 5. Summary of population estimates and species composition of age I+ and older trout in Robinson Creek and tributaries, 1983. Numbers in parentheses represent values for young of the year.

Stream – transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Robinson Cr.											
Above Falls YNP	7/27	500	1 Pass	8 (0)	–	–	–	–	–	100% CTT	High conductivity due to thermal spgs. reduced shocker efficiency.
2 km above Little Robinson Cr. YNP	7/27	113	1 Pass	2 (0)	–	–	–	–	–	100% CTT	"
1 km above Little Robinson Cr. YNP	7/27	104	1 Pass	3 (0)	–	–	–	–		100% CTT	"
End Rd 470	9/14	190 x 6	Snorkel Count	See Appendix C			49±7	255	425	57% BRN, 32%WRB,11%BRK	
Canyon – Run	9/14	63 x 14	"	"	"	"	47±9	746	534	57%WRB, 22%BRK,21%BRN	Whitefish & suckers abundant.
Canyon – Pool	9/14	60 X 15	"	"	"	"	85±29	1416	944	80%WRB, 13%BRK,7%BRN	"
Three Rivers Ranch	10/6	165 x 20	"	"	"	"	41±24	248	126	50%WRB,25%BRK 25%BRN	"
Little Robinson Cr.											
Above junction w/ Robinson Cr. YNP	7/27	186	2 Pass	25 (22)	7 (10)	–	35±6 (40±14)	188 (215)		82%BRK, 18%CTT	I+ older <77 mm 0+ <62 mm
Snow Cr.											
Headwaters	6/22	230 x 1.5	2 Pass	15 (1)	5 (0)	–	23±7	100	667	100%BRK	I+ >65 mm
Upstream from Rd 527	6/22	210 x 2	2 Pass	13 (3)	7 (0)	–	28±22 (5±2)	133	667	100%BRK	I+ >60 mm
Above Snow Cr. Rd Culvert	6/22	265	1 Pass	12 (0)	–	–	–	–	–	92%BRK,8%CTT	
Below Snow Cr. Rd Culvert	6/22	200	1 Pass	4 (0)	–	–	–	–	–	100%BRK	

Table 5. Continued.

Stream – transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Rock Cr.											
Upstream from last crossing of Cave Falls Rd	7/8	150	3 Pass	16	22	3	50±16	333	–	100%BRK	No young-of-the-year collected
End Rd 247				28	14	7					I+ older >80 mm
	7/15	109 x 9	3 Pass	(0)	(2)	(3)	54±8	495	550	98%BRK,2%CTT	0+ <59 mm
Below Rd 490	7/12-14	650 x 9	Schnabel	See Appendix D			851±160	1309	2042	99%BRK,1%WRB, <1%HYB,<1%CTT	
Wyoming Cr.											
Upstream from Rd 124	7/8	185	2 pass	15	2	–	17±3	92		93%BRN,7%CTT	
Downstream from Rd 124	7/12	325	2 Pass	11	4	–	17±7	52		93%BRN,7%CTT	
End of Rd 573	7/6	115	1 Pass	1	–	–	–	–	–	100%CTT	
End of Rd 576	7/13	175	2 Pass	8	3	–	13±7	74	–	28%BRN,72%CTT	
Beaver Cr.											
Upstream from Cave Falls Rd	7/8	115	3 Pass	13 (12)	17 (6)	4 (0)	35±4 (Not dipped after 1st run)	304	–	100%BRK	1st run shocker battery low, 2nd & 3rd runs generator shocker.
Spring Cr.											
				14	1		15±2	195			I+ >90 mm
End of Rd 490	6/29	77	2 Pass	(4)	(0)	–	(4±2)	(52)		100%BRK	0+ <72 mm

Table 5. Continued.

Stream – transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Porcupine Cr.											
				59	19		87±10	316		99%BRK,	I+ >115 mm
In Howell Ranch	6/29	275	2 Pass	(5)	(1)	–	(6±3)	(22)		1%BRN	0+ <63 mm
Parallel to				23	7		33±7	264	754	100%BRK	I+ >92 mm
Cave Falls Rd	6/28	125 x 3.5	2 Pass	(10)	(7)	–					0+<70 mm
Guard Station				61	26		106±17	278		95%BRK,2%WRB	I+>91 mm
GAWS	6/30	380	2 Pass	(8)	(4)	–	(16±14)	(42)		2%BRN,1%HYB	0+<79 mm
Rising Cr.											
				14	3		18±3	144	1440		
Along Cave Falls Rd	6/28	125 x 1	2 Pass	(4)	(0)	–	(4±2)	(32)	(320)		
Fish Cr.											
				47	27	15	106±19	683	3419	100%BRK	I+ >65 mm
North Fork GAWS	6/22	155 x 2	3 Pass	(2)	(1)	(1)	(4±2)	(26)	839		0+ <63 mm
Near Stephens											
Fish Cr. Ranch	6/23	330 x 4	3 Pass	47	38	19	142±41	426	1076	98%BRK,2%CTT	All trout >92 mm

1 For transects estimated by mark-recapture C_1=M, C_2=C, C_3=R.

2 Data for snorkel transect estimates are given in Appendix B.

3 Data for the Schnabel population estimate in Rock Creek below Rd 490 are given in Appendix D.

Table 6. Summary of population estimates and species composition of age I+ and older trout in Warm River and tributaries, 1983. Numbers in parentheses represent values for young-of-the-year.

Stream - transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Warm River											
Headwaters below				10	10	0	21±3	191			I+ >71 mm
Scout Camp	8/4	110	3 Pass	(13)	(7)	(5)	(29±10)	(264)	-	100%BRK	0+ <61 mm
Above junction			Mark-re-	72	71	22				93%BRK,4%WRB,	I+ >92 mm
w/Partridge Cr.	7/26-28	250	capture	(11)	(4)	(0)	232±77	928	-	2%HRB,1%BRN	0+ <72 mm
Pole Bridge Campground				43	23	11	88±12	392	605	48%BRK,3%HRB,	I+ >103 mm
GAWS	7/26	224 x 6.5	3 Pass	(4)	(0)	(0)	(4±1)	(18)	(27)	36%WRB,12%BRN	0+ <69 mm
1 km downstream from			Mark re-	14	24	3	52±29	304			I+ >120 mm
Pole Bridge Campground	8/29-31	171	capture	(11)	(17)	(5)	(69±38)	(404)		98%BRK,2%WRB	0+ <92 mm
GAWS above Warm			Mark re-	44	96	17				48%BRK,3%HRB,	Estimate of 0+ not
River Springs	7/27-29	620 x 10	capture	(10)	(3)	(0)	248±101	400	400	36%WRB,12%BRN	possible-no recaptures.
Snorkel Transect			Snorkel							98%WRB,1%BRK,	Whitefish
above Cascade	8/3/82	155 x 15	Count	See Appendix C			251	1619	1058	<1%BRN	estimate 57.
			Snorkel								Whitefish
	3/21	155 x 15	Count	See Appendix C			148	955	624	96%WRB,4%BRK	estimate 41.
			Snorkel							97%WRB,	
	8/31	119 x 15	Count	See Appendix C			223	1866	1163	3%BRK,4%BRN	Whitefish abundant.
Snorkel transect			Snorkel								Whitefish estimate
below Cascade	8/30	81 x 22	Count	See Appendix C			27	380	161	100%WRB	247, Sucker estimate 89.
		1500 m	Boat							63%WRB,32%BRN	One run only.
Warm R. Campground	6/20	(Approximately)	Shocker	110	-	-	-	-	-	3%BRK,3%HRB	
Partridge Cr.											
				58	30	14	115±13	958			I+ >72 mm
End of Rd 499	8/16	120	3 Pass	(6)	(3)	(1)	(10±2)	(83)	-	100%BRK	0+ <59 mm
				31	8	-	42±6	157	-		I+ >89 mm
Junction with Warm R.	8/4	268	2 Pass	(34)	(14)	-	(58±13)	(216)	-	100%BRK	0+ <70 mm
Moose Draw											
				12	0	-	12±2	120	-	51%WRB,5%BRN,	
Junction with Warm R.	8/31	100	2 Pass	(21)	(6)	-	(29±6)	(290)	-	16%BRK,8%HRB	0+ <92 mm

[1] For transects estimated by mark-recapture C_1=M, C_2=C, C_3=R.

Table 7. Summary of population estimates and species composition of age I+ and older trout in Falls River tributaries, 1983. Numbers in parentheses represent values for young-of-the-year.

Stream – transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Boone Cr.											
Near Wyoming border below Indian Lake	8/8	250	1 Pass	1	–	–	–	–	–	100%BRK	2 CTT caught by angling prior to shocking.
	9/12	250	Snorkel Count	See Appendix C 1			–	–		100%WRB	
GAWS Station Rd 042	8/17	200	1 Pass	2	–	–	–	–	–	50%CTT,50%WRB	Trout avoided capture in deep pools.
Conant Cr.											
GAWS Station near Buggy Springs	8/5-11	590 x 9	Mark-Re-capture	42	42	10	168±82	285	431	59%BRK,4%HYB, 36%WRB,1%CTT	0+ not dipped quantatively; juvenile whitefish present.
Campsite below Buggy Springs	8/10-11	170	Mark-Re-capture	10	27	4	77±55	453	–	54%BRK,46%WRB	
Below Rd 263	8/5	200	1 Pass	4	–	–	–	–	–	50%WRB, 25%BRK,25%HRB	Shocker efficiency low due to deep pools; 8 whitefish captured.
At Henry Meadows Road Crossing	8/19	160	3 Pass	9	6	1	16±2	100	–	60%WRB,40%BRK	0+ not dipped quantatively; juvenile whitefish present.
Squirrel Cr.											
At end of Rd 580	8/12	144	2 Pass	38 (8)	12 (5)	–	56±8 21±31	389 146	–	77%BRK, 23%CTT	YOY cutthroat present, I+ >96 mm, 0+ <72 mm.

Table 7. Continued.

Stream - transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Squirrel Cr. Con't											
Downstream from Bergman Ditch Diversion	8/18	200	1 Pass	2	-	-	-	-	-	50%HRB,50%CTT	
Downstream from Rd 263	8/12	150	1 Pass	2	-	-	-	-	-	100%HRB	Shocker efficiency low due to deep beaver ponds.
Downstream from Squirrel Rd	8/18-19	250	Mark-Re-capture	73[2] (3)	-	-	-	-	-	100%BRK	Estimate not possible due to mortality of marked fish.

1 For transects estimated by mark-recapture C_1=M, C_2=C, C_3=R.

2 Represents total catch of new fish for both days.

Table 8. Summary of population estimates and species composition of age I+ and older trout in Buffalo River and tributaries, 1983. Numbers in parentheses represent values for young-of-the-year.

Stream - transect	Date	Transect Length x Width (M)	Method	Trout captured[1] C_1	C_2	C_3	Population estimate Transect	#/km	#/ha	Species composition	Remarks
Buffalo River											
T13N R44E Section 20	9/2-13	125	Mark-Re-capture	59 (53)	45 (43)	13 0	197±101 -	1577 -	- -	61%BRK, 39%WRB	Estimate for 0+ not possible - no receptures.
Above Buffalo Campground	9/1	335 x 39	Snorkel Count	See Appendix C			1694	5057	1850	100%BRK	Large schools in deep pools.
Below US 20 Bridge by Pond's Lodge	9/1	265 x 50	Snorkel Count	See Appendix C			160	604	121	75%RB,25%BRK	
Chick Cr.											
Upstream from Rd 291	9/1	75	2 Pass	11 (13)	2 (3)	- -	13±2 17±3	180 (230)	- -	66%BRK, 34%WRB	0+ <100

[1] For transects estimated by mark-recapture C_1=M, C_2=C, C_3+R.

generally quite abundant, but were not quantified. Moderate numbers of whitefish were observed in the Three Rivers Ranch and canyon areas of Robinson Creek.

Trout densities in Warm River and tributaries ranged from 120/km in Moose Draw to 1,866/km above the cascade (Table 6). Additionally, whitefish densities of 3,479 fish/km were found in Warm River below the cascade and 326 fish/km in Warm River above the cascade. The brook trout population in Partridge Creek at the end of Road 499 (958 fish/km) was very dense, as the average width of the stream is less than 5 m. Many adult fish had lesions on the backs and fin erosion, indicating some type of disease was present in that population. Brown trout were collected in Warm River above Partridge Creek, and brown trout fry were collected in Moose Draw, indicating natural reproduction may have occurred in upper Warm River. Brown trout from the 1982 fingerling plant were abundant in Warm River near the old fish hatchery (Warm River Springs), while browns from the 1980-82 plants were collected in the lower end of Warm River near Warm River campground.

Trout densities in Falls River tributaries ranged from a low of one fish in a 365 m section of Boone Creek near Indian Lake (3 fish/km) to 453 trout/km in Conant Creek (Table 7). Brook trout were generally the most abundant species, but rainbow trout were larger. Native cutthroat trout were present in moderate numbers (61 fish/km) in Squirrel Creek.

Trout densities in Buffalo River and tributaries ranged from 180 fish/km in Chick Creek to 5,057 fish/km in Buffalo River above Elk Creek (Table 8). Brook and rainbow trout were abundant, and in upstream areas, fry were very abundant. The dense concentration of brook trout in Buffalo River above Elk Creek contained individuals up to 350 mm (estimated by snorkeling).

Tag Returns and Fish Movement

Only 11 of the 459 tags (2.3%) placed on trout in Henrys Fork tributaries were returned by anglers in 1983. Four of the returns contained insufficient information to assess movements of fish from the location of tagging (Table 9). The returns containing specific information on the location of capture showed only one fish moving any significant distance from the location of tagging. It was a 292 mm brook trout caught the day after it was tagged in Conant Creek and had moved downstream approximately 6.3 km from Henry Meadows to the junction of Squirrel and Conant creeks.

Table 9. Summary of tagging and recapture data for returned tags from fish tagged in Henrys Fork tributaries, 1983.

		Tagging data			Recapture data			
Tag number	Species	Date	Location	Length	Date	Location	Length	Movement
B0205	HYB	6/20	Warm River Campground	250	7/16	Warm River Campground	270	None
B0203	WRB	6/20	Warm River Campground	321	6/26	Warm River	330	Insufficient report
B0207	WRB	6/20	Warm River Campground	240	8/6	Warm River Campground	330	None
A0017	BRK	6/23	Fish Creek-Stephens Fish Creek Ranch	179	8/19	Fish Creek	254	Insufficient report
B15718	BRK	7/14	Rock Creek below Rd 490	202	8/17	Rock Cr. below Rd 490	209	None
A0091	BRK	7/14	Rock Creek below Rd 490	217	8/17	Rock Cr. below Rd 490	216	None
A0287	WRB	7/26	Warm River at Pole Bridge	211	8/12	Not reported	203	Insufficient report
A0280	HRB	7/26	Warm River at Pole Bridge	215	8/10	Warm River at Pole Bridge	Not Reported	None
K10220	WRB	7/26	Warm River at Pole Bridge	242	8/27	Warm River at Pole Bridge	254	None
K10235	WRB	7/29	Warm River at Springs	247	9/5	Spring Cr. (Warm River?)	254	Insufficient report
X603	BRK	8/19	Conant Creek at Henry Meadows	292	8/20	Junction Squirrel and Conant creeks	Not Reported	Downstream 6.4 km

Age and Growth

Body-Scale Regressions

Annuli were generally quite distinct, and aging by scales was a rapid and efficient method for all populations. However, the relationships between total lengths and scale sizes were generally not consistent between populations, and body-scale regressions generally had poor fits. The best fits for body-scale regressions were for brook trout (r^2 values 0.48 to 0.97), but intercepts varied from -21 mm to 70 mm (Appendix E). Those regressions with best fits (r^2 >0.8) usually had intercepts near zero, so zero was chosen as the correction factor for back-calculating brook trout length at annuli. The body-scale regressions for rainbow, hybrid, cutthroat, and brown trout generally had poor fits and very inconsistent intercept values because of small sample size. Literature values (Carlander 1969) were used for correction factors.

Back-Calculated Lengths

Weighted mean back-calculated lengths (all age classes combined) for brook trout are summarized in Table 10. The oldest brook trout of 471 fish aged was one age IV+ individual sampled from Rock Creek below Road 490. For all Henrys Fork tributaries combined, back-calculated lengths of brook trout ranged from 61 to 116 mm at annulus I, from 106-179 mm at annulus II, from 146-256 mm at annulus III, and the IV+ fish were 248 mm at annulus IV. Growth was slowest in cold, spring-fed headwaters of Snow Creek and Warm River and best in Falls River tributaries and Buffalo River.

The oldest wild rainbow trout sampled was a five-year-old fish from Warm River (Table 11). Wild rainbow lengths ranged from 92 to 117 mm at annulus I, from 127 to 194 mm at annulus II, from 203-253 mm at annulus III, from 213 to 313 mm at annulus IV, and 315 mm at annulus V.

Cutthroat trout ranged from 65 to 138 mm at annulus I, from 129 to 202 mm at annulus II, and from 203 to 288 mm at annulus III (Table 12). Hybrids ranged from 89 to 140 mm at annulus I, from 147 to 228 mm at annulus II, and one age III+ hybrid sampled from Warm River was estimated to be 269 mm at annulus III (Table 13).

Most brown trout sampled were age I+ and were apparently from 1982 fry plants, as many scales showed planting checks and some fish had deformed fins. Growth of brown trout was good, with lengths at annulus I ranging from 77 to 173 mm (Table 14). Two age II+ browns sampled from Porcupine Creek averaged 239 mm at annulus II.

We took scales from mountain whitefish sampled from Rock Creek and Conant Creek. Lengths at annulus I ranged from 69 to 99 mm, from 141 to 175 mm at annulus II, from 212 to 215 mm at annulus III, and 244 mm at annulus IV (Table 15).

Table 10. Weighted mean back-calculated lengths at annuli of brook trout collected from Henrys Fork tributaries in 1983.

System	Stream	Transect	N	$\bar{L}$ (mm)	Weighted mean back-calculated length (mm) at annulus: I	II	III	IV
	Little Robinson Creek	Above Junc. w/Robinson Cr. YNP	21	133	84	141	209	
	Snow Creek	Headwaters	20	105	61	106	141	
		Upstream from Rd 527	19	96	70	114	116	
		Above Snow Cr. Road Culvert	15	111	82	146		
Robinson	Rock Creek	Upstream from Last Crossing of Cave Falls Rd	23	140	78	130	166	
Creek		End Rd 247	31	146	92	156		
		Below Rd 490	35	173	95	161	212	248
	Beaver Creek	Upstream from Cave Falls Rd	25	132	83	150		
	Porcupine Creek	In Howell Ranch	16	183	102	161	232	
		Guard Station GAWS	17	148	97	156		
	Rising Creek	Along Cave Falls Road	9	118	76	171	210	
	Fish Creek	North Fork GAWS	31	114	74	122	161	
		Near Stephens Fish Cr. Ranch	38	155	85	147	176	
	Warm River	Headwaters below Scout Camp	12	91	68	128	170	
		Above Junction with Partridge Creek	12	165	92	158	207	
Warm		Pole Bridge Campground GAWS	19	131	95			
River		GAWS Above Warm R. Springs	13	130	99	170		
	Partridge Creek	End of Rd 499	37	150	76	138	199	
		Junction with Warm R.	10	134	72	140	168	
	Moose Creek	At Junction with Warm R.	4	139	106	164	234	
	Boone Creek	Near Wyoming border below Indian L.	1	144	82			
Falls River	Conant Creek	GAWS Station near Buggy Springs	15	199	103	176	246	
		At Henry Meadows Road Crossing	6	199	116	179		
	Squirrel Creek	Downstream from Squirrel Rd	19	141	97	162	217	
Buffalo	Buffalo River	T13N R44E Section 20	13	171	113	160	256	
River	Chick Creek	Upstream from Rd 291	10	111	79	135		

Table 11. Weighted mean back-calculated lengths at annuli of wild rainbow trout sampled from Henrys Fork Tributaries in 1983.

System	Stream	Transect	N	$\bar{L}$ (mm)	Weighted mean back-calculated length (mm) at annulus: I	II	III	IV	V
Robinson Creek	Rock Creek	Below Rd 490	4	224	98	162	224		
	Porcupine Creek	Guard Station GAWS	2	155	108				
Warm River	Warm River	Above junction w/Partridge Creek	5	227	110	151	198	225	
		Pole Bridge Campground GAWS	12	222	113	164	203	213	
		GAWS Above Warm R. Springs	12	182	117	194	242	282	315
	Moose Draw	At junction with Warm R.	15	106	92	129			
Fall River	Conant Creek	GAWS Station near Buggy Springs	13	222	103	179	251	307	
		At Henry Meadows Road Crossing	8	244	105	187	253	313	
Buffalo River	Buffalo River	T13N R44E Section 20	11	150	113	168			
	Chick Creek	Upstream from Rd 291	6	101	87				

Table 12. Weighted mean back-calculated lengths at annuli of cutthroat trout sampled from Henrys Fork Tributaries in 1983.

System	Stream	Transect	N	$\bar{L}$ (mm)	Weighted mean back-calculated length (mm) at annulus: I	II	III
Robinson Creek	Robinson Creek	Above Falls YNP	14	183	108	165	203
	Robinson Creek	Below Falls YNP	5	162	107	167	205
	Little Robinson Creek	Above junction w/Robinson Cr. YNP	9	184	133	175	239
	Rock Creek	Below Rd 490	2	182	138	193	
	Wyoming Creek	Upstream from Rd 124	2	185	104	129	
		End of Rd 576	9	214	95	172	209
Fall River	Boone Creek	Near Wyoming border below Indian Lk.	1	315	128	202	288
	Conant Creek	GAWS Station near Buggy Springs	1	185	129	159	

Table 13. Weighted mean back-calculated lengths at annuli of rainbow-cutthroat hybrid trout sampled from Henrys Fork tributaries in 1983.

System	Stream	Transect	N	$\bar{L}$ (mm)	Weighted mean back-calculated length (mm) at annulus: I	II	III	IV
Robinson Creek	Rock Creek	Below Rd 490	1	215	114	190		
	Porcupine Creek	Guard Station GAWS	1	180	89	151		
Warm River	Warm River	Above Junction w/Partridge Creek	1	294	140	228	269	
Fall River	Conant Creek	GAWS Station near Buggy Springs	1	172	117	147		

Table 14. Weighted mean back-calculated lengths at annuli of brown trout sampled from Henrys Fork tributaries in 1983.

System	Stream	Transect	N	$\bar{L}$ (mm)	Weighted mean back-calculated length (mm) at annulus: I	II
Robinson Creek	Wyoming Creek	Above and below Rd 124	29	183	135	
		End Rd 576	3	204	164	
	Porcupine Creek	In Howell Ranch	1	118	77	
		Guard Station GAWS	2	288	173	239
	Rising Creek	Along Cave Falls Rd	6	137	107	
Warm River	Warm River	GAWS above Warm River Springs	9	127	110	

Table 15. Weighted mean back-calculated lengths at annuli of mountain whitefish sampled from Henrys Fork tributaries in 1983.

System	Stream	Transect	N	Weighted mean back-calculated length (mm) at annulus: $\bar{L}$ (mm)	I	II	III	IV
Robinson Creek	Rock Creek	Below Rd 490	2	260	99	175	215	244
Fall River	Conant Creek	GAWS Station near Buggy Springs	6	156	69	141	212	

Survival

Estimates of annual survival of trout in Henrys Fork tributaries were generally very low. Brook trout survival estimates (Appendix F) ranged from 6% survival from year to year in a heavily fished area near Pole Bridge campground on Warm River to 47% near Buggy Springs on Conant Creek. Annual survival estimates for wild rainbow trout ranged from 21% in Buffalo River to 36% in Conant Creek near Buggy Springs (Appendix G). We did not obtain sufficient samples of cutthroat or brown trout to calculate survival estimates, but age class breakdowns of our electrofishing samples are listed in Appendices H, I and J for these species.

Migration Barriers

Several natural and man-made migration barriers exist on the Henrys Fork and tributaries in the area studied in 1983 (Fig. 6). Natural barriers include impassable waterfalls and steep cascades. Waterfalls exist on the Henrys Fork (Sheep Falls, upper and lower Mesa Falls), on springs flowing into Warm River, on Robinson Creek in Yellowstone National Park, on Wyoming Creek, and on Falls River (Cave Falls and Sheep Falls). Steep cascades which may hinder fish passage exist on Warm River, Robinson Creek, Snow Creek, and Boone Creek.

Man-made barriers to fish passage include hydroelectric dams, irrigation dams, and culverts. Dams on the main Henrys Fork are Island Park Dam and Ashton Dam, and a hydroelectric dam near the mouth of Buffalo River prevents migration of fish from the Henrys Fork into the Buffalo River. Irrigation dams exist on the Henrys Fork just below the mouth of Falls River (Chester Dam), Falls River (three dams), and on Squirrel Creek (Bergman ditch diversion). An impassable culvert exists on Snow Creek at the crossing of Snow Creek Road.

Spawning Activity

Rainbow trout spawning activity in lower Warm River was concentrated in the section from the Highway 47 bridge to the old railroad crossing in Warm River campground (Table 16). Fish from 300 to 400 mm in length were observed. The density of redds in 1983 decreased substantially above the Warm River campground even though large amounts of suitable spawning habitat was available. In 1984, six redds with trout on them were observed in the section from the Highway 47 bridge downstream to the confluence of Robinson Creek, but turbulent water made total counts impossible.

Table 16. Redd counts on Warm River from the Highway 47 bridge upstream during March, 1983 and 1984.

Section	Date 3/24/83	3/22/84
Highway 47 bridge to Fish Cr. bridge	30	34
Fish Creek bridge to old R.R. crossing	17	45
R.R. crossing to campground bridge	present[1]	not checked
Campground bridge to cascade	present[1]	not checked

[1] Uncountable due to light conditions.

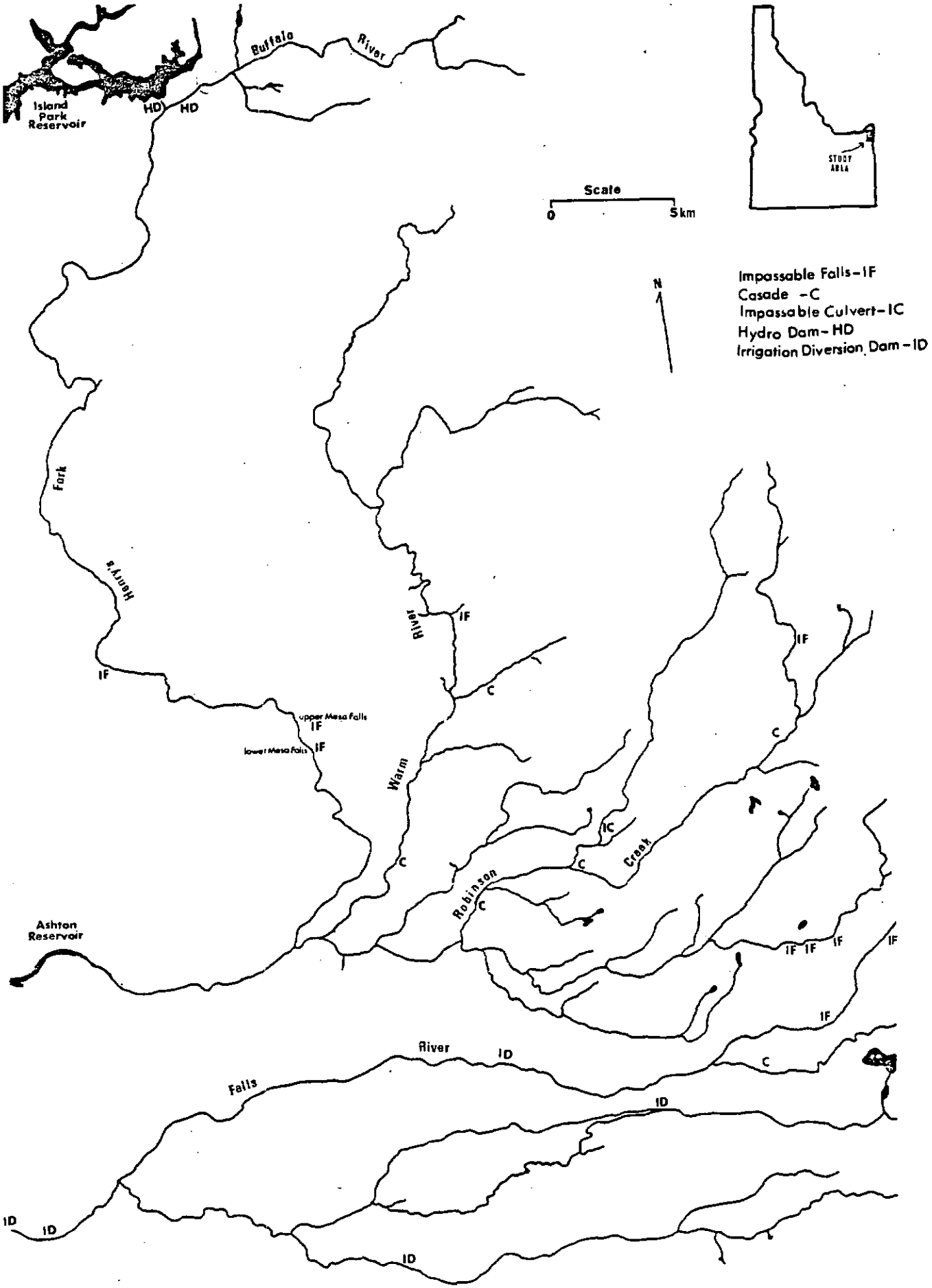


Figure 6. Natural and man-made barriers to fish migration in Henrys Fork and tributaries.

Rohrer (1984) conducted aerial redd counts of lower Warm River on April 11, 1983, and found 24 redds but noted that counting was difficult and not total. Counting was terminated above Warm River campground due to narrowing of the canyon (Bob Rohrer, pers. comm.).

DISCUSSION

Sampling Techniques

The backpack shocker was generally adequate for fish sampling in small- to medium-sized streams. Snorkeling was an efficient and accurate census technique in larger areas of Robinson Creek, Buffalo River, and Warm River, where steep canyon walls prevented boat access. The larger shocker mounted in a drift boat will work on lower Warm River from the Warm River campground to the fish observation area, but the portion from the fish observation area to the north is too dangerous to wade.

The main Falls River presented sampling difficulties, and we did not do any quantitative sampling in 1983. There are several rapids and irrigation dams, and access is limited due to steep canyons. We attempted snorkeling at two locations on Falls River on August 31, 1983, but visibility was too poor (<2 m) to obtain quantitative estimates of fish abundance. Numerous trout (200 to 250 mm) were seen, and young-of-the-year rainbow trout were very abundant. It would be possible to wade and shock in Falls River with a drift boat if put-in and take-out points could be located between rapids or dams.

Fish Species Distributions

Brook trout were ubiquitous in the waters sampled in 1983. They were present in all streams except above impassable falls on Robinson and Wyoming creeks. Brook trout were introduced to the upper Henrys Fork drainage in the late 1800's. They have not been stocked in Henrys Fork tributaries for many years, but populations have been maintained by natural reproduction.

Rainbow trout were found in all tributary drainages, mostly in larger streams (third order and larger). Catchable-size hatchery rainbow are stocked in Buffalo River, Warm River, Robinson Creek, Falls River, Conant Creek, and Squirrel Creek (IFG fish planting records). Natural reproduction by rainbow trout was evident in all waters where the species were found. Since rainbow trout are the primary species in the Henrys Fork, the relative contribution of tributary spawning will be assessed by tag returns and electrofishing in the main Henrys Fork in 1984 and 1985.

Cutthroat trout are the only native trout species in the upper Henrys Fork drainage (Simpson and Wallace 1978), but they were not found in the Warm River and Buffalo River systems and were greatly restricted in Robinson Creek and Falls River systems. Cutthroat were the only fish

species sampled from Robinson Creek above an impassable falls in Yellowstone National Park. The Robinson Creek cutthroat had a unique appearance in that spotting was greatly reduced, with a few large spots confined to the caudal peduncle. Body coloration was a bluish-green rather than olive-green that is typical for the Yellowstone Park cutthroat. Other cutthroat sampled from Henrys Fork tributaries appeared to be Snake River cutthroat (Salmo clarki bouvieri).

Rainbow-cutthroat hybrids occurred in Robinson Creek below the impassable falls and in several Robinson Creek tributaries; also in Boone, Squirrel, and Conant creeks and Warm River. Hybrids exhibited predominantly rainbow characteristics (small scales, numerous small spots, spots on head), but had slashes under their mandibles.

Brown trout in most waters were probably introduced as fry from Ashton Hatchery. Brown trout fry were distributed throughout the Warm River, Robinson Creek, and Henrys Fork drainages by Trout Unlimited volunteers in 1981 and 1982. The brown trout in Wyoming Creek were all age I+ fish, and some had fin erosion. Browns were first introduced in Robinson Creek in the early 1970's (Idaho Department of Fish and Game county fish planting records), and natural reproduction is probably successful.

Salmonid Abundance

Salmonid population densities were quite variable in Henrys Fork tributaries, ranging to very low (3 fish/km in Boone Creek near Indian Lake) to very high (>5,000/km in Buffalo River above Elk Creek). In contrast, Rohrer (1981, 1983) estimated trout populations (fish >180 mm) to be about 3,000/km in the Henrys Fork below Island Park Reservoir and below Ashton Reservoir. Several factors probably influence trout population densities in Henrys Fork tributaries:

1. Stream size - the amount of water and habitat available limits population size of trout >100 mm. Small streams often had low population densities.

2. Productivity - we did not do chemical analysis, but low conductivity was evident in many waters in the Warm River and Robinson Creek drainages. We had to use high voltage (600-700 V) to shock many streams. Low conductivity (limited productivity) probably affects trout growth as well as carrying capacity of many streams. Chemical analysis of water quality and conductivity measurements by Whitehead (1978) showed these observations to be valid.

3. Depth and cover - the highest densities of trout >100 mm were found in areas with deep pools. The snorkel transects in Warm River above and below the cascades and in the deep pool in Robinson Creek were >3 m deep and held high densities of trout, whitefish, and suckers. The snorkel transect on Buffalo River above Elk Creek (5,057 trout/km) had pools 1.5-2 m deep, and trout were congregated in the pools.

4. Spring flooding - Buffalo River and Warm River are primarily spring-fed systems that do not fluctuate greatly during runoff. The Robinson Creek drainage has several spring-fed streams, and fluctuation was moderate during the 1983 runoff season. Runoff from Falls River and tributaries was very heavy in 1983, and high water prevented us from sampling until late July. Boone, Squirrel, and Conant creeks showed evidence of severe flooding (bank cutting and debris jams). Trout densities in these streams (especially Boone Creek) were generally lower than in similar-sized streams in the other drainages. It is possible that trout densities are low due to these high flows during the 1983 runoff.

5. Angling - we did not do creel census in 1983, so estimates of angler effort and harvest are not available. We did observe evidence of angling at points with easy access, especially on Warm River. Population densities of trout larger than 100 mm were more than 2.5 times higher in Warm River above Partridge Creek (not near an access road) than at Pole Bridge campground, which was less than 5 km downstream (Table 6). Localized angling effort may reduce fish populations near access areas in Henrys Fork tributaries making stocking necessary. However, most of the drainages are relatively inaccessible, and fish populations are probably not overexploited.

6. Habitat degradation - habitat degradation does not appear to be a serious problem affecting the fisheries in the tributaries studied. There is extensive logging on the Targhee National Forest, but buffer strips, proper road construction, and flat terrain minimize sedimentation. Losses of fish to irrigation diversions on Falls River, Squirrel Creek, and Conant Creek are unquantified.

GAWS Transects

Aquatic habitat in four streams (five transects) were surveyed by Smith (1981, 1982) using the Forest Service General Aquatic Wildlife Survey (GAWS) and Region 1 (R-1) channel stability rating methods. We sampled fish populations at these locations to assess relationships between habitat parameters and fish abundance in Henrys Fork tributaries. The GAWS method involves measurements of channel width, water width, mean depth, and bottom cover. Pools are classified by percentage of the transect and by length and width, depth and shelter. The R-1 channel stability rating method classifies channel stability based on bank slope, channel obstructions, streambank vegetation, mass wasting, bank cutting, bottom composition, imbeddedness, and vegetative cover (low scores indicate high stability).

GAWS and R-1 stability data for Fish Creek, Rock Creek, Warm River (two transects), and Conant Creek are summarized in Table 17, with fish species composition, population densities, and standing crops. Habitat

Table 17. Summary of habitat data[1] and fish population data[2] for GAWS Stations surveyed by electrofishing in 1983.

	North Fork Fish Creek	Rock Creek below Rd 490	Warm River above springs	Warm River at Pole Bridge	Conant Creek near Buggy Springs
Mean channel width (m)	1.6	8.3	11.0	8.1	9.0
Mean water width (m)	1.5	6.4	10.0	6.5	6.6
Mean depth (cm)	17	21	26	31	18
Mean % pool	25	20	25	59	13
Mean pool rating	2.4	2.5	1.5	1.6	3
Bottom cover:					
% plants	5	0	0	1	0
% boulder	0	3	1	0	2
% rubble	0	79	15	55	27
% gravel	37	0	77	39	65
% sand/silt	53	18	7	4	9
R-1 channel stability rating	68	84	74	46	101
Species composition	100%BRK	98%BRK,1%WRB <1%HYB,<1%CTT	48%BRK,36%WRB, 12%BRN,3%HRB	48%BRK,29%HRB, 23%WRB	59%BRK,36%WRB 4%HYB,1%CTT
# fish/km	316±34	1309±320	400±163	364±13	285±35
# fish/hectare	2117±228	2045±500	400±163	546±20	431±211
Standing crop kg/hectare	70±8	128±31	25±10	40±2	48±24

1 Habitat data for Fish Creek and Conant Creek from Smith (1981), habitat data for Warm River and Rock Creek from Smith (1982).

2 Fish population and standing crop estimates for fish larger than 100 mm.

parameters and fish populations differed substantially between the transects. Correlation coefficients were computed for fish populations and biomass with all habitat parameters and R-1 channel stability ratings (Table 18). Fish abundance and biomass were not strongly correlated with width, depth, percent pool, mean pool ratings, R-1 channel stability ratings, percent plant cover or percent sand/silt bottom. Percent gravel cover was negatively correlated with standing crop ($r = -0.91$, $p<0.05$) and fish abundance ($r = -0.81$, NS). There were also strong (but not statistically significant) positive correlations of percent rubblecover and percent boulder cover with fish abundance and standing crops.

The observed relationships are complicated by several factors. The GAWS and R-1 surveys were made one or two years prior to the fish population surveys, and habitat characteristics may have changed. Hatchery rainbow trout comprised substantial proportions of the standing crops of the Warm River transects, and harvest is probably not comparable between stations. It would be necessary to conduct concurrent measurements of habitat parameters and estimates of fish populations at several stations to adequately assess the ability of GAWS and R-1 to predict trout abundance and standing crops. Also, production of wild trout biomass would standardize fish populations between transects inspite of stocking and angling harvest.

Age, Growth and Survival

Growth rates of trout in Henrys Fork tributaries were quite variable, but generally slower than those for fish from the Henrys Fork. Brook trout sampled from the Henrys Fork above Island Park Dam by Coon (1978a) had a mean back-calculated length at annulus I that was within the range of values calculated for fish from the tributaries. However, Henrys Fork brook trout were larger at annuli II and III than any of the tributary populations (Table 19). Rainbow trout from the Henrys Fork above Island Park Reservoir (Coon 1978b), in Box Canyon (Rohrer 1983), and below Warm River (Rohrer 1981) were consistently larger than wild rainbow from the tributaries at all annuli (Table 20).

The slow growth, relatively short longevity, and low survival of trout from Henrys Fork tributaries results in populations with small average size and few large individuals. Natural reproduction and recruitment appear to be adequate in all waters we surveyed in 1983. Utilization of fish populations which are composed of high densities of small fish could be increased by liberalizing the creel limit for brook trout. The brook trout bonus limit (10 brook trout in addition to the regular trout limit) in effect on Rock Creek has not resulted in overexploitation. Growth, mean size, survival, and population densities are comparable to or better than those in similar size tributaries (Warm River, Conant Creek, and Buffalo River) with the normal trout limit (six fish, no more than two over 405 mm) (Table 21). Extension of the bonus brook trout limit to all Henrys Fork tributaries would allow an increase in harvest opportunity to anglers of a relatively unexploited resource.

Table 18. Correlation matrix of habitat parameters measured at GAWS Stations to fish population abundance and to standing crop biomass.

Habitat parameter[1]	Fish population parameter: # fish/km — Correlation coefficient	# fish/km — Significance[2]	Standing crop (kg/hectare) — Correlation coefficient	Standing crop (kg/hectare) — Significance
Mean channel width (m)	0.16	NS	-0.28	NS
Mean water width (m)	0.10	NS	-0.36	NS
Mean depth (cm)	-0.07	NS	-0.42	NS
Mean % pool	-0.21	NS	-0.32	NS
Mean pool rating	0.17	NS	0.48	NS
Botton cover:				
% plants	-0.34	NS	0.04	NS
% boulder	0.744	NS	0.628	NS
% rubble	0.78	NS	0.60	NS
% gravel	-0.80	NS	-0.91	P<0.05
% sand/silt	-0.04	NS	0.34	NS
R-1 channel stability rating	0.20	NS	0.26	NS

1 Habitat data from Smith (1981, 1982).
2 Critical value of r at significance level of 0.05 r<-0.878 or >0.878.

Table 19. Comparison of range in back-calculated lengths at annuli of brook trout from Henrys Fork tributaries to mean back-calculated lengths at annuli from Henrys Fork above Island Park dam.

Location	Back-calculated length at annulus			
	I	II	III	IV
Robinson Creek and tributaries	61-102	106-161	141-232	248
Warm River and tributaries	68-106	128-170	168-232	
Falls River and tributaries	82-116	162-179	168-234	
Buffalo River and tributaries	79-113	135-160	256	
Henrys Fork above Island Park Res.[1]	88	183	300	

[1] Data from Coon [1978b].

Table 20. Comparison of range in back-calculated lengths at annuli of wild rainbow trout sampled from Henrys Fork tributaries to mean back-calculated lengths from three sections of the Henrys Fork.

Location	Back-calculated length at annulus					
	I	II	III	IV	V	VI
Robinson Creek and tributaries	98-108	162	224			
Warm River and tributaries	92-117	129-194	198-242	213-282	315	
Falls River and tributaries	103-105	179-187	251-253	307-313		
Buffalo River and tributaries	87-113	168				
Henrys Fork above Island Park Res.[1]	111	217	322	391	488	546
Henrys Fork, Box Canyon to Last Chance[2]	129	211	297	369	458	555
Henrys Fork below Warm River[3]	138	228	292	359	426	

1 Data from Coon (1978b).
2 Data from Rohrer (1983).
3 Data from Rohrer (1981).

Table 21. Comparison of brook trout populations, growth and condition in similar transects on Rock Creek, Warm River, Conant Creek and Buffalo River, 1983.

	Robinson Creek	Warm River	Falls River	Buffalo River
Stream	Rock Cr.	Warm R.	Conant Cr.	Buffalo R.
Transect	Along Rd 490	Above junc. w/Partridge Creek	Buggy Spgs.	T13N R44E Section 20
# fish/km	1309±320	928±308	285±139	1577±809
% brook trout	99	93	59	61
Mean length	157±6	140±6	155±18	121±8
Mean weight	63±8	46±10	137±30	107±24
Mean K	1.54	1.39	1.34	1.36
Length at annulus:				
I	95±6	92±8	103±9	113±10
II	161±10	158±22	176±9	160±25
III	212±15	207±8	246±10	256
IV	248			
Survival	0.36±0.04	0.21±0.06	0.35±0.12	0.13±0.09

Migration Barriers

Buffalo River Dam

The hydroelectric dam at the mouth of Buffalo River prevents upstream migration of fish from the Henrys Fork. Resident brook and rainbow trout are abundant, and population densities (away from major access areas) were among the highest observed in 1983. The Buffalo probably provides recruitment for the Henrys Fork from fish emigrating over the spillway of the hydrodam. The Buffalo has abundant spawning habitat along its entire length and could support a run of fish from the Henrys Fork. Large spawners could enhance the Buffalo River fishery (see letter in appendix of Rohrer 1983) if a fishway was constructed.

Warm River Cascades

Steep cascades exist on Warm River approximately 8 km upstream from the junction with the Henrys Fork. The cascades may hinder, but probably do not totally block, upstream migration of fish. We caught several rainbow-cutthroat hybrids above the cascades, which were probably migrants from Robinson Creek or the Henrys Fork, as we found no evidence of cutthroat in the Warm River drainage. Whitefish were also present above the cascade (at much lower densities than below the cascade), but we did not collect or observe whitefish in upper Warm River.

Falls River Irrigation Dams and Waterfalls

Three irrigation dams exist on Falls River, which are impassable to fish migration. The effects on these dams on fish migration and losses of fish to irrigation diversions need to be studied in 1984. Natural barriers also exist on Falls River at Sheep Falls and at Cave Falls.

Robinson Creek in Yellowstone Park

Impassable falls on Robinson Creek in Yellowstone National Park allow a population of cutthroat trout to remain isolated from hybridization with rainbow trout and from competition with brook and brown trout. The Robinson Creek cutthroat may represent a unique native strain that deserves further study.

Habitat Surveys

Pool habitat and spawning habitat on Robinson Creek, Warm River, Buffalo River, and Falls River tributaries in Targhee National Forest were surveyed by Rainville (1978). Pool habitat (cover for adult trout) and spawning habitat were subjectively classified as very good, good, fair, poor, or very poor, and maps were produced for each drainage. Maps of these surveys were reproduced and are included here for the Robinson Creek drainage (Fig. 7), Warm River drainage (Fig. 8), Falls River tributaries (Fig. 9), and Buffalo River drainage (Fig. 10).

Larger streams generally have good to very good pool and spawning habitat, and smaller streams generally have poor to fair pool habitat and fair to good spawning habitat. Poor spawning habitat exists on streams with extensive beaver activity, where continuous beaver dams do not provide adequate spawning gravel. None of the streams surveyed were classified as very poor habitat.

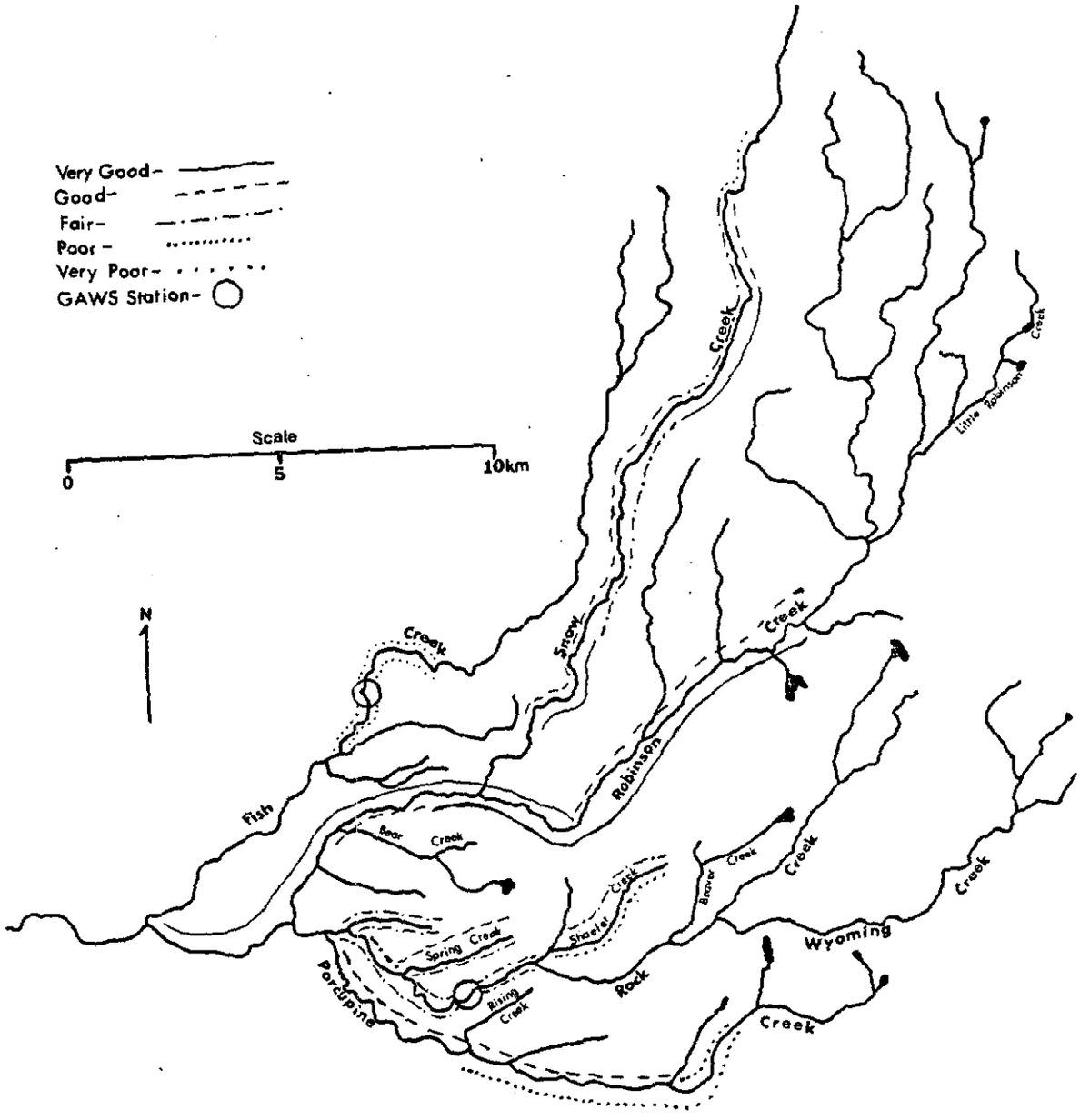


Figure 7. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Robinson Creek and tributaries in Targhee National Forest. Data from Rainville (1978).

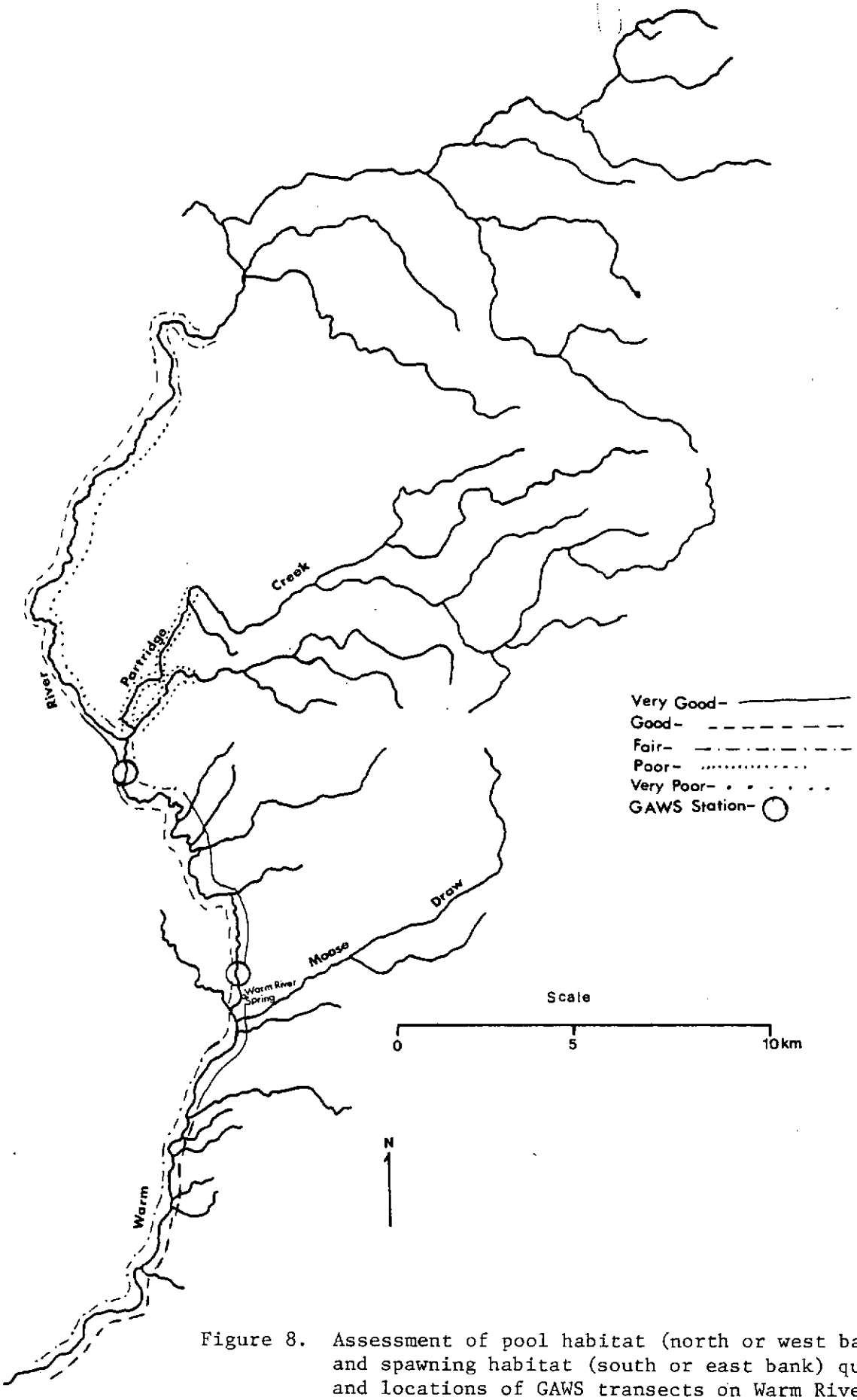


Figure 8. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Warm River and tributaries in Targhee National Forest. Data from Rainville (1978).

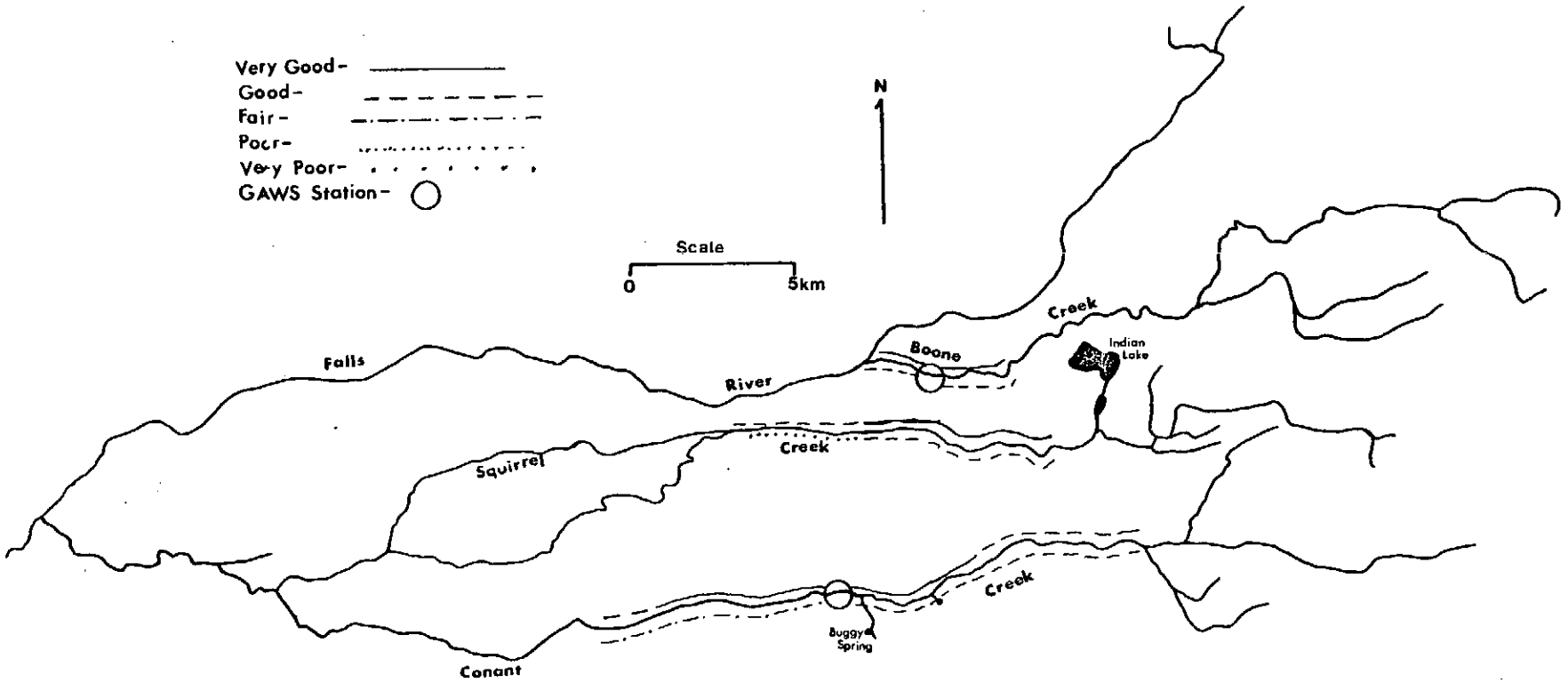


Figure 9. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Falls River tributaries in Targhee National Forest. Data from Rainville (1978).

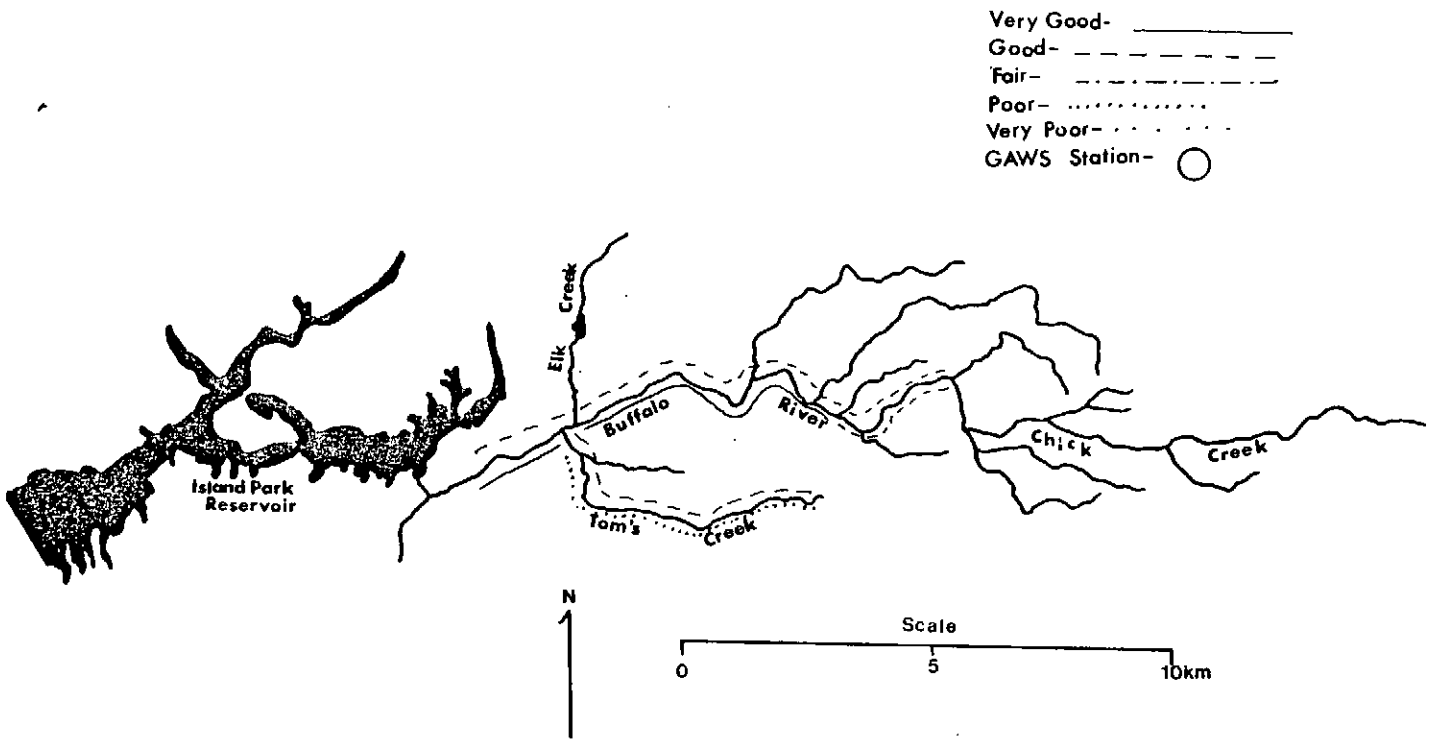


Figure 10. Assessment of pool habitat (north or west bank) and spawning habitat (south or east bank) quality and locations of GAWS transects on Buffalo River and tributaries in Targhee National Forest. Data from Rainville (1978).

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APPENDICES

Appendix A. Fin clips given to fish too small to tag in Henrys Fork tributaries, 1983.

System	Stream	Transect	Clip
	Robinson Creek	Above Falls YNP	None
		Below Falls YNP	None
	Little Robinson Creek	Above Junction w/Robinson Creek YNP	None
	Snow Creek	Headwaters	Ad
		End of Road 527	LV
		Above Snow Creek Road culvert	None
		Below Snow Creek Road culvert	None
Robinson Creek	Rock Creek	Upstream from Last Crossing of Cave Falls Road	Ad
		End Road 247	LV
		Below Road 490	Ad
	Wyoming Creek	Upstream from Road 124	Ad
		End of Road 576	LV
	Beaver Creek	Upstream from Cave Falls Road	LV
	Spring Creek	End Road 490	UC
	Porcupine Creek	In Howell Ranch	LV
		Parallel to Cave Falls Road	Ad
		Guard Station GAWS	RV
	Rising Creek	Along Cave Falls Road	None
	Fish Creek	North Fork GAWS	Ad
		Near Stephens Fish Creek Ranch	LV
	Warm River	Headwaters below Scout Camp	None
		Above junction with Partridge Creek	LV
		Pole Bridge Campground GAWS	Ad
Warm River		1 km below Pole Bridge Campground	UC
		GAWS Station above Warm River Spring	LV,RV,Ad
	Partridge Creek	At end of Road 499	None
		At junction with Warm River	None
	Moose Draw	Junction with Warm River	None
	Boone Creek	Near Wyoming Border below Indian Lake	None
Falls River		GAWS Station at Road 042	None
	Conant Creek	GAWS Station near Buggy Springs	Ad
		Campsite below Buggy Springs	LV
		Below Road 263	LV

Appendix A. Continued.

System	Stream	Transect	Clip
Fall River (Con't)	Squirrel Creek	At Henry Meadows Road Crossing	Ad
		at end of Road 580	
		Downstream from Bergman Ditch Diversion	None
		Below Road 263	None
		Downstream from Squirrel Road	LV
Buffalo River	Buffalo River	T13N R44E Section 20	Ad
	Chick Creek	Upstream from Road 291	None

Appendix B. Summary of lengths, weights and condition of salmonids sampled by electrofishing from Henrys Fork tributaries, 1983.

Stream – transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout – total length (mm)													
						<49	50–	75–	100–	125–	150–	175–	200–	225–	250–	275–	300–	325–	350–	375–
Robinson Creek																				
Above Falls YNP	7/27	CTT	182	—	—					1	2	5	2	2						
Below Falls YNP	7/27	CTT	162	—	—				2	1	1	2			1					
Little Robinson Creek																				
Above junction w/ Robinson Cr YNP	7/27	BRK	85	—	—	20	12	5	4	3	5	3	1	1						
		CTT	189	—	—					1	3	1	4	1						
Snow Creek																				
Headwaters	6/22	BRK	99	—	—	1	4	6	7	2		1								
Upstream from Rd. 527	6/22	BRK	87	—	—	3	1	14	2	1	2									
Above Snow Cr Rd. culvert	6/22	BRK	109	—	—			6	2	1	1	1								
		CTT	152	—	—						1									
Below Snow Cr Rd. culvert	6/22	BRK	119	—	—			2		1		1								
Rock Creek																				
Upstream from last crossing of Cave Falls Rd.	7/8	BRK	140	35	1.3		2	4	3	14	14	2	2							
End of Rd 247	7/15	BRK	140	53	1.7	2	2	5	12	9	12	6	5							
		CTT	144	25	0.8					1										
Below Rd 490	7/12	BRK	157	63	1.5		5	7	75	87	31	59	41	16	6		1			
		WRB	226	160	1.4							1	1	1	1					
		HYB	225	142	1.3								1							
		CTT	220	—	—								1							
		MWF	260	—	—										2					

Appendix B. Continued.

Stream - transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout - total length (mm)													
						<49	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-
Wyoming Creek																			
Upstream from																			
Rd. 124	7/8	CTT	174	57	1.1						1								
		BRN	189	101	1.5						4	8	2	2					
Downstream from																			
Rd. 124	7/12	BRN	175	74	1.4					2	5	5	2						
		CTT	195	90	1.2						1								
End of Rd. 573	7/6	CTT	215	130	1.3								1						
End of Rd. 576	7/13	CTT	213	132	1.3							2	2		1	1			
		BRN	204	114	1.3								3						
Beaver Creek																			
Upstream from																			
Cave Falls Rd.	7/8	BRK	97	24	1.3	17	1	12	13	7	2	4	2						
Spring Creek																			
End of Rd. 490	6/29	BRK	156				4	1			4	7	2	1					
Porcupine Creek																			
In Howell Ranch	6/29	BRK	164	71	1.4	2	4		3	17	26	15	11	1	4				
		BRN	118	32	2.0				1										
Parallel to Cave																			
Falls Rd.	6/28	BRK	116	55	1.3	6	15	1	1	9	11	4	4						
Guard Station																			
GAWS	6/30	BRK	153	65	1.4		9	4	7	16	29	18	9	2	1				
		WRB	155	43	1.2					1	1								
		BRN	289	338	1.4											2			

Appendix B. Continued.

Stream - transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout - total length (mm)														
						<49	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-
Rising Creek																				
Along Cave																				
Falls Rd.	6/28	BRK	93			4		3	2	1			1							
		BRN	137							5	1									
Fish Creek																				
North Fork GAWS	6/22	BRK	105				29	19	14	21	7	2	1							
Near Stephens																				
Fish Creek Ranch	6/23	BRK	160	49	1.2			1	18	12	31	35	5							
		CTT	126	71	1.2		1					1								
Warm River																				
Headwaters below																				
Scout Camp	8/4	BRK	80			3	28	5	7	4	2	1								
Above junction																				
with Partridge	7/26-																			
Cr	7/28	BRK	140	46	1.4		13		40	43	19	15	14	5	3					
		WRB	240	188	1.3							1	1	3	1	1				
		HRB	244	182	1.3								1	3	3					
		BRN	211	149	1.6								1							
Pole Bridge Camp-																				
ground GAWS	7/26	BRK	121	30	1.3	1	5	11	18	4	2									
		WRB	217	130	1.2						1	4	7	5	1	1				
		HRB	202	97	1.2							9	14	2						
1 km below																				
Pole Bridge	8/29-																			
Campground	8/31	BRK	102	61	1.4		24	10	3	11	6	2	1							
		WRB	229	155	1.3									1						
GAWS above Warm	7/28-																			
R. Springs	7/29	BRK	138	57	1.5	1	8		5	27	17	2	6							
		WRB	164	87	1.6		1	3	10	10	10		9	4	2			1		
		HRB	217	116	1.1								3		1					
		BRN	155	55	1.4				1	8	5	2	1							
		MWF	363	412	1.4										1			1	2	4

Appendix B. Continued.

Stream – transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout – total length (mm)													
						<49	50–	75–	100–	125–	150–	175–	200–	225–	250–	275–	300–	325–	350–	375–
Warm River (Con't)																			
Warm River Campground	8/20	BRK	196	140	1.3				1				1		1				
		WRB	162	179	1.2			2	22	11	7	9	6	6	3	2	1		
		HRB	213	110	1.0							1	1	1					
		BRN	166	178	1.2		4		7	10	6	3	3	1	1				
		MWF	262										1	14	25	13	4		
Partridge Creek																			
End of Rd. 499	8/16	BRK	124	56	1.6	7	5	28	15	19	25	10	2	2					
At junction w/ Warm River	8/4	BRK	88			7	41	9	13	4	8	5							
Moose Draw																			
At junction w/ Warm River	8/31	BRK	117				3				2		1						
		WRB	91	36	1.8		10	10	3	1	1	1	1						
		HRB	189	83	1.2						2		1						
		BRN	71				2												
Boone Creek																			
Near Wyoming border below Indian Lake	8/18	BRK	144	27	0.9					1									
GAWS Station at Rd. 042	8/17	WRB	110	—	—			1											
		CTT	315	350	1.1												1		

Appendix B. Continued.

Stream - transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout - total length (mm) <49	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-
Conant Creek																				
GAWS Station near Buggy Springs	8/5-11	BRK	155	137	1.3	2	8	2	6	8	5	7	7	4	4	1				
		WRB	172	189	1.7			7	7	4	2	1	5	1	1	1	1	2	1	
		HYB	205	76	1.1						1	1	1							
		CTT	185	64	1.0							1								
		MWF	186	170	1.3		1		10	1	2	3	1	5	2	1		1	1	
Campsite below Buggy Springs	8/10-8/11	BRK	174	171	1.3	1		2	5	1	1	2	2	3	1	1	1			
		WRB	150	222	1.4		6	9	1		3	2	2		1		1			
		MWF	214	271	1.1				6	1	2			4	7	2	2			
Boone Creek Con't																				
Below Rd. 263	8/5	BRK	196	102	1.4							1								
		WRB	205	109	1.3							1	1							
		HRB	225	130	1.1									1						
		MWF	277					1	1								1	3	2	
At Henry Meadows Road Crossing	8/19	BRK	183	126	1.6			1			2	3				1				
		WRB	233	206	1.6					2	1	2				1	1	1	1	
		MWF	203	235	1.2			1		1	1		1			2	1			
Squirrel Creek																				
At end of Rd. 580	8/12	BRK	144	95	1.4	1	12		6	5	6	7	10	1	1					
		CTT	161	94	1.6			1	5	1		3	1	1	2					

Appendix B. Continued.

Stream - transect	Date	Species	Mean length (mm)	Mean weight (gm)	Mean K	Number of trout - total length (mm)													
						<49	50-	75-	100-	125-	150-	175-	200-	225-	250-	275-	300-	325-	350-	375-
Downstream from Bergman Ditch Diversion	8/18	HRB	232	118	0.9									1					
		CTT	80					1											
Downstream from Crossing Rd. 263	8/12	HRB	223										1	1					
Downstream from Squirrel Rd.	8/18-8/19	BRK	137	77	1.4		6	18	5	15	14	7	6	3	1	1			
		MWF	295	290	1.1											1			
Buffalo River T13N R44E Section 20	9/2-13	BRK	121	107	1.4		14	61	14	25	12	11	10	1	2		1		
		WRB	114	99	1.4	3	32	24	16	14	16	9	7	1					
Chick Creek Upstream from Rd. 291	9/1	BRK	96	50	1.3		8	2	5	2	2								
		WRB	110	52	1.3		2	2	3		2								

[1]Species abbreviations: BRK-Brook Trout, WRB-Wild Rainbow, HRB-Hatchery Rainbow, HYB-Rainbow-Cutthroat Hybrids, CTT-Cutthroat Trout, BRN-Brown Trout, MWF-Mountain Whitefish

[2]k-factors computed from mean lengths and weights of fish for which weight was recorded.

Appendix C. Summary of snorkel count estimates of trout population abundance in Henrys Fork tributaries, 1983.

					Left Bank			Right Bank			Center Area				
Stream – transect	Date	Visib. [m]	L [m]	$\bar{W}$ [m]	Area [m^2]	# counts	Mean ± CI[3]	Area [m^2]	# counts	Mean ± 95% CI	Total area [m^2]	Area counted [m^2]	# counts	Mean ± 95% CI	N ± 95% CI
Robinson Creek															
End Rd. 470	9/14	3	190	6	570	2	24±15	570	2	24±5	Total area covered by two divers				
Canyon-Run	9/14	2.5	63	14	220	3	14±5	220	3	16±3	439	315	6	12±1	17±1
Canyon-Pool	9/14	2.5	60	15	210	3	12±3	210	3	38±10	480	300	6	22±10	35±16
Three Rivers Ranch	10/6	2	165	20	495	3	15±9	495	3	8±5	2255	660	6	5±3	18±10
Warm River															
Above Cascade	8/3/82	3	155	15.3			141[1]			110[1]	Not counted				
	3/21	3	155	15.3		1	95		1	53	Included with bank counts				
	8/31	3	120	15.3	484	3	64±8	472	3	98±4	876	717	6	50±9	61±11
Below Cascade	8/30	2.5	81	22	210	3	0	274	4	12±4	1191	210	12	3±1	15±7
Boone Creek															
Near Wyoming border below Indian Lake	9/12	2	350	5	988	1	1	988	1	0	Total area covered by two divers				
Buffalo River															
Above Buffalo Campground	9/1	3	335	39	2010	2	280±0	2010	2	255±205	9157	2010	4	255±68	1159±308
Below US 20 Bridge by Pond's Lodge	9/1	2	265	50	1060	1	9	1060	1	1	11130	1060	4	14±6	150±60

[1] 8/3/82 means are summed means for 3 replicate counts in upper portion of transect and two replicate counts in lower portion of transect.

[2] 8/3/82 population estimates do not include center area of transect.

Appendix C. Continued.

Stream – transect	Population Estimate: Transect	#/km	#/ha	% >305 mm	Species composition	Remarks
Robinson Creek						
End Rd. 470	49±7	255	425	10.2	57% BRN, 32% WRB, 11% BRK	No whitefish or suckers observed
Canyon-Run	47±9	746	534	36.1	57% WRB, 22% BRK, 21% BRN	Whitefish and suckers abundant
Canyon-Pool	85±29	1416	944	20.0	80% WRB, 13% BRK, 7% BRN	Whitefish and suckers abundant
Three Rivers Ranch	41±24	248	126	0	50% WRB, 25% BRK, 25% BRN	Whitefish and suckers abundant
Warm River						
Above Cascade	251[2]	1619[2]	1058[2]		98% WRB, 1% BRK, <1% BRN	Whitefish estimate 57
	148	955	624		96% WRB, 4% BRK	Whitefish estimate 41
	223	1866	1163	8.9	97% WRB, 3% BRK, <1% BRN	Whitefish estimate 213, suckers abundant
Below Cascade	27	380	161	18.6	100% WRB	Whitefish estimate 247, Utah sucker estimate 89
Boone Creek						
Near Wyoming border below Indian Lake	1	—	—	100	100% WRB	Only one fish seen
Buffalo River						
Above Buffalo Campground	1694	5057	1850	N.A.	100% BRK	Large schools of brook trout in deep pools
Below US 20 Bridge by Pond's Lodge	160	604	121	N.A.	75% RB, 25% BRK	

[1] 8/3/82 means are summed means for 3 replicate counts in upper portion of transect and two replicate counts in lower portion of transect.

[2] 8/3/82 population estimates do not include center area of transect.

Appendix D. Summary of total catch, number of marked fish at large and receptures in Rock Creek below Rd. 490, 7/12-14/83.

Date	Total catch [C]	Total marked fish at large [M]	Receptures [R]	CxM
7/12	69	0	0	0
7/13	176	69	12	12075
7/14	220	233	62	51260
Totals			74	63335

Appendix E. Body-scale regressions for trout sampled by electrofishing from Henrys Fork tributaries, 1983.

Stream	Transect	# fish	Body-scale regression	r^2
Brook Trout				
Little Robinson Cr	Above junction with Robinson Creek YNP	21	Y=-11.2+4.66X	0.82
Snow Creek	Headwaters above Snow Creek Butte Road	18	Y=8.3+3.8X	0.90
	Upstream from Rd. 527	19	Y=34.4+2.7X	0.91
	Above and below Snow Creek Rd. culvert	15	Y=3.0+4.2X	0.85
Rock Creek	Above Cave Falls Rd.	23	Y=15.4+4.1X	0.73
	Along Rd. 247	32	Y=-11.7+5.0X	0.83
	Below Rd. 490	35	Y=1.5+4.7X	0.72
Beaver Creek	Above Cave Falls Rd.	25	Y=5.4+4.3X	0.78
Porcupine Creek	In Howell Ranch	16	Y=59.9+3.1X	0.73
	Guard Station GAWS	17	Y=1.8+4.4X	0.87
Rising Creek	Along Cave Falls Road	9	Y=-34.6+5.9X	0.66
Fish Creek	North Fork GAWS	31	Y=-1.0+4.3X	0.85
	Near Stephens Fish Cr Ranch	38	Y=22.7+3.6X	0.72
Warm River	Headwaters near Scout Camp	12	Y=-1.6+4.0X	0.97
	Above junction w/Partridge Creek	12	Y=39.3+3.7X	0.82
	Pole Bridge campground GAWS	18	Y=70.2+2.1X	0.48
	1 km downstream from Pole Bridge campground	15	Y=2.1+4.2X	0.91
	GAWS Station above Warm River Springs	13	Y=-21.3+5.2X	0.77
Partridge Creek	End Rd. 499	37	Y=-6.8+4.9X	0.75
	Above junction w/Warm River	10	Y=-3.6+4.8X	0.75
Conant Creek	GAWS Station near Buggy Springs	15	Y=19.4+3.9X	0.84
	At Henry Meadows Rd crossing	6	Y=18.4+4.2X	0.52
Squirrel Creek	Downstream from Squirrel Rd.	19	Y=17.3+4.0X	0.88
Buffalo River	T13N R44E Section 20	13	Y=21.0+4.4X	0.87
Chick Creek	Upstream from Rd. 291	10	Y=-11.5+4.4X	0.93

Appendix E. Continued.

Stream	Transect	# fish	Body-scale regression	r^2
		Rainbow Trout [Wild]		
Warm River	Above junction w/ Partridge Creek	5	Y=164+0.8X	0.35
	Pole Bridge Campground GAWS	12	Y=90.0+1.52X	0.48
	GAWS Station above Warm River Springs	12	Y=-34.8+3.3X	0.86
Moose Draw	Above junction with Warm River	15	Y=3.11+2.3X	0.88
Conant Creek	GAWS Station near Buggy Springs	13	Y=11.5+2.7X	0.83
	At Henry Meadows Road crossing	8	Y=-36.0+3.0X	0.94
Buffalo River	T13N R44E Section 20	11	Y=18.6+2.4X	0.89
Chick Creek	Upstream from Rd. 291	6	Y=49.8+1.3X	0.67
		Cutthroat Trout		
Robinson Creek	Above impassable falls YNP	14	Y=18.7+3.5X	0.83
	Below impassable falls YNP	5	Y=45.0+2.9X	0.84
Little Robinson Cr	Above junction w/Robinson Creek YNP	3	Y=-176.5+8.8X	0.99
Wyoming Creek	End Rd. 576	5	Y=150.5+0.7X	0.02
		Brown Trout		
Wyoming Creek	End Rd. 576	32	Y=54.8+1.5X	0.56
Rising Creek	Along Cave Falls Rd.	6	Y=129.5+0.1X	0.01
Warm River	GAWS Station above Warm River Springs	9	Y=39.7+1.6X	0.72

Appendix F. Age-class frequency and survival estimates of wild rainbow trout sampled by electrofishing from Henrys Fork tributaries in 1983.

Stream	Transect	Dates surveyed	0+	I+	II+	III+	IV+	V+	Survival
Porcupine Creek	Guard Station GAWS	6/30		2					
Warm River	Above junction w/Partridge Creek	7/26-28				4	3		--
	Pole Bridge Campground GAWS	7/26			2	8	1		--
	GAWS Station above Warm River Springs	7/28-29		32	9	5			0.40
Moose Draw	Above junction w/Warm River	8/31	20	3	4				--
Conant Creek	GAWS Station near Buggy Springs	8/5,10, 11		18	7	2	2		--
	Campsite below Buggy Springs	8/10,11	1	8	6	1			0.35
	At Henry Meadows Rd. crossing	8/19		5	0	3	1		--
Buffalo River	T13N R44E Section 20	9/2,13	43	21	7				0.40
Chick Creek	Upstream from Rd. 291	9/1	2	5	2				--

Appendix G. Age-class frequency and survival estimates for brook trout sampled by electrofishing from Henrys Fork tributaries, 1983.

Stream	Transect	Dates surveyed	0+	I+	II+	III+	IV+	Survival (S)
Little Robinson Cr	Above junction with Robinson Cr YNP	7/27	29	13	8	1		0.33
Snow Creek	Headwaters upstream from Rd. 527	6/22	3	14	4	2		0.38
	Above Snow Creek Rd. culvert	6/22	0	7	4			0.57
	Below Snow Creek Rd. culvert	6/22		2	2			--
Rock Creek	Upstream from last crossing of Cave Falls Rd.	7/8		9	28	4		0.14
	End Rd. 247	7/15	4	27	22			--
	Below Rd. 490	7/13-15	4	181	106	37	2	0.22
Beaver Creek	Upstream from Cave Falls Rd.	7/8	18	31	11			0.35
Porcupine Creek	In Howell Ranch	6/29	6	46	27	4		0.29
	Parrallel to Cave Falls Rd.	6/28	21	22	8			0.36
	Guard Station GAW	6/30	12	50	28	2		0.20
Rising Creek	Along Cave Falls Road	6/28	4	6	0	1		--
Fish Creek	North Fork GAWS	6/22	12	41	26	6		0.38
	Near Stephens Fish Creek Ranch	6/23		20	74	8		0.11
Warm River	Headwaters near Scout Camp	8/4	26	16	4	2		0.35
	Above junction w/Partridge Creek	7/26-28	13	104	27	4		0.20
	Pole Bridge Campground GAWS	7/26	6	33	2			0.06
	1 km below Pole Bridge Campground	8/29-31	34	21	3			0.14
	GAWS Station above Warm River Springs	7/28-29	8	48	7			0.15
Partridge Creek	At end of Rd. 499	8/16	10	45	53	5		0.09
	Above junction w/Partridge Creek	8/4	48	24	10	5		0.46
Moose Draw	Above junction w/Partridge Creek	8/31	4	0	1	1		--
Boone Creek	Near Wyoming Border below Indian Lake GAWS Station	8/18		1				--
Conant Creek	Near Buggy Springs	8/5,10, 11	6	26	7	7		0.52
	Campsite on Buggy Springs Rd.	8/10,11	1	9	4	4	1	0.48
	At Henry Meadows Rd. crossing	8/19	1	5	1			0.20
Squirrel Creek	Downstream from Squirrel Rd.	8/18,19	25	32	16	3		0.31
Buffalo River	T13N R44E Section 20	9/2,13	63	44	5	1		0.15
Chick Creek	Upstream from Rd. 291	9/1	11	6	3			0.50

Appendix H. Age-class breakdown of cutthroat trout sampled from Henrys Fork tributaries, 1983.

System	Stream	Transect	Dates surveyed	0+	I+	II+	III+
Robinson Creek	Robinson Creek	Above impassable Falls YNP	7/27		2	6	
		Below impassable Falls YNP	7/27		3	0	1
	Little Robinson Creek	Above junction w/ Robinson Cr YNP	7/27		2	1	1
	Wyoming Creek	Upstream from Rd.	7/12			1	
		End Rd. 576	7/13			3	1
	Fish Creek	Near Stephens Fish Creek Ranch	6/23			1	
Falls River	Boone Creek	GAWS Station at Rd. 042	8/17				1
	Conant Creek	GAWS Station near Buggy Springs	8/5,10,11			1	

Appendix I. Age-class breakdown of rainbow-cutthroat hybrid trout sampled by electrofishing from Henrys Fork tributaries in 1983.

System	Stream	Transect	Dates surveyed	0+	I+	II+	III+
Robinson Creek	Robinson Creek	Below impassable Falls YNP	7/27		1		
	Little Robinson Creek	Above junction with Robinson Creek YNP	7/27		4	2	
	Wyoming Creek	Downstream from Rd. 124	7/12		1		
		End Rd. 576	7/13			4	
	Porcupine Creek	Guard Station GAWS	6/30			1	
Falls River	Conant Creek	GAWS Station near Buggy Springs	8/5,10,11			1	2

Appendix J. Age-class breakdown of brown trout sampled from Henrys Fork tributaries in 1983.

System	Stream	Transect	Dates surveyed	0+	I+	II+
Robinson Creek	Wyoming Creek	Upstream from Rd. 124	7/8		16	
		Downstream from Rd. 124	7/12		14	
		End of Rd. 576	7/13		3	
	Porcupine Creek	Howell Ranch	6/29		1	
		Guard Station GAWS	6/30			2
	Rising Creek	Along Cave Falls Rd.	6/28		6	
Warm River	Warm River	GAWS Station above Warm River Springs	7/28,29		17	
	Moose	Above junction w/	8/31	2		

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FISH AND GAME
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FISHERY RESEARCH

IDAHO FISH & GAME

FEDERAL AID IN FISH RESTORATION

Job Performance Report, Project F-73-R-7

Subproject IV: River and Stream Investigations

Study III, Job 1: Henrys Fork Fisheries Investigations

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Jody Bratrom and Robert Spatcholte
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August, 1985

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JOB PERFORMANCE REPORT

State of: Idaho

Name: RIVER AND STREAM INVESTIGATIONS

Project No.: F-73-R-7

Title: Henrys Fork Fisheries Investigations

Subproject No.: IV

Study No.: III

Job No.: 1

Period Covered: March 1, 1984 - February 28, 1985

ABSTRACT

A survey of Warm River and Robinson Creek as spawning and rearing areas for both resident and adfluvial rainbow and brown trout was conducted in 1984 using electrofishing and snorkeling techniques. Population estimates, species compositions, redd surveys and tagging studies were made. In addition, a creel census was conducted on Warm River to estimate effort and harvest.

Wild trout populations ranged from 206/km to 5,789/km in Warm River, 188/km to 730/km in Robinson Creek and were 436/km in Rock Creek, 23/km in Wyoming Creek and 7,047/km in Porcupine Creek. A greater abundance of fish was found within the deeper pools in Warm River and Robinson Creek during September, which may indicate they are important wintering areas. Brown trout were the dominant species in mid and upper Robinson Creek, while rainbow trout were predominant in mid and upper Warm River and Lower Robinson Creek.

Average lengths for brown and rainbow trout were variable among stream sections, but generally were highest in Robinson Creek and tributaries. Average lengths at annulus were largest for trout sampled in the Henrys Fork. The average length of rainbow trout in the Henrys Fork has declined from 284 mm in 1973 to 198 mm in 1984, indicating more conservative regulations may be necessary to increase size of trout available to anglers.

Spawning surveys showed a minimum of 158 brown trout redds and a minimum of 150 rainbow trout redds in lower Warm River. Size of spawners indicated that Henrys Fork trout were extensively using lower Warm River as a spawning area; no brown trout redds were observed in the Henrys Fork.

Anglers fished an estimated 7,998 hours and harvested 3,942 fish for an overall catch rate of 0.05 fish/hr. in Warm River between Memorial Day and Labor Day. Catch rates were best in lower Warm River

(1.2 fish/hr.) with hatchery catchables 46% of the harvest, followed by 46% wild rainbow.

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OBJECTIVES

To describe the abundance, distribution, movement and spawning significance of salmonids in tributaries to the Henrys Fork Snake River (Warm River, Robinson Creek).

RECOMMENDATIONS

1. Conduct yearly redd surveys on Warm River and Robinson Creek to obtain trends of brown and rainbow trout spawning activity.

2. Consider implementing more restrictive regulations on the Henrys Fork to increase average size of trout available to anglers.

INTRODUCTION

The Henrys Fork Snake River provides one of the most important rainbow trout (Salmo gairdneri) fisheries in Idaho in terms of habitat, fish populations and angler use (IDFG Fisheries Management Plan 1981). Studies have been conducted periodically since 1973 to assess fish population abundance and angler use and harvest on the Henrys Fork above St. Anthony. In the 21.2 km section from Lower Mesa Falls to Wendell bridge (Hwy. 20), angler effort and harvest increased from 1973 to 1976, while mean length of wild rainbow trout decreased 23 mm (Coon 1977). An angler survey conducted in that section in 1980 found that 34% of the anglers rated fishing as good, while 65% rated it as fair to poor. Abundance and size were cited as the main reasons for dissatisfaction with the fishery (Rohrer 1981).

Brown trout (Salmo trutta) were first introduced to the Henrys Fork drainage below Mesa Falls in 1969 to increase angling opportunity and to relieve angler pressure on rainbow trout populations. The initial plant was made in Robinson Creek, a major drainage entering Warm River near Ashton, Idaho (Fig. 1). Subsequent plants have occurred in Warm River, Robinson Creek and the Henrys Fork below Warm River (Table 1).

A baseline survey was conducted in the Warm River and Robinson Creek drainages in 1983 to assess fish population abundance, species composition and age and growth in the systems. Rainbow trout were common in most of Warm River and lower Robinson Creek, while brown trout were common in lower Warm River and upper Robinson Creek. Both species exhibited slower growth than their counterparts in the Henrys Fork (Spateholts and Moore 1985).

The present study was initiated to determine if Warm River and Robinson Creek are important spawning and rearing areas for Henrys Fork rainbow and brown trout populations and to evaluate the status of brown trout in the drainage.

Table 1. Brown trout fry introductive releases in the Henrys Fork drainage between Mesa Falls and Ashton Dam, Idaho, 1969-1984.

Date	Number[a]	Location
5-13-69	9,940	Robinson Creek at crossing of Road 241
6-16-69	24,200	Robinson Creek at end of Road 470
6-17-69	27,225	Robinson Creek at end of Road 470
9-18-73	36,900	Robinson Creek at end of Road 470
9-23-74	40,800	Robinson Creek at end of Road 470
5-17-80	55,606	Henrys Fork at Stone bridge below mouth of Warm River
	4,000[b]	Warm River along railroad grade to Warm River Spring
	4,000[b]	Robinson Creek from mouth to Road 241
7-29-80	67,200	Henrys Fork at Stone Bridge
4-17-81	77,280	Henrys Fork at Stone Bridge
	10,260	Warm River at Warm River campground
	10,260[b]	Robinson Creek from mouth upstream
4-22-81	25,650	Henrys Fork at Stone Bridge
4-21-82	34,560	Warm River below Fish Creek Bridge
4-27-82	22,800	Warm River below Robinson Creek
6-15-82	12,500[b]	Robinson Creek from mouth to Road 241
	12,500[b]	Warm River from Warm River campground to Warm River Springs
6-16-82	43,500[b]	Henrys Fork from Ashton Dam to Mesa Falls
1-20-83	70,000	Warm River at Highway 47 Bridge
7-6-84	640,000	Henrys Fork at Stone Bridge

[a]Idaho Department of Fish and Game planning records.
[b]Distributed by Trout Unlimited members.

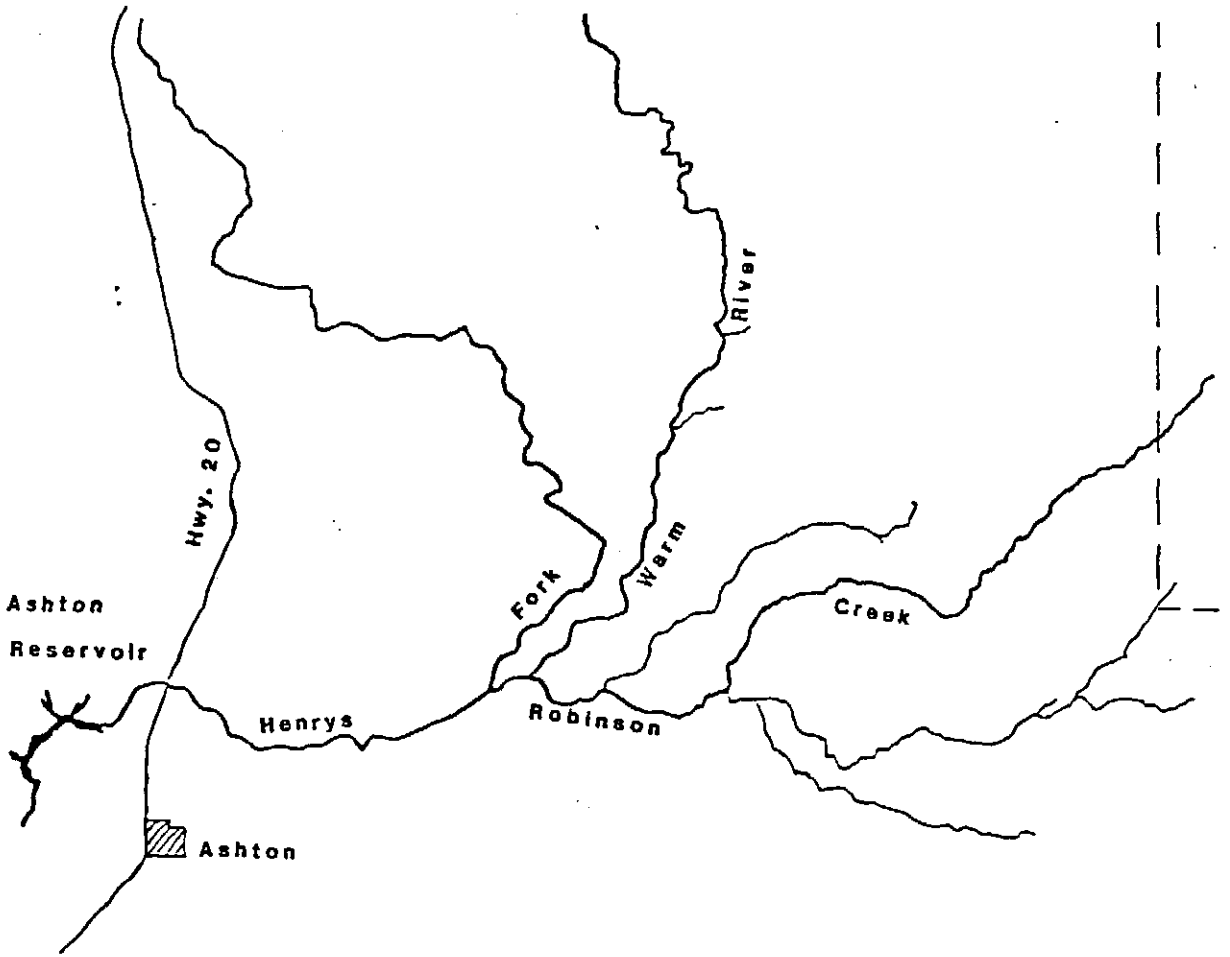


Figure 1. Map of the study area showing the Henrys Fork of the Snake River, Warm River and Robinson Creek.

DESCRIPTION OF STUDY AREA

The Warm River and Robinson Creek drainages are located approximately 16 km east-northeast of Ashton, Idaho. Elevation ranges from 1600 to 1950 m. Mean annual precipitation is over 73 cm and mean annual temperature is 5.3 C at Ashton (Whitehead 1978). Primary land uses are forestry, grazing and recreation; most of the land is federally owned.

Warm River Springs has a discharge of 5.33 cms and a constant temperature of 11 C, pH of 7.2 and specific conductance of 125 micromhos. Warm River drains an area of 375 km^2, has a mean annual discharge of 5.95 cms and a peak discharge of 25.58 cms.

Robinson Creek originates in Yellowstone National Park. Much of the drainage is also spring fed. It drains 326 km^2, has a mean annual discharge of 3.4 cms and a peak discharge of 34.2 cms (Whitehead 1978). Substantial reaches of both Warm River and Robinson Creek are contained in narrow canyons of over 45 m in depth. This combined with gated forest roads makes access limited.

The portion of the Henrys Fork in the study area includes the 21.2 km reach between Wendell bridge and Mesa Falls. Mean annual discharge at Warm River is 30.30 cms and at Ashton, is 40.81 cms (Whitehead 1978). The section above the confluence of Warm River is in a steep canyon which has limited access. The portion below Warm River has a few access points, and the majority of the land is privately owned.

Game fish species found in the study area include rainbow trout, brown trout, brook trout (Salvelinus fontinalis), cutthroat trout (Salmo clarki), rainbow x cutthroat hybrids and mountain whitefish (Prosopium williamsoni). A complete list of species found in the study area is given in Spateholts (1985).

TECHNIQUES USED

Fish Sampling

Several methods were used to capture fish for tagging and age and growth studies. Electrofishing with either a canoe-mounted generator and DC shocker or pulsed DC backpack shockers were employed in Warm River, Robinson Creek and tributaries where possible, often in conjunction with population estimates. In some areas, rod and reel sampling was used. Electrofishing in the Henrys Fork was done by use of a Coffelt VVP-20 mounted in a jetboat and used with a handheld positive electrode, or with a generator and DC shocker mounted in a drift boat.

Fish were anesthesized in MS-222, measured for total length to the nearest millimeter, and scale samples were taken posterior to the dorsal fin and directly above the lateral line. Fish over 175-200 mm were

tagged either with monel jaw tags or color-coded and numbered floy tags. Smaller fish sampled later in the season were given permanent fin clips based on drainage of capture.

Population Estimates

Population estimates were made on transects established in 1983 by Spateholts (1985) as well as three additional transects (Figs. 2 and 3). Mark-recapture methodology using either a canoe-mounted generator and pulsed DC shocker or DC backpack shocker were used to estimate trout abundance at transects WR1, WR6, WR7 and RC5. Fish were anesthesized with MS-222, measured to the nearest millimeter, marked with monel jaw tags, floy tags, or fin clips and released. The population estimate was made using the modified Peterson Mark-Recapture formula (Ricker 1975):

$$N = (M+1)(C+1)/(R+1)$$

where N = population estimate
M = number of fish marked
C = number of fish caught on recapture run
R = number of marked fish recaptured

and a standard error $SE(\hat{N})$:

$$SE(\hat{N}) = \frac{(\hat{N}^2)(C-R)}{(C+1)(R+2)}$$

A snorkel area-density method described by Schill (1983) and Spateholts and Moore (1985) was used to estimate trout densities in transects WR2-WR5 and RC1-RC5. Trout in size classes greater and less than 330 mm were counted by species. One to three bank replicates and two to seven center replicates were made, counts averaged and numbers expanded to transect area. A direct count was possible at transect RC5 as visibility enabled two divers to see the entire area of the transect.

A two-pass population estimate was made at transects in Rock Creek, Wyoming Creek and Porcupine Creek using DC backpack shockers. The formula described by Seber and LeCren (1967) was used:

$$\hat{N} = \frac{(u_1)^2}{(u_1 - u_2)}$$

where $\hat{N}$ = fish population estimate
u_1 = number of fish collected on first pass
u_2 = number of fish collected on second pass

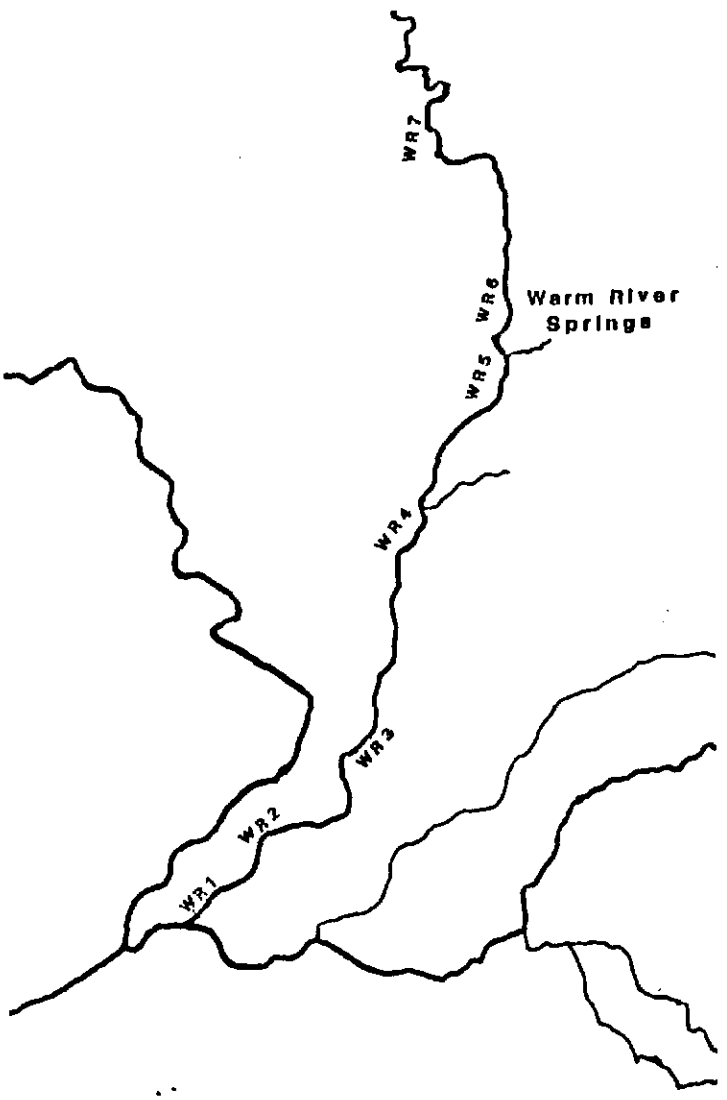


Figure 2. Locations of electrofishing and snorkel transects on Warm River, 1984.

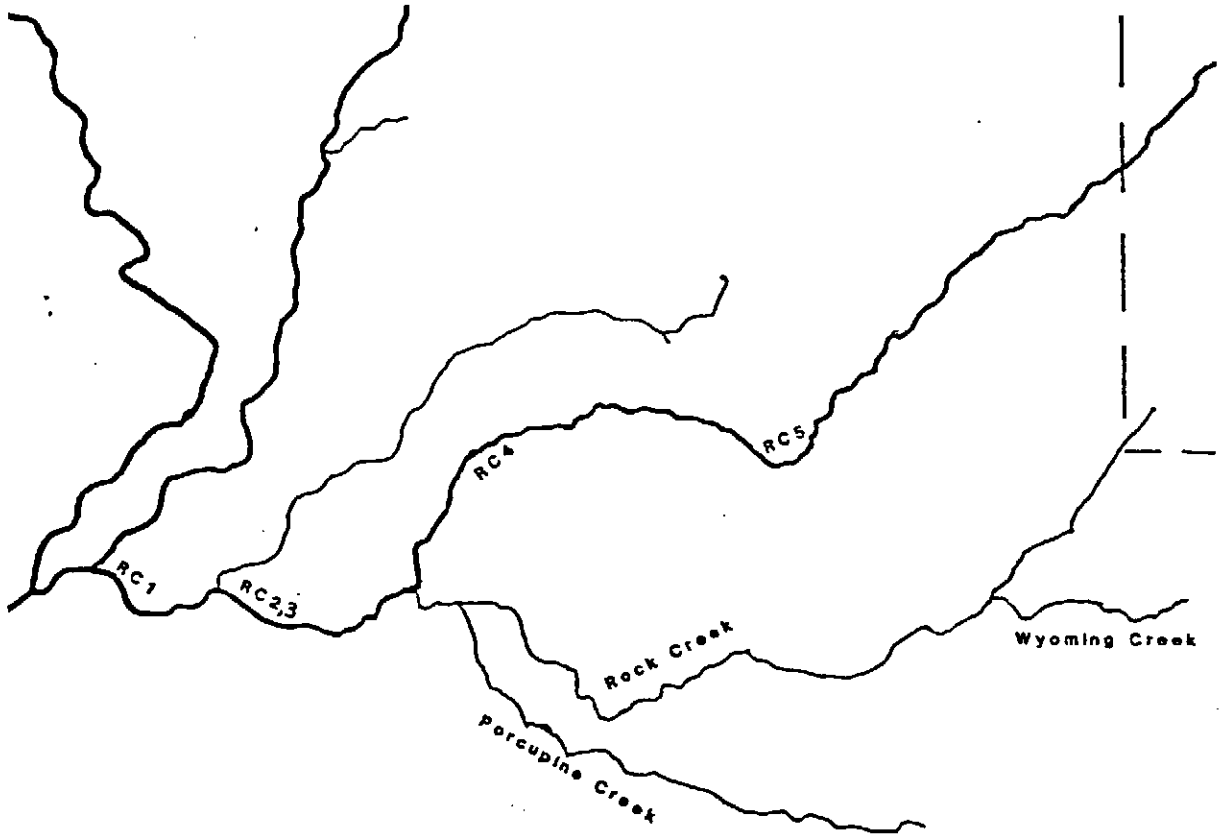


Figure 3. Locations of electrofishing and snorkeling transects on Robinson Creek, 1984.

and a standard error SE $(\hat{N})$:

$$SE(\hat{N}) = \frac{(u_1)^2(u_2)^2(u_1+u_2)}{(u_1-u_2^4)^{\frac{1}{4}}}$$

The Zippin method (1958) was used in Rock Creek transect number 2 when more than 50% of the number of fish caught in the first run were captured on the second run. Four passes were made and the maximum likelihood estimator described in Platts et al. (1983) was used.

Fish Movement and Migration

Fish movements were determined from angler tag returns and from recaptures during electrofishing and rod and reel sampling. Distances moved from location of tagging were recorded.

A weir was constructed on Warm River to assess immigration and emigration of spawners and juveniles. It was located 1.6 km upstream from the mouth of Warm River (within WR1) and had two upstream trap boxes and two downstream trap boxes. The weir was installed July 9 and removed September 20. Numerous problems associated with bridge construction downstream and upstream from the weir site, resulting in flooding and collapse, rendered the weir inoperable most of that time.

Age and Growth

An intense effort was made to collect rainbow and brown trout scale samples from all sections sampled. All other trout except brook trout were sampled when encountered. Scales were dry mounted between two microscope slides and read at 72x magnification on a Bausch and Lomb Triplex Projector. Distances from focus to each annulus and the scale edge were measured to the nearest millimeter at a 30° angle from the longest axis of the scale. Body-scale regressions were calculated using the following formula:

$$L = C + (S_N/S)[(L-C)]$$

where:
- L = back-calculated length at annulus N
- C = correction factor for length at scale formation
- S_N = distance to scale radius at annulus N
- S = distance to scale edge
- L = length of fish at capture

Since body length-scale regressions had poor fits (Table 2), literature values of 35 mm for rainbow trout and 40 mm for brown trout were used as values for C (Carlander 1969).

Table 2. Body length-scale radius regressions for trout sampled in Warm River, Robinson Creek and the Henrys Fork, 1984.

Stream	Species	Number of fish	Body-scale regression	r^2
Warm River and tributaries	Rainbow below cascade	102	Y = 60.20 + 2.846X	0.70
	Rainbow above cascade	90	Y = 71.24 + 2.43X	0.53
	Rainbow, all sections	192	Y = 61.59 + 2.729X	0.64
	Brown, all sections	187	Y = 66.93 + 2.621X	0.54
Robinson Creek and tributaries	Rainbow, all sections	49	Y = 199.3 + 1.036X	0.22
	Brown, all sections	182	Y = 130.5 + 1.259X	0.17
Henrys Fork	Rainbow	197	Y = 0.0 + 1.000X	1.00
	Brown	25	Y = 111.1 + 2.136X	0.42

Brown Trout Spawning and Redd Counts

Aerial surveys were conducted to determine areas, extent and timing of brown trout spawning activity on the Henrys Fork from Wendell bridge to Mesa Falls, Warm River from mouth to Warm River Springs and Robinson Creek from mouth to Yellowstone National Park. Counts were conducted October 16, November 1, November 15 and December 6 from a Maule flying at 150-235 m above the stream. Ground surveys were conducted periodically on Warm River and Robinson Creek where access was still available from October to the beginning of December. Painted rocks were placed on existing redds so they would be discernible later in the season and to minimize duplicate counts of redds on subsequent flights.

Length and age data on brown trout spawners were collected by electrofishing on Warm River and the Henrys Fork in October and November and on Robinson Creek in November. Water temperature was recorded periodically to monitor temperature at spawning.

Rainbow trout redds were counted by ground survey in Warm River the last week of March, 1985, from the Warm River campground downstream to the Highway 47 bridge. Length data on rainbow spawners were collected by electrofishing at the same location March 25-29.

Warm River Creel Census

A low intensity creel census was conducted on Warm River to assess angler use and harvest from the season opener (May 26) to Labor Day (September 3), 1984. Angler counts were conducted on two weekend days and two weekdays each month. Additional counts were conducted on opening weekend, July 4, and Labor Day weekend. Two counts (morning and afternoon) were conducted on each count day.

The river was divided into five sections based on accessibility and habitat (Fig. 4):

Section 1, (0.7 km) from the Highway 47 bridge to the Fish Creek Road bridge. This section is paralleled by a paved road and is easily accessible. Hatchery rainbow trout are stocked at the Fish Creek bridge. The river is wide with low gradient, sand-gravel substrate and good overhanging bank cover and instream vegetation mats.

Section 2, (0.6 km) from the Fish Creek Road bridge to above Warm River campground. This section has easy access from Warm River campground. Hatchery rainbow are planted throughout the area. The river has shallow riffles with some deep pools and gravel-rubble substrate.

Section 3, (12.0 km) from Warm River campground to Warm River Springs. This section is paralleled by the abandoned Union Pacific right-of-way, which is closed to motorized vehicles. Access is limited to foot or bicycle travel from Warm River campground, Warm

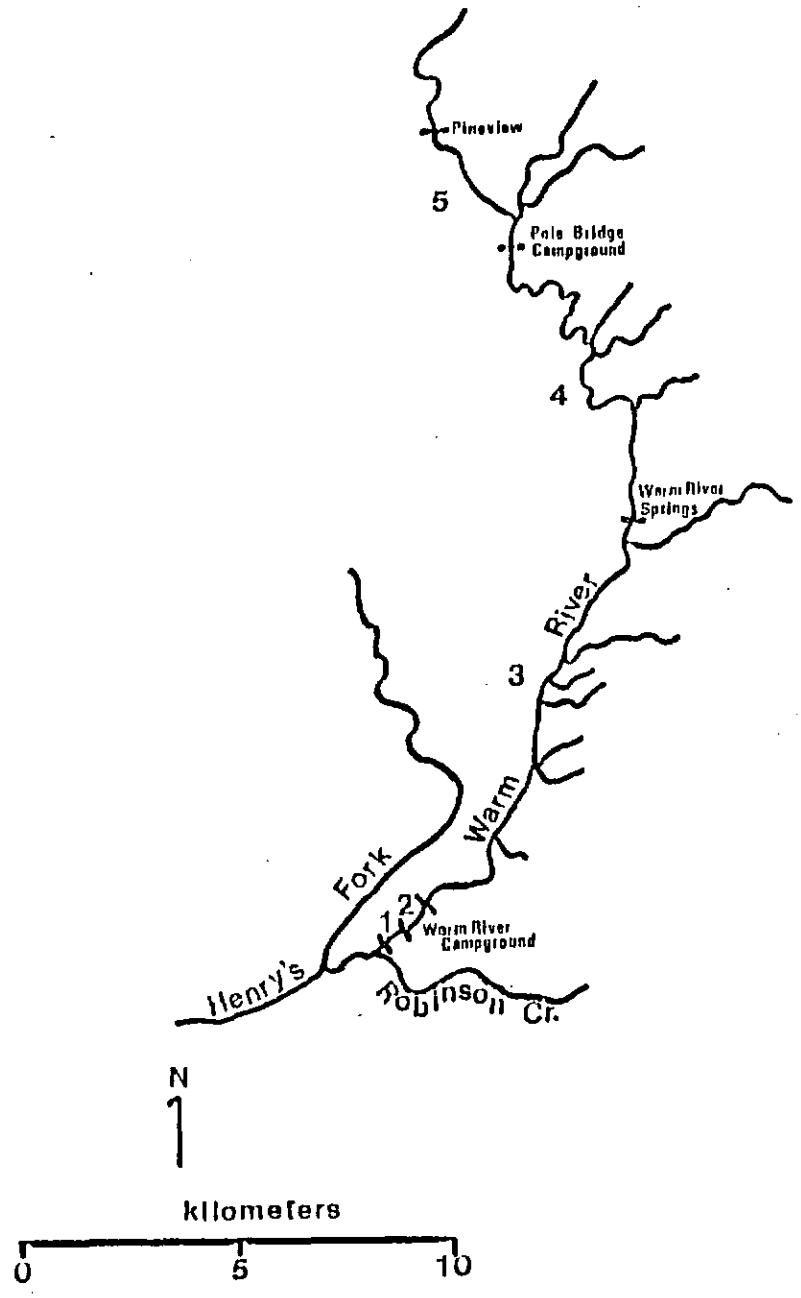


Figure 4. Map of Warm River showing creel census sections.

River Springs, or the Bear Gulch Ski Area (located in the middle of the section). No trout are stocked in this section. The river lies in a steep canyon with steep cascades, deep pools and boulder strewn riffles. Warm River Springs contributes 200 cfs of 11 C water at the head of the section.

Section 4, (10.7 km) Warm River Springs to Polebridge campground. Except at Warm River Springs and Polebridge campground, this section is only accessible by foot. Hatchery rainbow trout are stocked at the bridge above Warm River Springs and at Polebridge campground. The river above the springs lies in a steep canyon. Gradient is low to moderate, with a meandering channel.

Section 5, (4.1 km) Polebridge campground to Pineview. This section has road access at the campground and at Pineview and along the Union Pacific Railroad right-of-way. No trout are stocked above Polebridge campground. Gradient is low, with pools, riffles and beaver ponds. Dense willow growth occurs along the banks.

Angler counts were made by driving along the road paralleling Section 1 to Warm River campground, up the railroad bed to Warm River Springs and to upstream access points at Polebridge and Pineview. If vehicles were parked at access points but anglers were not visible, the mean number of anglers per party (determined from interviews) were added for each vehicle.

Angler effort was estimated separately for weekdays, weekend days and special days for each interval. Total number of anglers counted in each section were divided by the number of counts to estimate mean number of anglers fishing at any given time. Mean number of anglers was multiplied by average day length (daylight hours) and by number of days of each type during the interval. Effort estimates for weekday, weekend and special days were summed to estimate total angler effort for each interval.

Angler interviews were done during counts and on other working days as time allowed to assess catch rates and species composition of the harvest. Number of anglers, total hours fished, type of gear, number and species of fish harvested and number of fish released were recorded for each party interviewed. Harvested fish were measured and examined for tags and fin clips. Catch rates were calculated by dividing total numbers of each species harvested plus numbers of fish released by total hours fished. Catch rates were multiplied by estimated hours of effort to estimate total harvest and total numbers of fish caught and released for each census interval.

FINDINGS

Fish Sampling

Calculated mean lengths for trout in each section sampled depended on the size of fish recruited to the type of sampling gear used. Young-of-year (YOY) were generally not sampled in large numbers during early electrofishing runs due to their greater vulnerability to mortality. Average lengths are therefore based on actual trout sampled and not necessarily those present in the transect. Sample sizes also were partially dependent on gear type used.

Average lengths of trout sampled in Warm River transects and tributaries ranged from 99 to 221 mm for rainbow trout, 88 to 188 mm for brown trout, 103 to 221 mm for brook trout and 209 to 307 mm for rainbow x cutthroat hybrids (Figs. 5 and 6). Species compositions ranged from 46% wild rainbow trout and 33% brown trout in WR1 and WR2 to 94% wild rainbow in WR3-6 and a minimum of 45% brook trout in WR7 and WR8. Brown trout fry were observed only in transects WR1 and WR2, while rainbow trout fry were observed in all transects and were most abundant in WR1 and WR2.

Average lengths of trout sampled in Robinson Creek transects and tributaries ranged from 93 to 273 mm for rainbow trout, 120 to 301 mm for brown trout, 118 to 157 mm for brook trout, 122 to 296 mm for rainbow x cutthroat hydrids and 77 to 278 mm for cutthroat trout. Species compositions ranged from a minimum of 50% wild rainbow in RC1-RC4 to a minimum of 60% brown trout in RC5. Rock Creek had 72% brook trout, Wyoming Creek 90% brown trout and Porcupine Creek 100% brook trout. Both brown and rainbow trout fry were observed throughout Robinson Creek. Brook trout fry were the only fry seen in Rock Creek and Porcupine Creek. No fry of any species were observed in Wyoming Creek.

Average lengths of trout sampled in the Henrys Fork were 198 mm for rainbow trout, 167 mm for brown trout and 296 mm for rainbow x cutthroat hybrids (Figs. 7 and 8). Species composition ranged from 95% wild rainbow and 5% brown trout in July to 56% wild rainbow and 44% brown trout in October. Both rainbow and brown trout fry were sampled.

Age and Growth

Rainbow trout

Age data for Warm River rainbow trout were divided into two groups; group one consisting of fish sampled below the cascade and group two consisting of fish sampled above the cascade. Mean weighted back-calculated lengths at annulus for all age classes in group one were 108 mm at annulus I, 185 mm at annulus II, 251 mm at annulus III, 283 mm at annulus IV, 346 mm at annulus V, 369 mm at annulus VI and 399 mm at

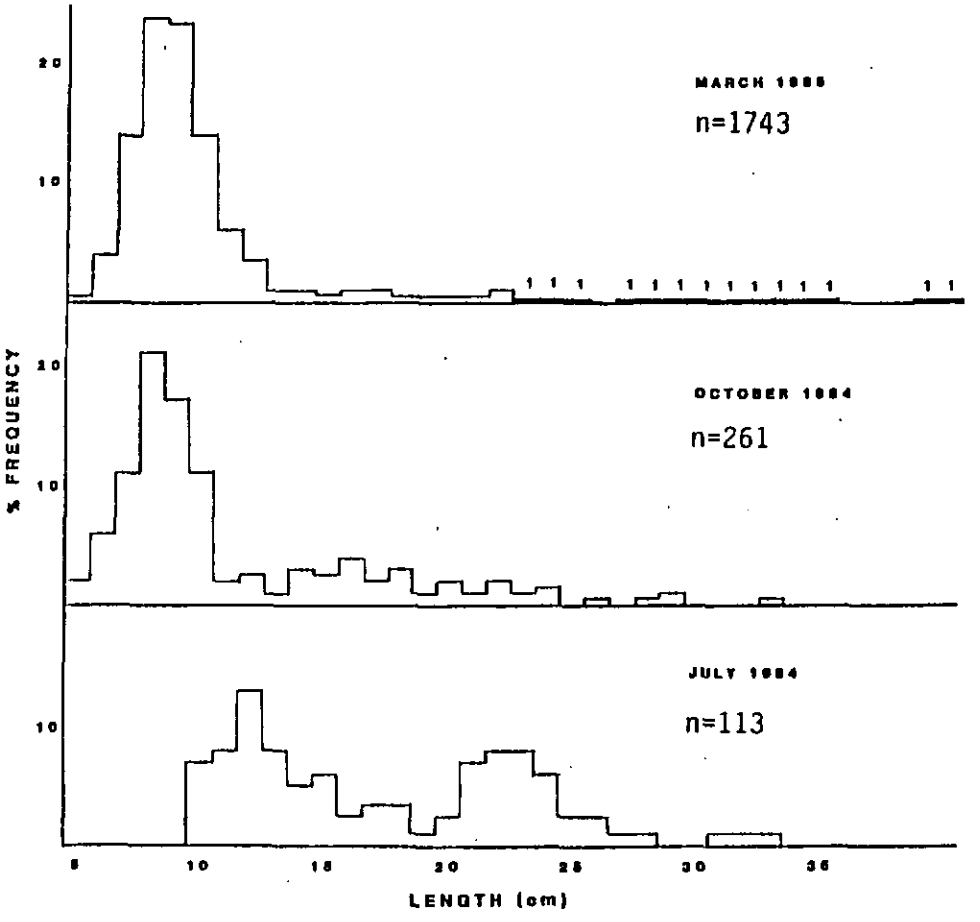


Figure 5. Length frequencies of rainbow trout sampled in Warm River transect WR1.

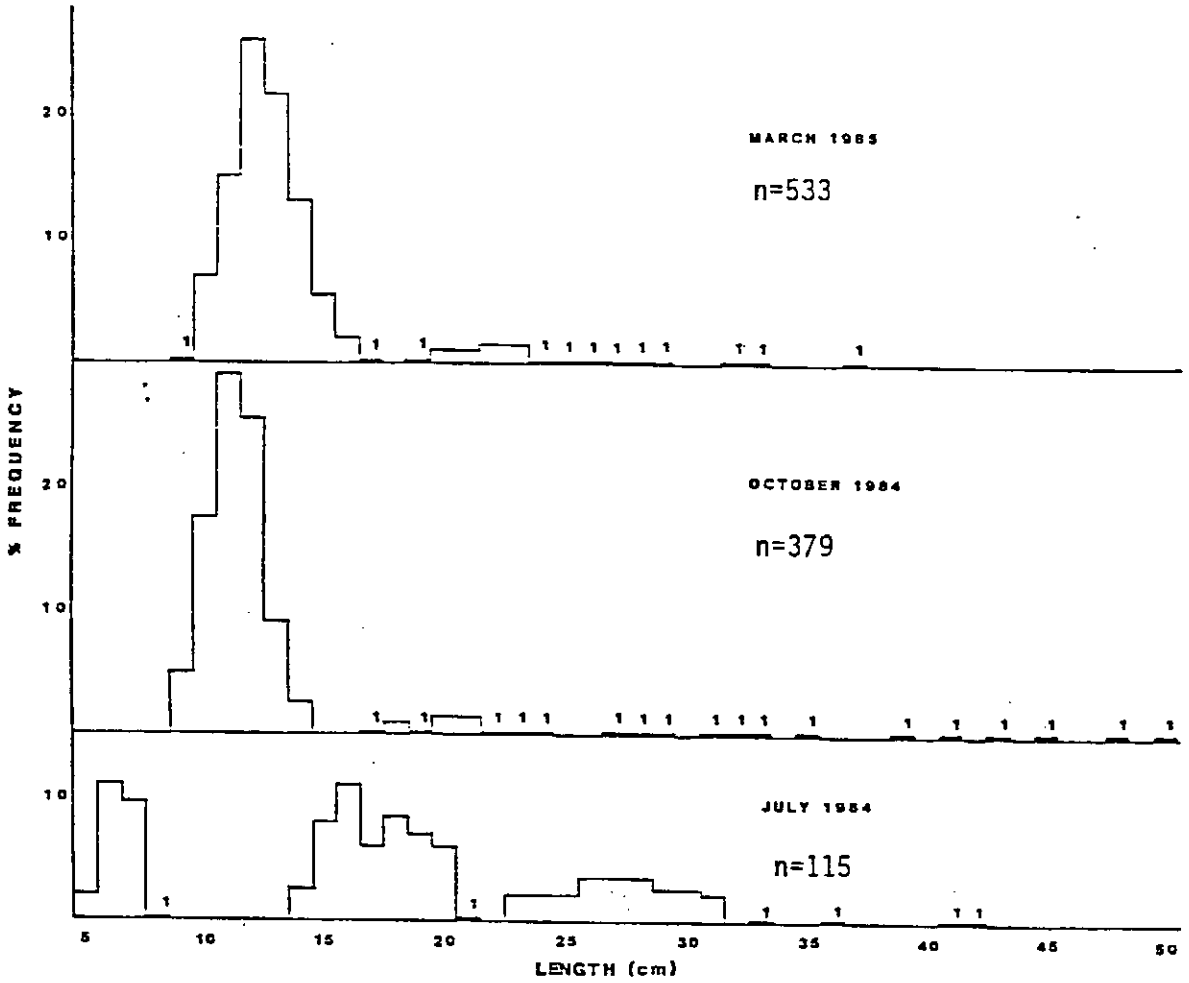


Figure 6. Length frequencies of brown trout sampled in Warm River transect WR1.

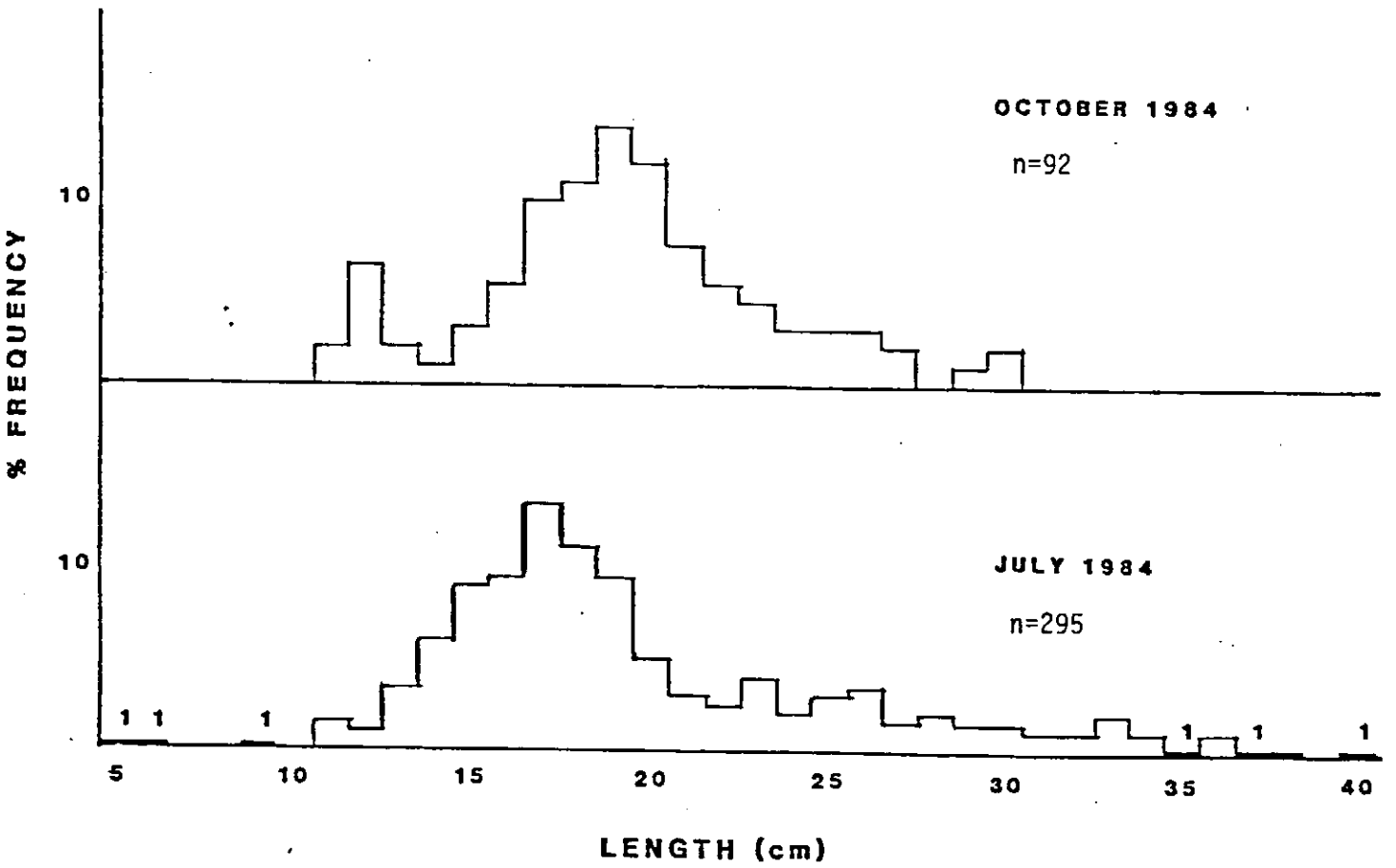


Figure 7. Length frequencies of rainbow trout sampled in the Henrys Fork below Warm River.

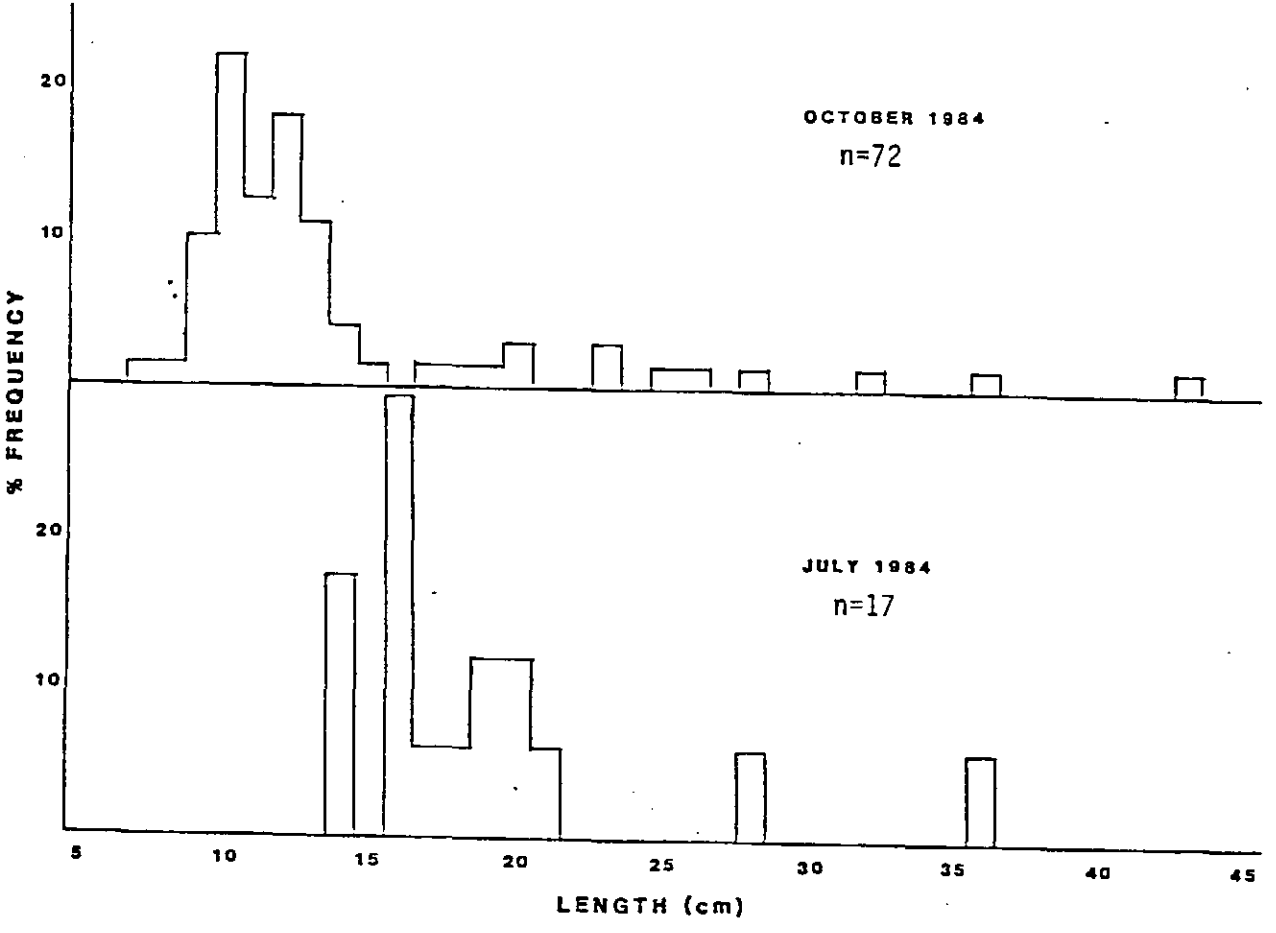


Figure 8. Length frequencies of brown trout sampled in the Henrys Fork below Warm River.

annulus VII (Table 3). Grand mean lengths at annulus for group two rainbow trout were 107 mm at annulus I, 160 mm at annulus II, 199 mm at annulus III, 217 mm at annulus IV and 223 mm at annulus V (Table 4). Mean lengths at annuli II, III and IV were significantly different (p=.005) between the two groups when tested with a paired t-test.

Age data from rainbow trout sampled in Robinson Creek gave grand mean lengths of 96 mm at annulus I, 145 mm at annulus II, 203 mm at annulus III, 240 mm at annulus IV, 299 mm at annulus V, 322 mm at annulus VI and 317 mm at annulus VII (Table 5). One 342 mm age VII+ rainbow was sampled. Grand mean lengths for rainbow sampled in Rock Creek were 101 mm at annulus I, 190 mm at annulus II and 289 mm at annulus III (Table 6).

Calculated grand mean lengths at annulus for sampled rainbow trout in the Henrys Fork were 113 mm at annulus I, 191 mm at annulus II, 255 mm at annulus III, 317 mm at annulus IV and 349 mm at annulus V (Table 7). One 375 mm age V+ rainbow was sampled.

Brown trout

Since sample sizes were small in the section above the cascade, age data for brown trout sampled in Warm River were pooled. Calculated grand mean lengths at annulus were 109 mm at annulus I, 171 mm at annulus II, 252 mm at annulus III, 317 mm at annulus IV, 372 mm at annulus V, 417 mm at annulus VI and 467 mm at annulus VII (Table 8). One 505 mm age VII+ brown trout was sampled.

Calculated grand mean lengths at annulus for brown trout sampled in Robinson Creek were 105 mm at annulus I, 155 mm at annulus II, 214 mm at annulus III, 258 mm at annulus IV, 285 mm at annulus V and 287 mm at annulus VI (Table 9). The largest age VI+ brown trout sampled was 340 mm. Rock Creek brown trout had mean lengths of 106 mm and 198 mm at annulus I and II, respectively (Table 10). Brown trout sampled in Wyoming Creek had mean lengths of 115 mm at annulus I and 212 mm at annulus II (Table 11).

Brown trout sampled in the Henrys Fork had calculated grand mean lengths of 109 mm at annulus I, 181 mm at annulus II, 256 mm at annulus III, 322 mm at annulus IV and 374 mm at annulus V (Table 12). The oldest brown trout sampled was aged V+ and 435 mm in length.

Sample sizes for other species were too small to adequately summarize.

Population Estimates

Population estimates were made at Warm River transects during the months of July or August and March (WR1). Relative densities of trout aged I+ and older ranged from 206/km at WR6 to 873/km at WR1. The WR1 estimate in March was 5,789 trout/km when all trout except newly emerged brown trout fry were included.

Table 3. Mean calculated lengths at annulus and growth increments for rainbow trout sampled in lower Warm River, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V	VI	VII
1	43	149	110						
2	16	224	117	187					
3	18	269	99	166	238				
4	2	304	109	189	246	273			
5	0	--	--	--	--	--	--		
6	0	--	--	--	--	--	--	--	
7	1	436	105	199	269	292	346	369	399
Grand mean		276	108	185	251	283	346	369	399
Growth increment			77	66	32	63	23	30	

Table 4. Mean calculated lengths at annulus and growth increments for rainbow trout sampled in upper Warm River, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V
1	24	138	102				
2	28	199	115	171			
3	13	249	111	164	219		
4	3	275	111	169	216	246	
5	1	237	95	134	163	187	223
Grand mean		220	107	160	199	217	223
Growth increment			53	39	18	6	

Table 5. Mean calculated lengths at annulus and growth increments for rainbow trout sampled in Robinson Creek, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V	VI	VII
1	2	158	103						
2	14	205	97	148					
3	6	281	101	166	243				
4	7	292	93	138	198	253			
5	2	334	95	155	217	266	317		
6	3	390	96	135	205	258	313	356	
7	1	342	84	128	153	182	268	288	317
Grand mean		286	96	145	203	240	299	322	317
Growth increment			49	58	37	59	23		

Table 6. Mean calculated lengths at annulus and growth increments for rainbow trout sampled in Rock Creek, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III
1	0	—	—		
2	3	210	102	186	
3	3	287	100	194	289
Grand mean		249	101	190	289
Growth increment			89	99	

Table 7. Mean calculated lengths at annulus and growth increments for rainbow trout sampled in the Henrys Fork, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V
1	104	170	109				
2	52	232	105	189			
3	26	280	108	191	245		
4	5	337	119	210	280	322	
5	1	375	126	175	239	311	349
Grand mean		279	113	191	255	317	349
Growth increment			78	64	62	32	

Table 8. Mean calculated lengths at annulus and growth increments for brown trout sampled in Warm River, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V	VI	VII
1	49	182	130						
2	23	216	104	166					
3	23	272	100	169	248				
4	13	346	95	169	263	323			
5	4	423	126	208	286	334	390		
6	1	490	92	162	279	343	429	459	
7	1	505	113	150	185	267	296	374	467
Grand mean		348	109	171	252	317	372	417	467
Growth increment			62	81	65	55	45	50	

Table 9. Mean calculated lengths at annulus and growth increments for brown trout sampled in Robinson Creek, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V	VI
1	62	158	108					
2	48	194	99	152				
3	11	280	116	188	252			
4	7	325	109	192	247	304		
5	1	419	85	130	179	266	335	
6	3	309	113	113	176	204	234	287
Grand mean			105	155	214	258	285	287
Growth increment				50	59	44	27	2

Table 10. Mean calculated lengths at annulus and growth increments for brown trout sampled in Rock Creek, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II
1	8	146	107	
2	4	242	104	198
Grand mean		194	106	198
Growth increment			92	

Table 11. Mean calculated lengths at annulus and growth increments for brown trout sampled in Wyoming Creek, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III
1	0	--	—		
2	11	300	153	246	
3	1	302	76	178	269
Grand mean		300	115	212	269
Growth increment			97	57	

Table 12. Mean calculated lengths at annulus and growth increments for brown trout sampled in the Henrys Fork, 1984.

Age class	Sample size	Mean length (mm)	Calculated mean total length (mm) at annulus I	II	III	IV	V
1	14	179	115				
2	5	241	115	188			
3	3	353	93	175	284		
4	0	--	--	--	--		
5	1	435	114	179	227	322	374
Grand mean		302	109	181	256	322	374
Growth increment			72	75	66	52	

Population estimates were made during the months of July and August at Robinson Creek transects. Densities of trout aged I+ and older ranged from 188/km at RC1 to 730/km at RC5. Trout density in Rock Creek during July was estimated to be 436 fish/km. Species composition was predominantly brook trout. Estimated trout density in Wyoming Creek in August was 23 fish/km, the lowest of all areas surveyed. Porcupine Creek had an estimated trout density of 707 fish/km and 1,047 fish/km for transects 1 and 2, respectively.

Fish Movement and Migration

A total of 5,279 trout were tagged or marked during the study year. The number in the Warm River drainage included 3,374 rainbow trout, 1,301 brown trout and 100 of other trout species. Of those marked in the Robinson Creek drainage, 54 were rainbow trout, 175 were brown trout and 38 were other trout species. The number of trout marked in the Henrys Fork were 202 rainbow trout, 19 brown trout and 16 other trout species.

Recapture data on 63 trout that had been tagged in Warm River were obtained by Department personnel or through angler tag returns. All trout were recaptured at approximately the same location where they were tagged. Several hundred fin clipped trout were also recaptured at the same location where clipped.

Fifteen fish tagged in Robinson Creek that were later recaptured did not display any movement. Two brown trout tagged in 1983 in Wyoming Creek were recaptured at the same location in 1984.

Five of six fish that were originally tagged in the Henrys Fork and later recaptured showed significant movement. Two rainbow trout moved upstream approximately 4.8 km from the Henrys Fork to WR1, and one rainbow trout moved upstream in the Henrys Fork approximately 1.6 km. One rainbow trout moved downstream 3.2 km from the Henrys Fork to the head of Ashton Reservoir, and one rainbow trout moved downstream 14.5 km from the Henrys Fork to below the Ashton Dam.

Fourteen trout were captured moving upstream through the weir from July 21 to August 25 (Table 13). These included eight wild rainbow trout, two rainbow x cutthroat hybrids, one brown trout, one brook trout and two hatchery rainbow. No trout were captured moving downstream. In addition, 1,518 Utah suckers (Catostomus ardens), 18 longnose dace (Rhinichthys cataractae) and four mountain whitefish were captured in upstream trap boxes. ..

Trout Spawning and Redd Surveys

Aerial and ground surveys showed that the peak of brown trout spawning activity in Warm River occurred during the first two weeks of November (Table 14). A minimum of 158 redds were observed in a 1.9 km

Table 13. Trout captured in upstream trap boxes of Warm River weir, 1984.

Date captured	Species	Length (mm)
7-21	Hybrid	330
	Wild rainbow	249
7-22	Wild rainbow	292
7-24	Brown	80
7-26	Hatchery rainbow	240
	Brook trout	271
7-28	Wild rainbow	256
8-2	Wild rainbow	236
8-3	Wild rainbow	60
8-7	Wild rainbow	168
8-13	Wild rainbow	266
8-18	Hatchery rainbow	295
8-19	Wild rainbow	70
8-25	Hybrid	310

Table 14. Location and number of brown trout redds observed in Warm River, 1984.

Date	Number counted	Method[a]	Location
10-16-84	6	A	Below Fish Creek bridge
10-20-84	6	G	Below Fish Creek bridge
10-30-84	8	G	Below Fish Creek bridge
11-01-84	33	A	Above Warm River campground to Fish Creek bridge
	25	A	Below Fish Creek bridge
11-04-84	53	G	Above Warm River campground to Fish Creek bridge
	30	G	Below Fish Creek bridge
11-11-84	79	G	Above Warm River campground to Fish Creek bridge
	46	G	Below Fish Creek bridge
11-15-84	57	A	Above Warm River campground to Fish Creek bridge
	42	A	Below Fish Creek bridge
12-2-84	91	G	Above Warm River campground to Fish Creek bridge
12-4-84	67	G	Below Fish Creek bridge
12-6-84	--	A	Visibility poor, redds too difficult to discern.

[a]A=aerial survey, G=ground survey

section located approximately 1.3 km above the mouth of Warm River (Fig. 9). No redds were observed during aerial surveys at any other portion of Warm River. Brown trout spawners were sampled from lower Warm River from September through November. Lengths of 20 females ranged from 266 to 480 mm with a mean length of 330 mm. Age ranged from 3 to 5 years. Length of 24 males ranged from 205 to 505 mm with mean length of 353 mm (Fig. 10). Ages ranged from two to seven years old. Water temperatures during spawning ranged from 4 to 7 C, with average temperature of 5 C.

Early snow cover and shadows along Robinson Creek made it extremely difficult to observe redds during aerial surveys. In limited ground surveys at RC1 and RC5 a minimum of three to seven redds were observed, respectively. Thick surface and anchor ice were present in a large portion of Robinson Creek during the December 6 flight, making it impossible to see any redds. Female spawners sampled during November ranged in length from 215 to 445 mm, with mean length of 315 mm. Male spawners ranged in length from 284 to 384 mm, with mean length of 326 mm (Fig. 11). All spawners were from three to five years old.

No brown trout redds were observed on the Henrys Fork from Ashton Reservoir to Mesa Falls during any flight.

A minimum of 150 rainbow trout redds were counted in Warm River between the Highway 47 bridge upstream to 0.4 km above the Warm River campground (Fig. 12). A comparison between years is given in Table 15. Average lengths of spawners sampled were 335 mm for females (n=9, range 270-462 mm) and 252 mm for males (n=34, range 156-405 mm) (Fig. 13). No age data were collected.

Warm River Creel Census

Anglers fished an estimated 7,998 hours on Warm River between the season opener (Memorial Day) and Labor Day, 1984 (Table 16). They harvested 1,740 rainbow trout, 1,826 hatchery rainbow trout, 56 rainbow x cutthroat hybrids, 52 brook trout, 248 brown trout and 20 mountain whitefish (total harvest 3,942 fish, 0.5 fish per hour). Anglers released 4,956 fish (0.6 fish per hour). Total catch rate equaled 1.1 fish per hour. Mean lengths of harvested fish equaled 229 mm for hatchery rainbow, 242 mm for wild rainbow, 347 mm for brown trout and 305 mm for mountain whitefish (Table 17).

Effort and catch rates were quite variable between sections of Warm River. Forty-eight percent of the total effort on the portion of Warm River censused in 1984 occurred in the 1.3 km section between the Highway 47 bridge and the upper boundary of Warm River campground (Table 18). Catch rates in section 1 (2.1 fish/hr.) and section 2 (1.3 fish/hr.) were good, with 46% of the harvest in these sections consisting of hatchery rainbow trout (Table 19). Effort in the canyon section from Warm River campground to Warm River Springs was 2,316 hours (29% of total effort) with a catch rate of 1.1 fish/hr. In section 4, anglers fished 1,144 hours (14.3% of total) with a catch rate of 0.9 fish/hr. An estimated 695 hours of effort (8.7% of total) occurred

Table 15. Comparison between years of rainbow trout redds observed in Warm River, 1983 to 1985.

Section	Date		
	3-24-83[a]	3-22-84[a]	3-24-85
Highway 47 bridge to Fish Creek bridge	30	34	54
Fish Creek bridge to old railroad bridge	17	45	0
Old railroad bridge to campground bridge	present[b]	not checked	34
campground bridge to cascade	present[b]	not checked	61[c]

[a]From Spateholts and Moore (1985).
[b]Uncountable due to light conditions.
[c]Counted only to powerline crossing.

Table 16. Summary of harvested and released fish by interval from Warm River, 1984.

Interval	Hrs. effort	Fish harvested							Fish released	Total
		WRB	HRB	HYB	BRK	BRN	MWF	Total		
5/26-5/31	1,013	61	162	0	0	20	20	263	405	668
6/1-6/30	2,780	167	250	0	0	83	0	500	2,808	3,308
7/1-7/31	1,869	542	897	56	0	93	0	1,588	561	2,149
8/1-8/31	1,722	706	431	0	52	52	0	1,241	758	1,999
9/1-9/3	614	264	86	0	0	0	0	350	424	774
Total	7,998	1,740	1,826	56	52	248	20	3,942	4,956	8,898
% of total harvest		44.1	46.3	1.4	1.3	63	0.5	100.0		
Fish/hr.		0.22	0.23	0.01	0.01	0.03	0.00	0.49	0.62	1.11

Table 17. Means and range of game fish harvested by anglers in Warm River, 1984.

Species	Sample size	Mean length (mm)	Range
Hatchery rainbow trout	12	229	210-269
Wild rainbow trout	22	242	200-294
Brown trout	3	347	305-379
Mountain whitefish	1	305	—

Table 18. Angler effort and catch by section on Warm River, 1984.

	Section 1	Section 2	Section 3	Section 4	Section 5
Stream reach:	Highway 47 bridge to Fish Creek Rd. bridge	Fish Cr. Rd. bridge to above Warm R. campground	Above Warm R. campground to Warm River Springs	Warm River Springs to Polebridge campground	Polebridge campground to Pineview
Section length (km)	0.7	0.6	12.0	10.7	4.4
Hrs. effort	724	3,120	2,316	1,144	695
Percent of total effort	9.1	39.0	29.0	14.3	8.7
Angler hrs/km	1,034.0	5,200.0	193.0	106.9	169.5
Catch					
Number of fish harvested	1,076	1,845	686	676	0[a]
Number of fish released	387	1,933	1,643	304	0[a]
Total catch	1,463	3,778	2,329	980	0[a]
Number of fish harvested/km	1,537	3,075	57	63	0[a]
Number of fish released/km	553	3,221	137	28	0[a]
Total catch/km	2,090	6,296	194	91	0[a]

[a]Catch for Section 5 underestimated due to low numbers of interviews.

Table 19. Summary of angler interviews by section of Warm River, 1984.

Section	Number of anglers	Hours fished	% using			Fish harvested							Fish released	Total catch	Catch rate (fish/hr)		
			Bait	Lures	Flies	WRB	HRB	HYB	BRK	BRN	MWF	Total			Harvested	Released	Total
Section 1 Highway 47 bridge to Fish Creek Rd. bridge	5	10.0	60.0	20.0	20.0	7	2	0	0	3	1	15	6	21	1.5	0.6	2.1
Section 2 Fish Creek Rd. bridge to above Warm River campground	79	140.4	55.7	11.5	32.8	33	41	2	0	3	0	79	100	179	0.6	0.7	1.3
Section 3 Above Warm River campground to Warm River Springs	47	95.8	48.8	9.3	41.9	21	0	0	1	2	0	24	80	104	0.3	0.8	1.1
Section 4 Warm River Springs to Polebridge campground	24	48.5	81.8	4.5	13.6	3	24	0	0	0	0	27	14	41	0.6	0.3	0.9
Section 5 Polebridge campground to Pineview	2	1.2	100.0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Total	157	295.9	58.7	10.1	31.2	64	67	2	1	8	1	145	200	377	0.5	0.7	1.2

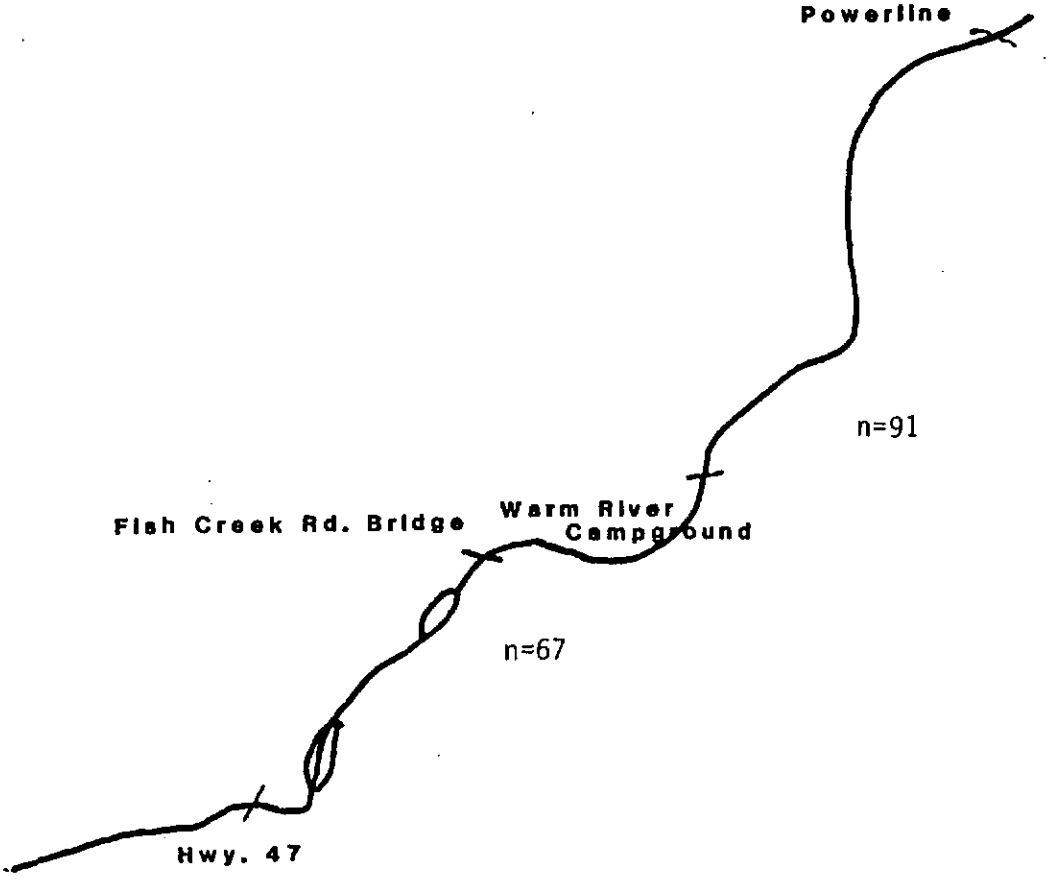


Figure 9. Locations of brown trout redds in Warm River, October-December, 1984.

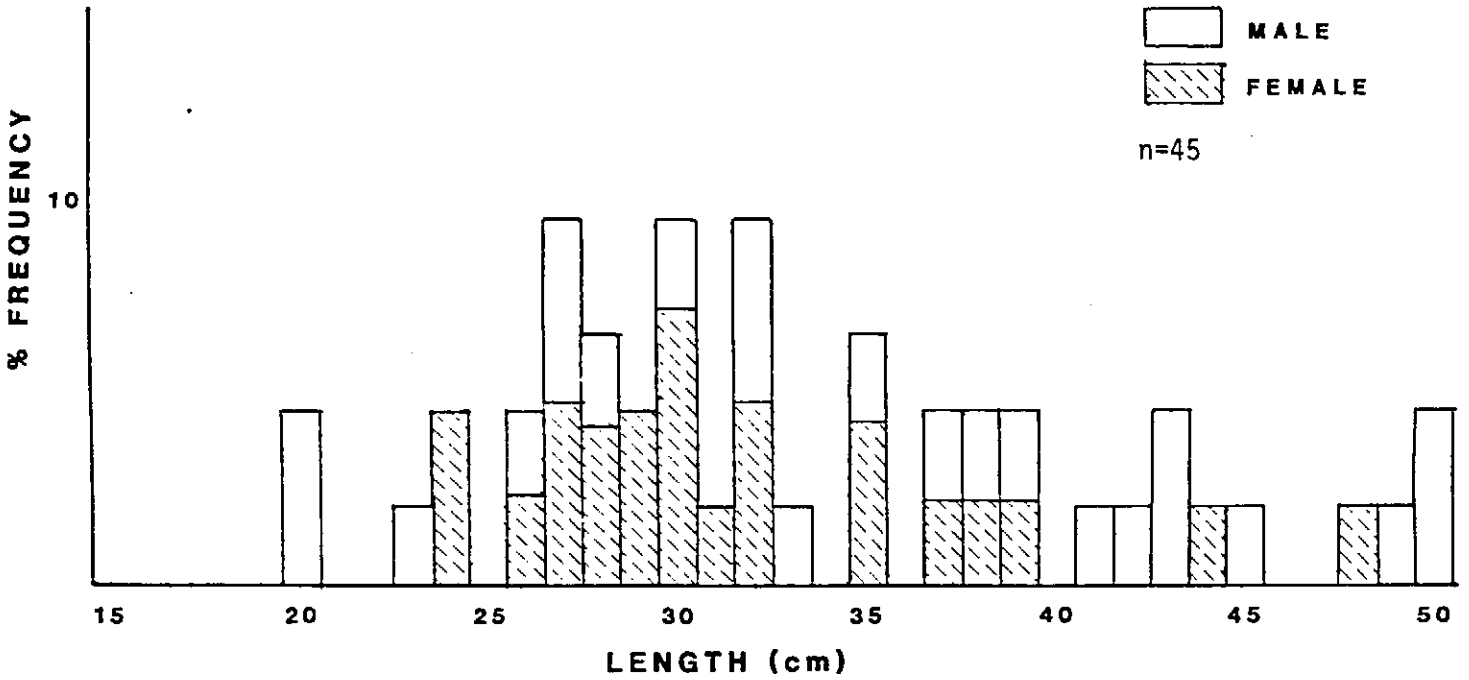


Figure 10. Length frequencies of brown trout spawners sampled in Warm River, 1984.

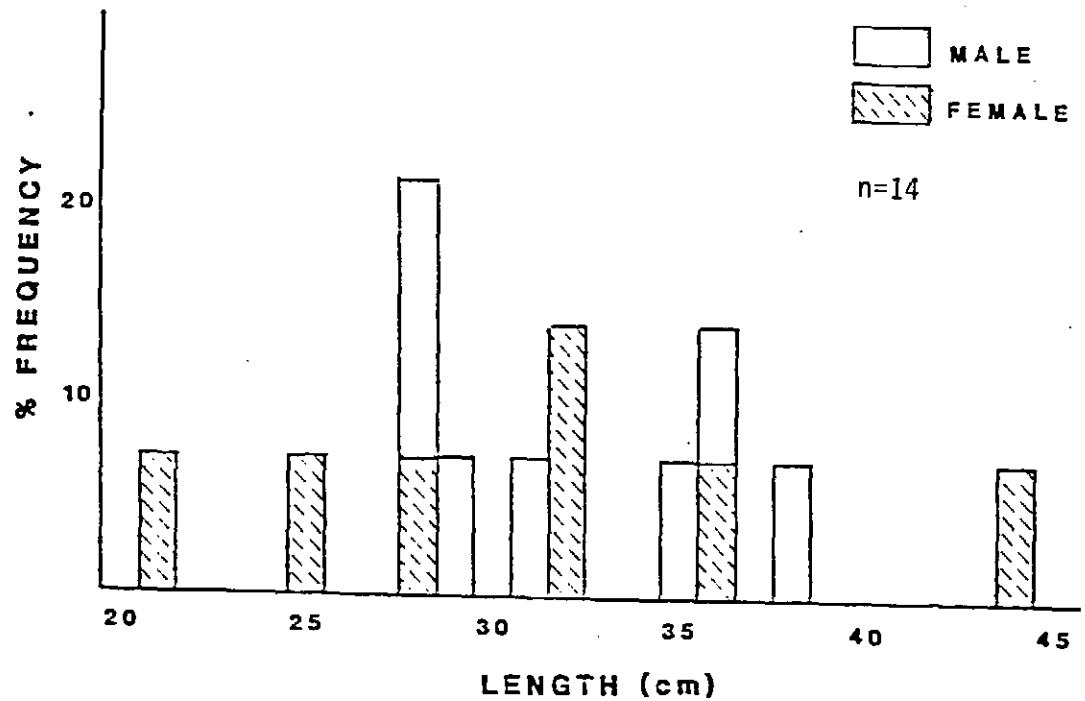


Figure 11. Length frequencies of brown trout spawners sampled in Robinson Creek, 1984.

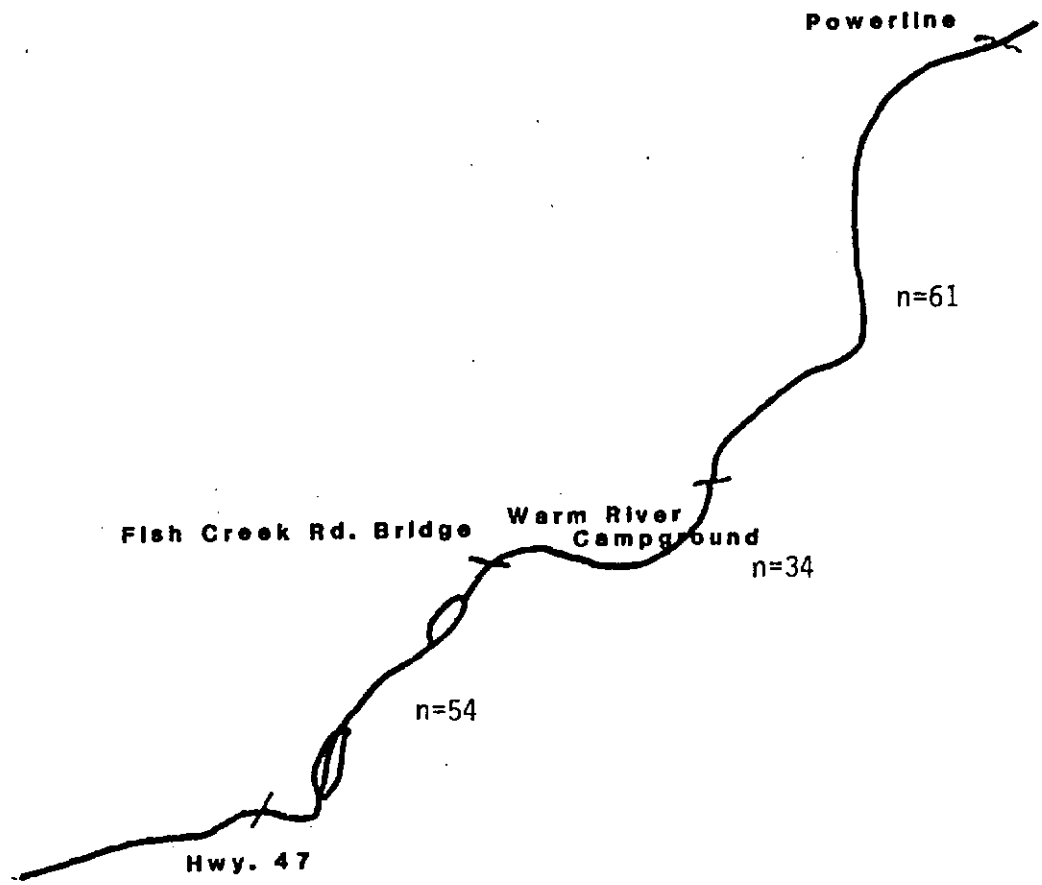


Figure 12. Locations of rainbow trout redds in Warm River, March, 1985.

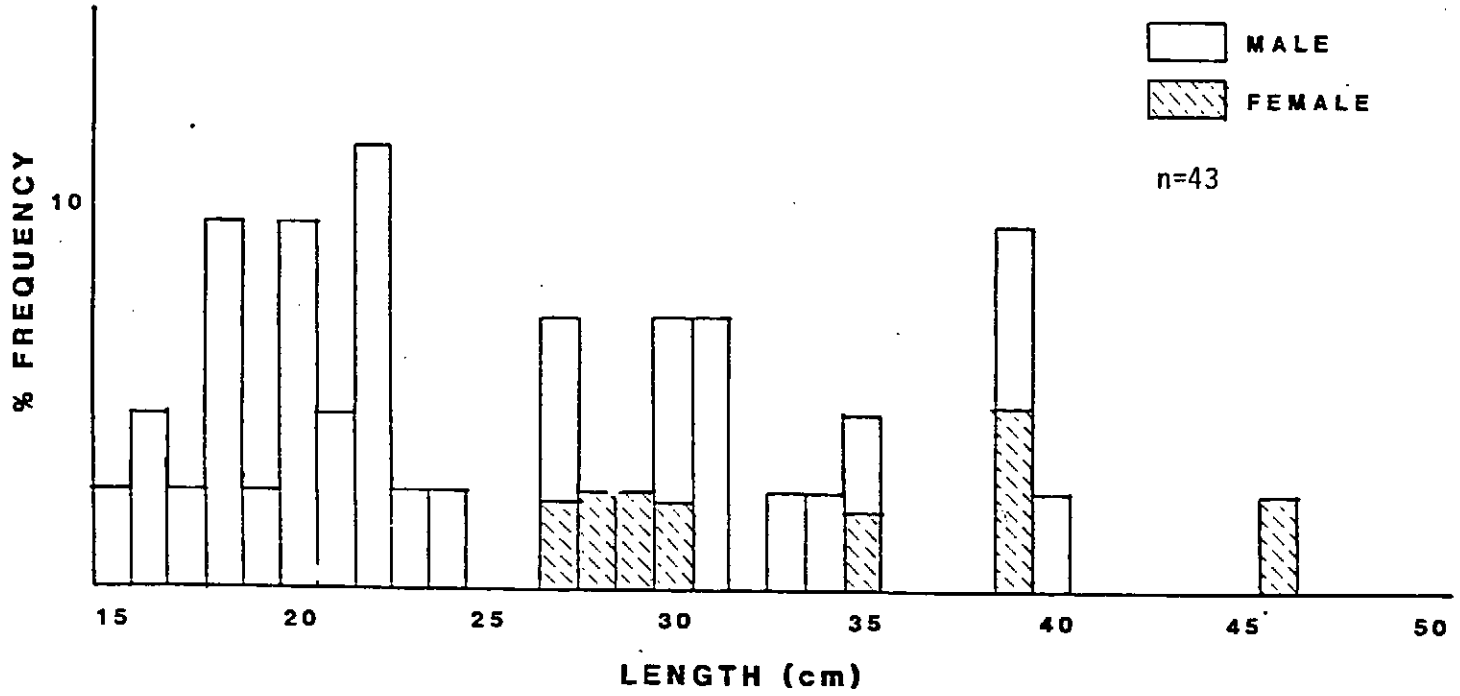


Figure 13. Length frequencies of rainbow trout spawners sampled in Warm River, 1985.

upstream from Polebridge campground, but too few interviews were obtained (only 1.2 hours) to adequately estimate catch rate and harvest (Tables 18 and 19).

Bait fishing was the most popular angling method in all sections, used by 58.7% of all anglers interviewed. Fly fishing was second in popularity, used by 31.3% of anglers interviewed. Anglers using lures represented 10.1% of interviewed anglers. Some anglers alternately used more than one type of terminal gear (Table 19).

DISCUSSION

Fish Sampling

Average lengths of trout in sections sampled in 1984 were similar with those found in 1983 (Spateholts and Moore 1985). Larger mean lengths for both rainbow and brown trout were observed in Robinson Creek than in any other water sampled. As previously mentioned, YOY were not sampled until at least August; therefore, average mean lengths of fish in transects WR1 and WR2 decreased when these fish were included in October, November and March samples. Length frequencies dominated by smaller and younger fish may indicate that these areas are important rearing areas for brown and rainbow trout. Neve and Moore (1981) found this relationship to be true for brook trout and cutthroat trout in tributaries to the Blackfoot River, Idaho.

The mean length of rainbow trout in the Henrys Fork study section has shown a steady decline since 1973. Sampled mean lengths in 1973, 1976, 1981 and 1984 were 284 mm, 254 mm, 243 mm and 198 mm, respectively (Coon 1977, Rohrer 1983). These lengths are smaller than those found in the Henrys Fork below Ashton Reservoir (291 mm), and from the Harriman Ranch to the Buffalo River (322 mm) (Rohrer 1983). While a creel census has not been conducted on the study section since 1981, increased angler effort and harvest may be responsible for the decrease. Present regulations in this section are six trout, only two over 405 mm, with no gear restrictions. It may be necessary to consider more conservative regulations to increase the average size of trout available to anglers.

Species composition in transects sampled may reflect dispersal of brown trout following plants as well as differences in habitat. Brown trout in Warm River occurred in greatest numbers at transects WR1 and WR2, where close to 115,000 fry were planted between 1981 and 1983. In other areas of Warm River, brown trout made up less than 5% of the trout population; plants in these areas have totaled approximately 16,500 fry from 1980 to 1982. WR1 and WR2 have moderate to low gradient, pool-run structure with good instream cover, overhanging banks and vegetation-gravel substrate. These features characterize optimal brown trout riverine habitat (Raleigh et al. 1984a). Conversely, many of the upper reaches of Warm River are characterized by steep gradient, cascade pools, shallow riffles, boulder-gravel substrate and cover and little overhanging banks. The failure of brown trout to become established in the upper reaches may be a result of lack of suitable habitat.

As in Warm River, brown trout in Robinson Creek have become well established where the bulk of the plants have occurred, primarily in RC4 and RC5 (102,000 and 26,500 fry, respectively). These transects are of moderate gradient with deep, slow water, undercut banks, abundant instream cover, and gravel and cobble substrate. Downstream areas, where species composition is at least 50% wild rainbow, are primarily deep pools and fast riffles, with larger cobble and boulder substrate and little overhanging vegetation and debris cover. Brown trout prefer stable flow and temperature regimes (Raleigh et al. 1984b). Transects that contained good brown trout populations were free of anchor and surface ice during December, probably due to the influence of springs. Other areas had a large amount of ice. Distribution of brown trout in Robinson Creek may then be a result of intensity of plants, but also of a combination of instream habitat and temperature preferences.

The species composition of trout sampled in the Henrys Fork may reflect efficiency of sampling gear. Brown trout in the Missouri River were sampled most efficiently during night electrofishing (Ron Spoon, Montana Department of Fish, Wildlife and Parks, pers. comm.). This would be too dangerous on the Henrys Fork. Brown trout fry were abundant during October sampling. Whether these fish were from 1984 plants or from natural reproduction is unknown.

Age and Growth

Mean lengths at annulus for rainbow trout in upper Warm River and Robinson Creek were smaller than those of fish sampled in the Henrys Fork during this study and others (Table 20). The mean length at annulus for rainbow in the Henrys Fork below Warm River showed a decline in all age groups from those sampled in 1980 (Rohrer 1981). Mean lengths at annulus for brown trout in all waters sampled (except Wyoming Creek) were smaller than those found in other studies (Table 21). The large mean length at annulus II for Wyoming Creek could be due to the very low abundance of fish in this stream, minimizing competition for resources. These fish were from fry plants made in 1981.

Salmonid Abundance

Cover is an important component in trout streams. It is provided by overhanging and submerged vegetation, undercut banks, instream rocks, logs and debris, pool depth and surface turbulence (Giger 1973). Boussa (1954) increased the number and weight of trout in streams by providing artificial brush cover. A cover area of >15-25% of total stream area for rainbow trout and >15-35% for brown trout has been proposed as adequate for these species (Raleigh et al. 1984a, Raleigh et al. 1984b). Salmonid abundance varied in transects sampled in Warm River and Robinson Creek. Species compositions in transects surveyed may correspond with species habitat preferences discussed previously. The

Table 20. Comparison of mean back-calculated lengths at annulus (mm) for rainbow trout from selected waters.

Location	Annulus I	II	III	IV	V	VI	VII	VIII	Reference
Kootenai River, MT	104	216	295	—	—	—	—	—	May & Huston (1983)
Fall River, ID	103	179	251	307	—	—	—	—	Spateholts & Moore (1985)
Henrys Fork, ID									
above Island Park Res.	111	217	322	391	488	546	—	—	Coon (1978)
Box Canyon to Last Chance	129	211	297	369	458	555	—	—	Rohrer (1983)
Warm River to Wendell bridge	113	191	259	317	349	—	—	—	Present study
Warm River									
lower	108	185	251	283	346	369	399	—	Present study
upper	107	160	199	217	223	—	—	—	
Robinson Creek	96	145	203	240	299	322	317	—	Present study

Table 21. Comparison of mean back-calculated lengths at annulus (mm) for brown trout from selected waters.

Location	Annulus I	II	III	IV	V	VI	VII	VIII	Reference
Little Deschutes R., OR	76	124	172	219	287	357	378	—	Lorz (1974)
Browns Creek, OR	102	190	296	397	469	517	591	—	Lorz (1974)
Missouri River, MT	100	207	305	388	461	—	—	—	Kathrien (1951)
West Gallatin River, MT	94	225	336	406	483	—	—	—	Purkett (1951)
South Fork Snake River, ID	97	233	372	453	550	589	—	—	Moore & Schill (1984)
Cellars Creek, ID	95	202	298	329	—	—	—	—	Corsi (1984)
Cranes Creek, ID	127	243	348	412	446	—	—	—	Corsi (1984)
Lower Willow Creek, ID	100	171	255	334	402	459	487	528	Corsi (1984)
Warm River, ID	109	171	252	317	372	417	467	—	Present study
Robinson Creek, ID	105	155	214	258	285	287	—	—	Present study
Wyoming Creek, ID	115	212	269	—	—	—	—	—	Present study
Henrys Fork, ID	109	181	256	322	374	—	—	—	Present study

abundance could then be influenced by differences in habitat as well. Although the amount of cover was not measured, it appeared abundance was greater in transects with more cover.

Bustard and Narver (1975) found that young salmonids occupy different habitats in winter than in summer in streams subject to harsh winter conditions. Log jams and rubble provided the most important winter cover. An increase in population estimates in the fall in WR3 and WR4 by 600% and 200%, respectively, as well as a two- to three-fold increase in RC2 and RC3 in September 1983 surveys when compared to August 1984 counts may be due to movement into winter habitat. Bjornn (1971) indicated that movement during or preceding winter did not occur if sufficient winter cover was available locally. Much of Robinson Creek is subject to severe anchor and surface ice formation. While both brown and rainbow trout fry and juveniles have been observed to enter the substrate when temperatures of 4 to 8 C occur, older fish prefer deeper water and streamside cover (Hartman 1963, Everest 1969). Areas that are kept ice free by spring influence as well as the deep pools in both Robinson Creek and Warm River may be important for the winter survival of salmonids in these systems.

Fish Movement and Migration

While most recapture data showed little or no movement in 1984, the size of brown and rainbow trout spawners present in Warm River indicates that these fish may be moving up from Ashton Reservoir and the Henrys Fork to spawn in Warm River. Tag returns showed that Henrys Fork rainbow trout may move to Ashton Reservoir during the winter. Additional information is necessary to establish these relationships.

Studies addressing emigration of brown trout from nursery streams suggest that juveniles spend one to three years in nursery streams before emigration to lochs or larger streams during increased stream discharge (Thorpe 1974, Runnstrom 1952). Research involving stream populations have found little movement by fish. Solomon and Templeton (1976) noted a slight downstream movement of brown trout fry after emergence and little movement by adults except for spawning migrations. They postulated that sections of stream suitable for spawning, rearing and adult growth located in close proximity were responsible for lack of movement. Based on the low mean length of brown trout found in lower Warm River and the large size of spawners, the lower Warm River may be a rearing area for brown trout, with some resident fish present. Larger mean lengths and many size classes of brown trout in Robinson Creek may indicate that these fish are primarily residents.

Lower Warm River contains rainbow trout with low mean length and younger age classes. Adfluvial juvenile rainbow have been found to emigrate from nursery areas at age 1 or 2 in Great Lakes tributaries during April-July (Biette et al. 1981, Stauffer 1972, Kwain 1983). Rainbow trout in a headwater stream of Bothell Creek, Canada, emigrated at age 1 during spring runoff (Alexander and MacCrimmon 1974). Larger mean length and more age classes present in upper Warm River and lower Robinson Creek indicate these fish are probably residents.

Population estimates and length frequencies were obtained prior to runoff in lower Warm River. A post-runoff estimate will be made to determine if any size and age classes emigrated during runoff.

Since the weir was essentially inoperable most of the time, it is impossible to make any comparisons between timing and size of trout caught. Tag returns in 1985 may prove to be valueable in determining if Warm River serves as a rearing area for Henrys Fork rainbow and brown trout.

Trout Spawning Activity

While aerial surveys were helpful in determining location of spawning activity, ground surveys were best for enumerating redds made by brown trout. Lower Warm River appears to be an important spawning area for brown trout from the Henrys Fork as no redds were observed in the Henrys Fork. Spawning occurred at temperatures reported in the literature (Mansell 1966). Aerial surveys conducted in March and April of 1980 in the Henrys Fork from Ashton Dam to Warm River found no rainbow trout redds (Rohrer 1981). Counts made in Warm River in 1983, 1984 and 1985 indicate that the lower Warm River is an important rainbow trout spawning area.

Warm River Creel Census

Although we did not record whether anglers were Idaho residents or nonresidents, we noted that most anglers we interviewed were residents of southeast Idaho. Many mentioned that they used the area every year, and many had come to the area primarily to cut wood. Total angler effort, especially from nonresident anglers, was probably reduced somewhat on Warm River in 1984 due to bridge construction on the Mesa Falls Scenic Drive (State Highway 47). However, even if effort were to increase, total effort per kilometer of streams would be relatively low compared to other waters in the region (Table 22).

Since much of the effort on Warm River is concentrated in areas of easy access (Warm River campground, Warm River Springs, Polebridge campground), localized overharvest may occur, and supplemental plants of hatchery rainbow trout are necessary to maintain good catch rates under a consumptive yield management regime. Return to creel of the 9,455 catchable rainbow planted in Warm River in 1984 was 19.3% (1,826 fish). Brown trout comprised only 6% of the total harvest, but the largest trout checked in 1984 was a 375 mm brown trout caught at the Warm River campground. In areas of limited access, effort and harvest are light, and wild rainbow and brook trout are relatively unexploited.

Table 22. Comparison of angler effort/km and catch/km for Warm River and other rivers and streams in Region 6.

Water	Year	Area	Section length (km)	Angler effort (hrs/km)	Number of fish/km			Source
					Harvested	Released	Total	
Warm River	1984	Highway 47 to Pineview	28.1	284.6	140	176	327	
Henrys Fork	1980	Saint Anthony to Warm River	38.2	1,016	415	610	1,025	Rohrer 1981
Henrys Fork	1982	Riverside campground to Island Park Dam	26.0	2,727	22	2,131	2,153	Rohrer 1984
Teton River	1980	All	171.7	466	233	99	332	Jeppson 1981
South Fork Snake	1982	Heise to Palisades Dam	64.7	998	388	327	616	Moore & Schill 1984
Birch Creek	1982	Reno Ditch to Above Kaufman Guard Station	29.1	805	751	1,103	1,854	Corsi et al. 1983
Medicine Lodge Creek	1982	Indian Creek to Divide Creek	20.0	266	287	17	304	Corsi et al. 1983

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FEDERAL AID TO FISH AND WILDLIFE RESTORATION

Job Performance Report

Project F-69-R-3

STREAM FLOW INVESTIGATIONS

Job II. Stream Resource Maintenance Flow Determinations on Idaho Streams

Period Covered: 1 July 1977 to 28 February 1978

by

Tim Cochnauer
Senior Fishery Research Biologist

and

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Biological Aide

June, 1978

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JOB PERFORMANCE REPORT

State of Idaho

Project No. F-69-R-3

Job No. II

Name: STREAM FLOW INVESTIGATIONS

Title: Stream Resource Maintenance Flow Determinations in Idaho Streams

Period Covered: 1 July 1977 to 28 February 1978

ABSTRACT

Fish and wildlife resources and stream resource maintenance flow recommendations are listed for Grouse Creek, Lightning Creek, Little Wood River, Big Wood River, Malad River, Portneuf River, the main Snake River from American Falls Reservoir upstream, Henrys Fork Snake River, Henrys Lake Outlet, Buffalo River, Warm River, Fall River, Teton River, Bitch Creek and South Fork Snake River. The flow recommendations were determined by correlating fish and wildlife biological criteria with physical flow parameters predicted by the U.S. Bureau of Reclamation Water Surface Profile (Pseudo) computer program.

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OBJECTIVES

To determine stream resource maintenance flows for the Snake River above American Falls Reservoir and to include the major tributaries in that section (Henrys Fork and South Fork).

TECHNIQUES USED

Stream resource maintenance flow recommendations were determined by use of the U. S. Bureau of Reclamation water surface profile computer program as presented in Idaho Fish and Game Resource Maintenance Flow Studies, 1976 (Cochnauer 1976).

Fish rearing flow recommendations are determined by the relationship of the wetted perimeter and discharge (Cochnauer and White 1975). The quantity of water for rearing (food production) was selected at the inflection point of the curve where wetted perimeter increases slowly while the discharge increases rapidly (Appendix, Figs. 1-38).

Stalnaker and Arnette (1976) list a range of velocities and minimum depths for fish spawning. In an attempt to provide adequate spawning criteria for a range of fish sizes of a given species and different fish populations, the listed criteria for this study (Table 1) are averages of the criteria presented by Stalnaker and Arnette. Usable spawning widths over a range of flows are determined by totaling the segment widths of a spawning transect which meet both velocity and depth criteria for a given species. The recommended spawning flows are designated at 80% of the total available spawning habitat for each study section, and incubation flows are two-thirds of the recommended spawning flows (Thompson 1972).

Table 1. Spawning criteria for fish species in study streams.

Species	Velocity cm/s	Velocity fps	Depth cm	Depth in
Rainbow trout	34-39	1.1-2.9	15	5.6
Cutthroat trout	24-79	0.8-2.6	12	4.7
Brook trout	9-64	0.3-2.1	12	4.7
Brown trout	31-70	1.0-2.3	17	6.8
Kokanee salmon	20-65	0.66-2.1	12	4.7
Chinook salmon	34-95	1.1-3.1	24	10.0
Steelhead trout	34-92	1.1-3.0	20	8.0
Dolly Varden	34-64	1.1-2.1	20	8.0

Stream resource maintenance flow methodologies for wildlife are more poorly known than those for fish. Along the Snake River and tributaries, furbearers and waterfowl are of as much concern as are fish. The furbearers inhabiting the study streams are dependent on riparian habitat for food, shelter, etc, and on aquatic organisms for food. The stream resource maintenance flows recommended for fish are assumed to be adequate to provide

riparian habitat and food organisms for furbearers.

An important consideration in the recommendation of stream resource maintenance flows in the upper Snake River drainage is the freezing of smaller streams at low flows. Instream methodologies do not provide guidelines regarding reduced flows and freezing. Until techniques become available, a stream resource maintenance flow equaling the natural flow will be recommended on critical streams during periods (December through February) when freezing could be expected.

Henrys Fork Snake River and South Fork Snake River have been designated as critical waterfowl nesting streams. Geese and some ducks utilize the many islands of each of these streams for nesting during the spring. Stream resource maintenance flow recommendations for waterfowl are based on maintaining the integrity of these islands. A low flow may render the island a part of the mainland thereby subjecting the nesting adults, unhatched eggs and juveniles to increased harassment by humans, livestock and predators. A high flow may result in flooding of established nests or cause breeding pairs to nest in less suitable locations, or not at all.

Initially, South Fork Snake River was designated as a waterfowl nesting study stream, but due to the complexity of the islands at known waterfowl nesting areas no reliable data were collected. Recommendations for desired waterfowl nesting flows on South Fork have been made in previous studies and will be utilized in this report.

Study site HFHP on Henrys Fork Snake River was located on a known nesting site subject to annual flooding. Elevation of the island was determined and designated as the maximum allowable water level during the nesting period (Appendix, Fig. 28). Minimum water surface level to maintain the island integrity was determined from the channel graph. The minimum and maximum water surface elevations were related to predicted discharges to determine minimum and maximum flows during the nesting period.

Extreme fluctuation of flows probably do have an adverse impact on fish and wildlife resources but have not been identified in this report. Fluctuations of flows within the defined minimum and maximum recommendations are assumed not to be detrimental to the populations.

Fish and wildlife resources are listed for each stream or stream section in Table 2. Stream resource maintenance flows are presented for life history phases of each species (Appendix, Table 12). Periodicity charts for fish and wildlife life history phases are given in Appendix, Tables 2-11. Flows are recommended for each month on the basis of the highest minimum flow for all species in each stream section and the lowest maximum flow where waterfowl are concerned. New flow recommendations for these streams may be made in future report when circumstances warrant (new or improved methodologies, changes in species compositions, etc.).

Table 2. Important fish and wildlife resources in study streams.

Stream	Kamloops trout	Rainbow trout	Cutthroat trout	Brook trout	Brown trout	Dolly Varden	Steelhead trout	Chinook salmon	Kokanee salmon	Mountain whitefish	Smallmouth bass	Canada goose	Mallard duck	Beaver	Muskrat	Otter	Mink
Grouse Creek	X		X	X		X			X	X				X	X		
Lightning Creek	X		X	X		X			X	X				X	X		
Lemhi River																	
Leadore to Big Springs Creek		X	X	X		X	X	X		X	X			X	X	X	X
Tendoy to mouth		X	X	X		X	X	X		X			X	X	X	X	X
Little Wood River																	
Silver Creek to Dietrich Diversion		X		X	X					X			X		X		
Dietrich Diversion to mouth		X		X	X					X	X		X		X		
Big Wood River																	
Warm Springs Creek to Bellevue Diversion		X		X	X					X	X	X	X	X	X		X
Malad River																	
Gooding to Idaho Power Diversion Dam		X		X							X				X		
Portneuf River			X		X							X	X	X	X	X	X

Table 2. Important fish and wildlife resources in study streams. (Continued)

Stream	Rainbow trout	Cutthroat trout	Brook trout	Brown trout	Kokanee	Mountain whitefish	Canada goose	Mallard duck	Beaver	Muskrat	Otter	Mink					
Henrys Fork Snake River Henrys Lake Outlet	X	X	X		X	X	X		X	X		X					
Big Springs to Island Park	X	X	X		X	X	X	X	X	X		X					
Island Park Dam to Warm River	X	X	X			X	X		X	X		X					
Warm River to Fall River	X	X	X		X	X	X		X	X		X					
Fall River to Teton River	X					X	X		X	X		X					
Teton River to South Fork Snake River	X	X				X	X		X	X		X					
South Fork Snake River to Palisade Dam to Henrys Fork River	X	X		X		X	X	X	X			X					
Henrys Fork/South Fork Snake River Confluence to Idaho Falls	X	X		X		X	X	X	X		X	X					
Snake River, Idaho Falls to American Falls Dam	X	X				X	X	X	X			X					
Buffalo River	X		X					X			X	X					
Warm River	X		X			X		X	X	X		X					
Fall River	X		X			X		X	X	X		X					
Teton River	X	X	X			X		X	X	X	X	X					
Bitch Creek	X	X	X			X			X	X		X					

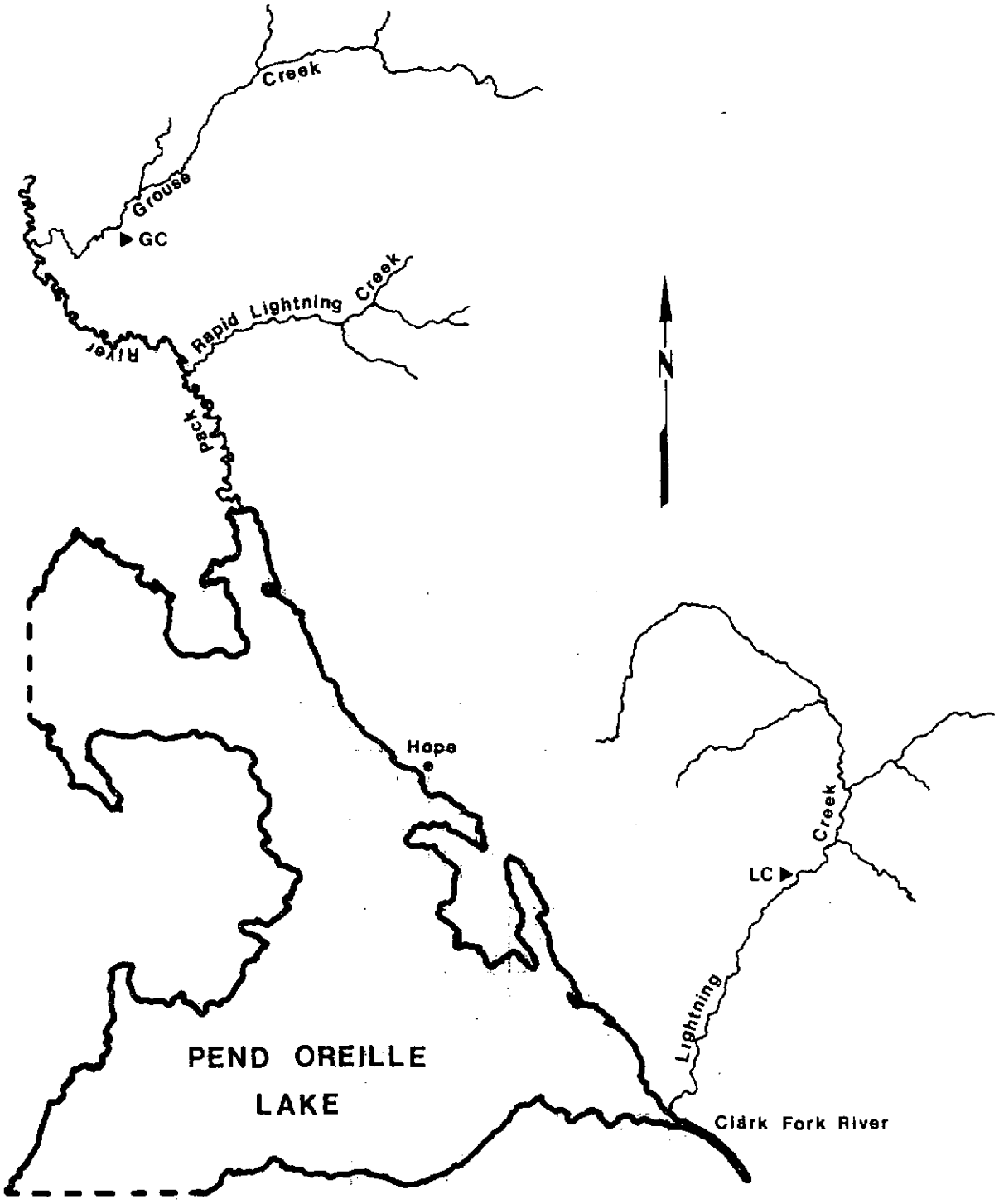


Figure 1. Locations of Grouse Creek and Lightning Creek study sites.

FINDINGS

Grouse Creek

Grouse Creek flows approximately 32 km (20 mi) to Pack River north of Pend Orielle Lake. This stream is one of the major trout spawning and rearing tributaries in north Idaho. Station GC is located on representative Kamloops spawning and food production habitat 5 km (3 mi) upstream from its confluence with Pack River (Fig. 1).

Game fish species include Kamloops trout, cutthroat trout, brook trout, Dolly Varden, kokanee salmon and mountain whitefish. The furbearers in this area include beaver and muskrat.

Stream resource maintenance flows, based on fish spawning, incubation and rearing requirements, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	0.4	0.4	0.4	2.4	2.4	1.6
Min. cfs	14	14	14	85	85	67

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	1.6	0.4	0.4	0.4	0.4	0.4
Min. cfs	67	14	14	14	14	14

Lightning Creek

Lightning Creek flows approximately 27 km (17 mi) from Darling Lake, its source, to its confluence with Clark Fork River near Clark Fork. This stream is the major spawning area for Pend Orielle Lake Kamloops trout. Station LC is located on representative spawning and food production habitat, 11 km (7 mi) upstream from its confluence with the Clark Fork River (Fig. 1).

Game fish species include Kamloops trout, cutthroat trout, brook trout, Dolly Varden, kokanee salmon and mountain whitefish. Furbearers in this area include beaver, muskrat and mink.

Stream resource maintenance flows, based on spawning, incubation and rearing requirements for all fish species, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	1.4	1.4	1.4	2.3	2.3	1.5
Min. cfs	49	49	49	81	81	53

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	1.5	1.4	1.4	1.4	1.4	1.4
Min. cfs	53	49	49	49	49	49

Little Wood River

The Little Wood River originates in the Sawtooth mountains and flows 170 km (107 mi) southwest where it flows into the Big Wood River west of Gooding (Fig. 2). The lower two-thirds of the river flows across the Snake River plain and is characterized by heavy aquatic vegetation covering a rubble and bedrock bottom.

Stream resource maintenance flows are recommended for stream sections between the mouth of Silver Creek and Dietrich diversion and from the diversion to Big Wood River. Station LWR (1) is located 14 km (8.8 mi) upstream of Richfield, station LWR (2) is located 9 km (5.7 mi) upstream of Richfield and station LWR (3) is located 10 km (6.3 mi) below Richfield (Fig. 2). These stations represent typical spawning and food production habitat.

Game fish populations include rainbow trout, brook trout, brown trout, mountain whitefish and smallmouth bass. The Little Wood River area is also used by mallard ducks and Canada geese for nesting.

Stream resource maintenance flows, based on fish rearing requirements, are as follows:

Silver Creek to Dietrich Diversion

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	1.1	1.1	1.1	1.1	1.1	1.1
Min. cfs	39	39	39	39	39	39

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	1.1	1.1	1.1	1.1	1.1	1.1
Min. cfs	39	39	39	39	39	39

Dietrich Diversion to Mouth

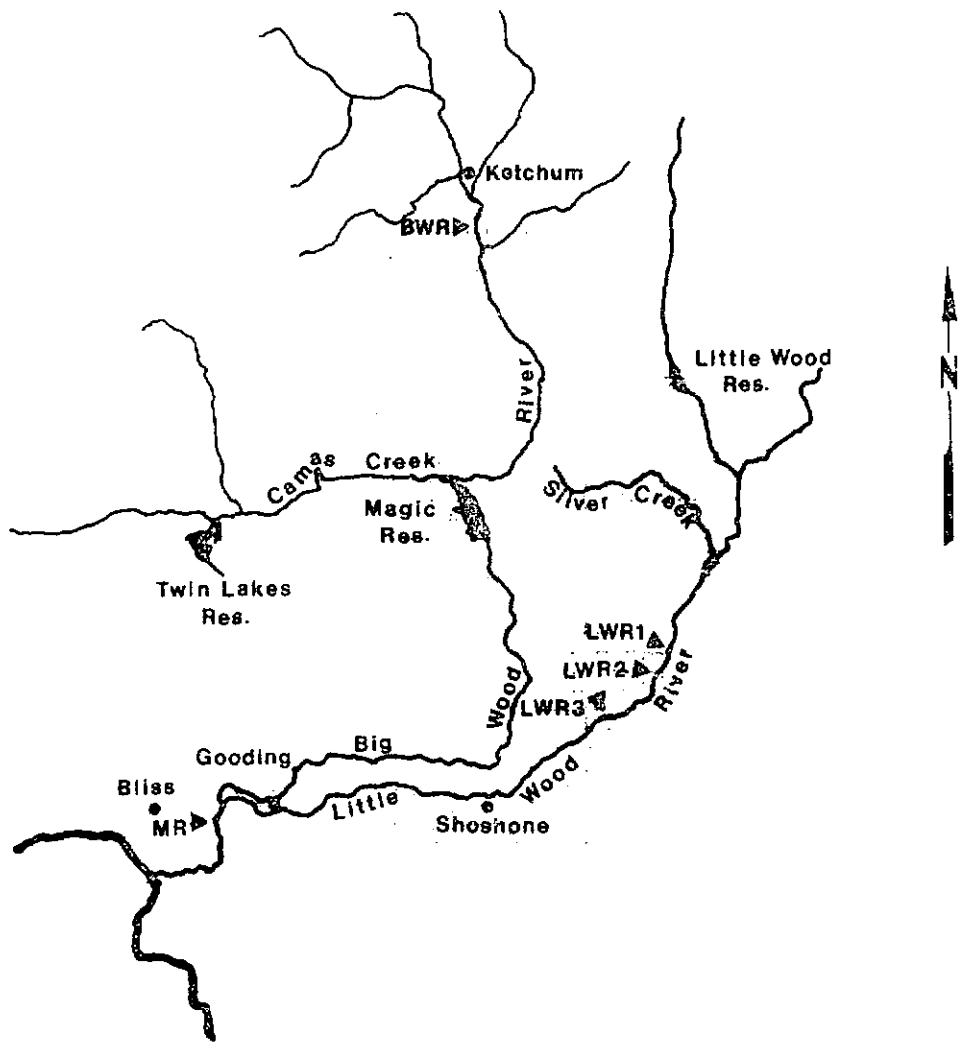
	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	0.7	0.7	0.7	0.7	0.7	0.7
Min. cfs	25	25	25	25	25	25

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	0.7	0.7	0.7	0.7	0.7	0.7
Min. cfs	25	25	25	25	25	25

Big Wood River

Big Wood River originates in the Sawtooth mountains 44 km (28 mi) upstream of Ketchum and flows 215 km (135 mi) to its confluence with the Little Wood River (Fig. 2).

Figure 2. Locations of Malad River, Big Wood River and Little Wood River study sites.



Station BWR is located on representative food production habitat above the mouth of East Fork Big Wood River (Fig. 2). Stream resource maintenance flows are recommended for the stream section between the mouth of Warm Springs Creek to Bellevue diversion.

Game fish populations include rainbow trout, brook trout, brown trout, and mountain whitefish. A variety of waterfowl (mallard ducks and Canada geese) utilize the big Wood River drainage. Furbearing species include beaver, mink and muskrat.

Stream resource maintenance flows, based on fish food habitat are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	2.0	2.0	2.0	2.0	2.0	2.0
Min cfs	70	70	70	70	70	70
	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	2.0	2.0	2.0	2.0	2.0	2.0
Min cfs	70	70	70	70	70	70

Malad River

Malad River is formed by the confluence of Big Wood River and Little Wood River 8 km (5 mi) west of Gooding, Idaho. It then flows approximately 18 km (11 mi) to its confluence with Snake River near Hagerman (Fig. 2). Station MR is located on representative fish food production habitat 400 m (437 yd) below Highway 20 bridge, southwest of Gooding (Fig. 2).

Game fish populations include rainbow trout and smallmouth bass.

Stream resource maintenance flows, based on food production habitat, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	1.7	1.7	1.7	1.7	1.7	1.7
Min. cfs	60	60	60	60	60	60
	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	1.7	1.7	1.7	1.7	1.7	1.7
Min. cfs	60	60	60	60	60	60

Lemhi River

Lemhi River originates in the Salmon National Forest west of Leadore and flows 97 km (60 mi) northwest into the Salmon River near Salmon (Fig. 3). Lemhi River tributaries receive runoff water from the Lemhi and Beaverhead mountain ranges.

Stream resource maintenance flows are recommended for stream sections from Leadore to Big Springs Creek and from Tendoy to the mouth. Station LBC is located above the mouth of Big Springs Creek and Station LR is located

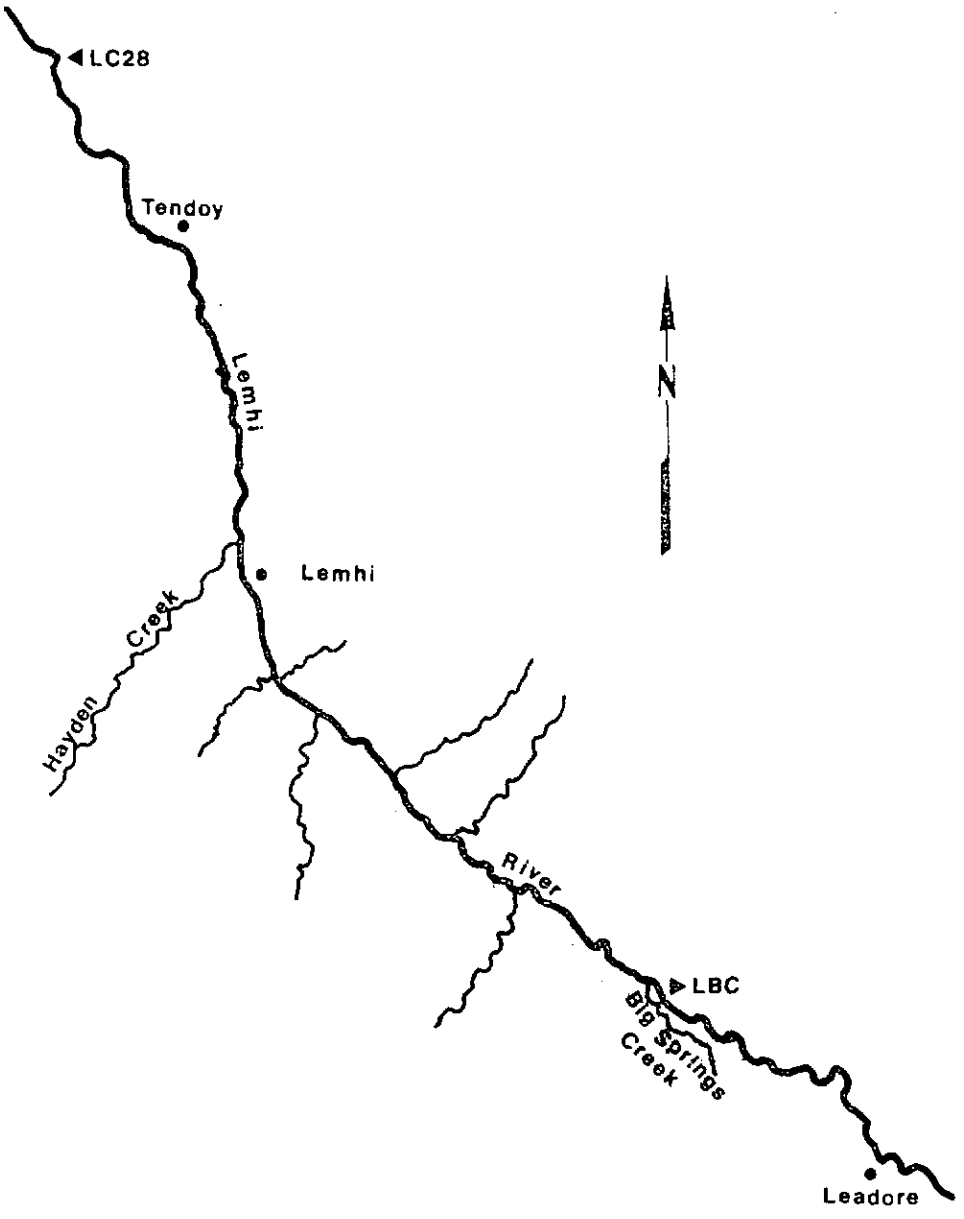


Figure 3. Locations of Lemhi River study sites.

near Club 28 (Fig. 3). Both stations encompass representative spawning and fish food production habitat.

Game fish populations include rainbow trout, cutthroat trout, brook trout, Dolly Varden, steelhead trout, chinook salmon and mountain whitefish. This stream provides excellent spawning habitat for both steelhead trout and chinook salmon.

During 1971 through 1976, the annual spring chinook salmon redd count averaged 376 (Hoss, et al. 1976). The 1977 Lemhi River count totaled 463 redds from Leadore, Idaho to the mouth (Kent Ball, personal communication).

A variety of waterfowl, including mallard ducks and Canada geese, utilize the Lemhi River drainage for nesting and rearing of young. Furbearers inhabiting this region include beaver, muskrat, mink and otter.

Stream resource maintenance flows, based on spawning and rearing requirements, are as follows:

Leadore to Big Springs Creek

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	1.3	1.3	1.3	1.9	1.9	1.9
Min. cfs	46	46	46	67	67	67

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	1.3	1.9	1.9	1.9	1.3	1.3
Min. cfs	46	67	67	67	46	46

Tendoy to Mouth

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	4.0	4.0	4.0	4.0	4.0	4.0
Min. cfs	141	141	141	141	141	141

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	4.0	4.0	4.0	4.0	4.0	4.0
Min. cfs	141	141	141	141	141	141

Portneuf River

Portneuf River originates in the Caribou National Forest 40 km (25 mi) east of Pocatello, Idaho. It flows 140 km (88 mi) from its headwaters to American Falls Reservoir (Fig. 4). The lower portion near Pocatello is concrete-line. Agricultural lands comprise a large portion of the drainage and irrigation return flows decrease the streams water quality, especially in the lower reaches. The lower stream section has a poor fishery due to

the reduced water quality.

Station PR is located on representative food production habitat, approximately 15 km (9 mi) downstream of Lava Hot Springs (Fig. 4). Stream resource maintenance flows are recommended for the stream section from the Portneuf diversion to the mouth of Marsh Creek.

Major game fish populations include cutthroat trout and brown trout. Fishing is described as fair upstream of Lava Hot Springs.

The Portneuf River drainage is an important waterfowl nesting area, especially above Lava Hot Springs and downstream from Pocatello to American Falls Reservoir. The entire area is extensively used during spring and fall waterfowl migration periods. Some portions are also utilized as wintering areas for ducks and geese.

Mink, beaver and muskrat are the furbearers inhabiting the drainage.

Stream resource maintenance flows, based on brown trout spawning and fish food production, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	0.2	0.2	0.2	0.2	0.2	0.2
Min. cfs	7	7	7	7	7	7

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	0.2	0.2	0.2	0.3	0.3	0.2
Min. cfs	7	7	7	11	11	7

Henrys Lake Outlet

Henrys Lake Outlet originates at Henrys Lake (Fig. 1) and flows south to its confluence with Big Springs to form Henrys Fork Snake River. The stream flows for approximately 14.5 km (9 mi), and is characterized by willow shrouded banks and gravel/silt bottom with some aquatic vegetation. Station HLO was located approximately 4 km (2.5 mi) upstream of the mouth. At times the flow release from the lake is reduced to zero. Regeneration of the flow occurs throughout the stream length and results in flows greater than 1.1 cu m/s (40 cfs) at the mouth. Most of the flow regeneration occurs in the last 10 km (6 mi) of the stream length.

The game fish populations include rainbow trout, brook trout, cutthroat trout, mountain whitefish and kokanee salmon. During the period, 1971-1975, angler success was 1.06 trout per hour (Jeppson, personal communications). Wildlife populations include beaver, muskrat and mink. Some Canada geese nest on the meadow bordering the stream.

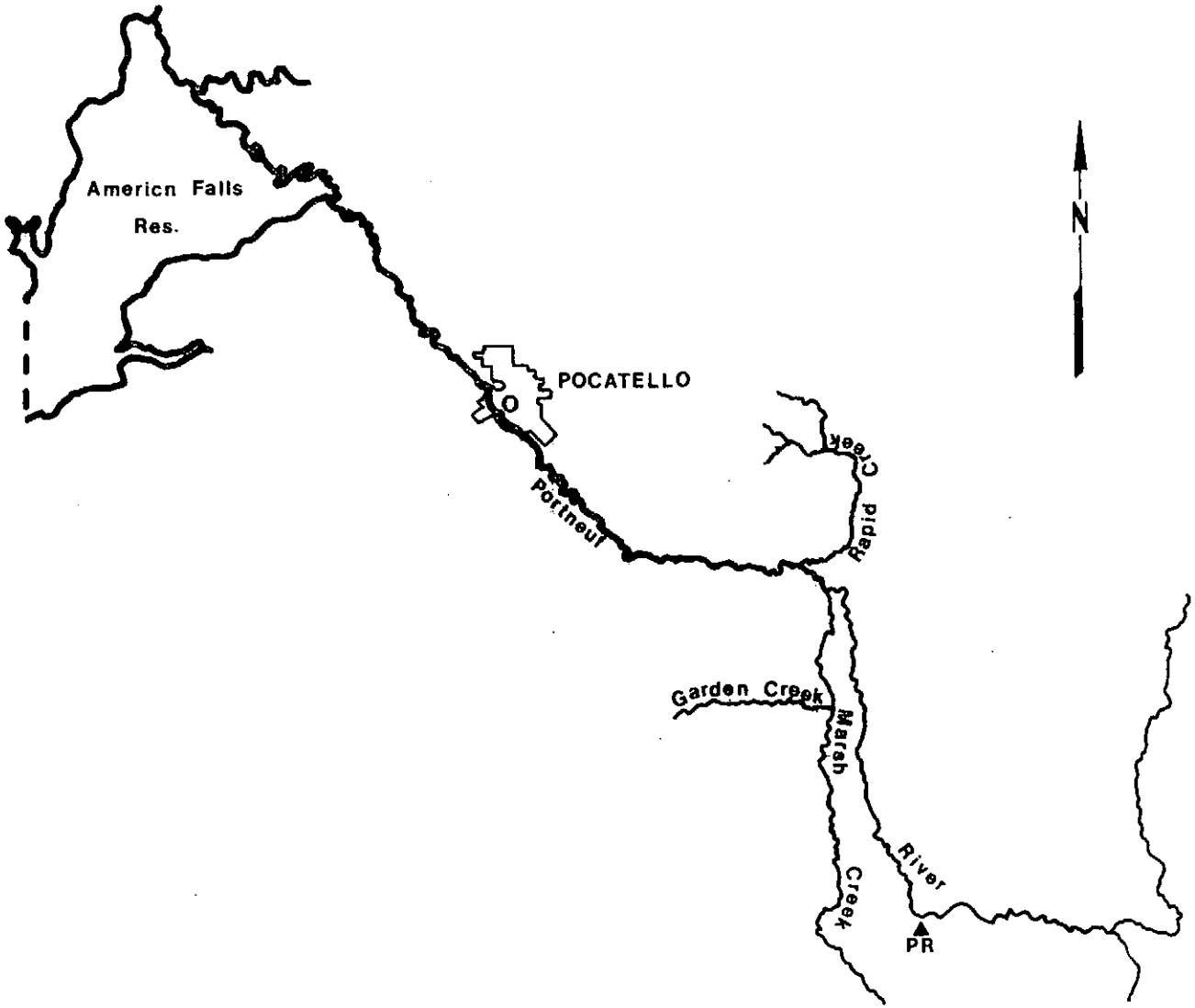


Figure 4. Location of Portneuf River study site.

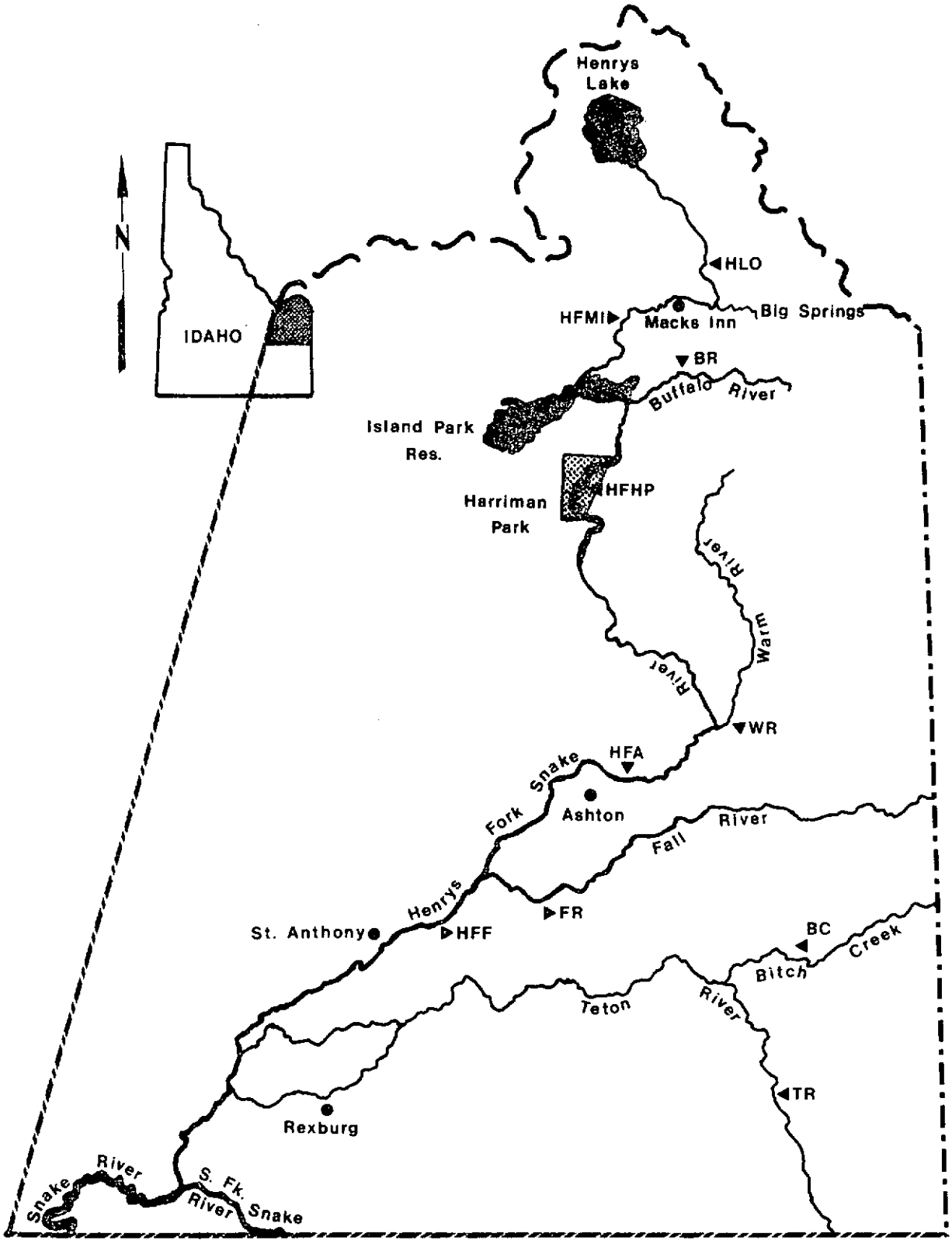


Figure 5. Locations of Henrys Fork Snake River and tributaries study sites.

The stream resource maintenance flow recommendations are for that stretch of stream from Forest Service Road 059 to the mouth. The flow recommendations based on fish rearing, fish spawning and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		0.9	0.9	0.9	0.6
Min. cfs	Natural flow		32	32	32	21

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min cu m/s	0.4	0.4	0.55	0.4	0.4	Natural flow
Min. cfs	14	14	18	14	14	Natural flow

Henrys Fork Snake River

Henrys Fork Snake River originates at the confluence of Henrys Lake Outlet and Big Springs, and flows for approximately 111 km (69 mi) to South Fork Snake River near Menan, Idaho (Fig. 1). From Chester downstream there are numerous irrigation diversions. The major tributaries are Buffalo River, Warm River, Fall River and Teton River.

Henrys Fork supports an excellent fishery, which includes rainbow trout, brook trout, cutthroat trout and mountain whitefish. Kokanee salmon are in the river upstream of Island Park Reservoir. The following information summarized creel census data collected during 1976 (Coon 1976).

River section	Angler hours	Trout harvested	Trout harvest per hour
Big Springs to Island Park Res.	54,586	35,870	0.66
Island Park Res. to Warm River	67,220	22,559	0.34
Warm River to Ashton	13,781	8,083	0.59
Ashton to St. Anthony	34,393	21,542	0.63

Wildlife populations include beaver, mink, otter, Canada goose, various ducks, trumpeter swan and moose. The stream stretch below Island Park Dam provides excellent waterfowl nesting habitat and important wintering area for geese. Several islands located within the Harriman State Park are utilized extensively by geese during the nesting season. The average number of Canada goose nests in the park for the period 1970-77 is 17. The 1973 Idaho Department of Fish and Game winter waterfowl inventory indicated that 571 Canada geese, 549 trumpeter swans and approximately 5,000 ducks wintered below Island Park Reservoir.

The four study stations were located on representative fish rearing habitat at the following locations: Station HFHP, 5.5 km (3.4 mi) downstream of Island Park Reservoir; HFA, 500 m (547 yd.) upstream of the Wendell bridge; Station HFF, 6.5 km (4 mi) upstream of St. Anthony.

Station HFHP was located on waterfowl nesting habitat and waterfowl flows were determined from predicted discharges at channel configuration elevations (Appendix, Fig. 8). The recommended maximum flow (38.2 cu m/s) is the maximum flow which should be maintained through Harriman State Park. A flow of 38.2 cu m/s released at Island Park Dam would result in greater than desired flows during the waterfowl nesting season. Depending on the amount of inflow to Henrys Fork Snake River between Island Park Dam and Harriman Park, the releases from the dam should be adjusted to result in a flow not greater than 38.2 cu m/s at Harriman State Park.

The stream resource maintenance flow recommendations, based on fish rearing, fish spawnning, waterfowl nesting and prevention of freezing, are as follows:

Railroad Trestle Bridge to Island Park Reservoir

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		7.4	7.4	7.4	5.0
Min. cfs	Natural flow		261	261	261	177

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	4.25	4.25	4.25	4.25	4.25	Natural flow
Min. cfs	150	150	150	150	150	Natural flow

Island Park Dam to Warm River

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	5.0	5.0	7.1	7.1	7.1	5.0
Min. cfs	177	177	250	250	250	177

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	5.0	5.0	5.0	5.0	5.0	5.0
Min. cfs	177	177	177	177	177	177

Through Harriman State Park

	Mar.	Apr.	May
Max. cu m/s	38.2	38.2	38.2
Max. cfs	1,350	1,350	1,350

Warm River to Fall River

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	8.0	8.0	8.0	8.0	8.0	8.0
Min. cfs	282	282	282	282	282	282

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	8.0	8.0	8.0	8.0	8.0	8.0
Min. cfs	282	282	282	282	282	282

Fall River to South Fork Snake River

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	12.0	12.0	12.0	12.0	12.0	12.0
Min. cfs	424	424	424	424	424	424

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	12.0	12.0	12.0	12.0	12.0	12.0
Min. cfs	424	424	424	424	424	424

Buffalo River

Buffalo River originates in the Targhee National Forest southeast of Mack's Inn (Fig. 1), and flows for approximately 13 km (8 mi) into Henrys Fork Snake River downstream of Island Park Reservoir. Station BR was located on representative rearing habitat, 0.6 km (0.4 mi) upstream of the mouth.

The stream supports a high quality fishery with the major species being rainbow trout and brook trout. Wildlife populations include beaver, mink and otter.

Stream resource maintenance flow recommendations are for the stretch of Buffalo River from Highway 20/191 bridge to the mouth. The recommendations, based on fish rearing, fish spawning and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		0.67	3.80	3.80	3.80
Min. cfs	Natural flow		24	134	134	134

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	2.55	2.55	0.65	1.00	1.00	Natural flow
Min. cfs	90	90	23	35	35	Natural flow

Warm River

Warm River originates as springs along the base of the Moose Creek Plateau in the Targhee National Forest (Fig. 1), and flows for approximately 35 km (22 mi) into Henrys Fork Snake River at the town of Warm River. Station WR was located on representative fish rearing habitat, 50 m (55 yd) downstream of Robinson Creek.

The stream supports viable game fish populations and is relatively clear and unpolluted throughout most of its length. Game fish include rainbow trout, brook trout and mountain whitefish. Sparse populations of waterfowl and furbearers are found along Warm River.

Stream resource maintenance flow recommendations are for the Warm River stretch from Highway 47 bridge to the mouth. These recommendations, based on fish rearing and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		4.0	4.0	4.0	4.0
Min. cfs	Natural flow		141	141	141	141

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	4.0	4.0	4.0	4.0	4.0	Natural flow
Min. cfs	141	141	141	141	141	Natural flow

Fall River

Fall River originates in Yellowstone Park and flows for approximately 100 km (62 mi) into Henrys Fork Snake River near St. Anthony (Fig. 1). Station FR was located 1.6 km (1 mi) upstream of the Highway 20/191 bridge.

Major game fish species in Fall River include rainbow trout, brook trout and mountain whitefish. Wildlife populations include beaver, mink, muskrat and a variety of ducks.

Stream resource maintenance flow recommendations are made for the stretch of stream from Highway 32 bridge to the mouth. These recommendations based on fish rearing and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		4.0	4.0	4.0	4.0
Min. cfs	Natural flow		140	140	140	140

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	4.0	4.0	4.0	4.0	4.0	Natural flow
Min. cfs	140	140	140	140	140	Natural flow

Teton River

Teton River (Fig. 1) has its headwaters in the Targhee National Forest southeast of Victor and flows north and west for approximately 129 km (80 mi) into Henrys Fork Snake River near Rexburg. Near St. Anthony, the stream divides into the North Fork and South Fork, and enters Henrys Fork at two points 8 km (5 mi) apart. The Teton Dam was constructed near Newdale. On 5 June 1976, the earth-filled structure collapsed, resulting in the degradation of the stream below the dam site. Station TR was located approximately 300 m (328 yd) downstream of Highway 33 bridge.

Game fish populations include mountain whitefish, brook trout, rainbow trout and cutthroat trout. A study on Teton River (Irving, et al. 1977) found that on the stream above Bitch Creek, anglers fished 17,464 hours to harvest 25,442 game fish in 1974 and 18,097 hours to harvest 28,887 game fish in 1975.

Wildlife populations include mink, muskrat, beaver, otter and a variety of waterfowl. The stream in the Teton Basin above Bitch Creek supports a significant population of nesting waterfowl.

The stream resource maintenance flow recommendations are for the section of river from Highway 33 bridge to Bitch Creek. These recommendations, based on fish rearing and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		3.0	3.0	3.0	3.0
Min. cfs	Natural flow		106	106	106	106

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	3.0	3.0	3.0	3.0	3.0	Natural flow
Min. cfs	106	106	106	106	106	Natural flow

Bitch Creek

Bitch Creek, a major tributary of Teton River, originates in the Targhee National Forest east of St. Anthony and flows for approximately 40 km (25 mi) into the Teton River (Fig. 1). Station BC was located approximately 300 m (328 yd) downstream of Highway 32 bridge.

Game fish populations in the stream include rainbow trout, cutthroat trout, brook trout and mountain whitefish. Irving, et al. (1977) found that in 1974 anglers fished an estimated 1,184 hours to harvest 5,841 game fish of which 74% were cutthroat trout and in 1975 anglers fished an estimated 1,886 hours to harvest 3,809 game fish of which 66% were rainbow trout.

Wildlife populations include mink, muskrat, beaver and otter.

The stream resource maintenance flow recommendations are from Highway 32 bridge to the Teton River. The flow recommendations, based on fish rearing and prevention of freezing, are as follows:

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	Natural flow		0.8	0.8	0.8	0.8
Min. cfs	Natural flow		28	28	28	28

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	0.8	0.8	0.8	0.8	0.8	Natural flow
Min. cfs	28	28	28	28	28	Natural flow

South Fork Snake River

The South Fork Snake River (Fig. 2) drains approximately 1.5 x 10^6 ha (5,800 mi^2) of mountainous terrain which lies mostly in national forests and parks of western Wyoming. Approximately 95 km (59 mi) of the stream are in Idaho, and flows are controlled at Jackson Dam in Wyoming and Palisades Dam in Idaho.

The 11 km (7 mi) stretch of South Fork from Palisades Dam to Irwin is confined to one channel with long shallow runs and a few rapids and pools. The remaining 84 km (52 mi) are characterized by braided channels. From Anderson diversion to the mouth, 34 km (21 mi), most of the flow is diverted for irrigation and other water uses, resulting in dewatered channels from July to November.

Fish populations include cutthroat trout, brown trout and mountain whitefish. Jeppson (1970) estimated annual utilization and harvest by anglers in the 64 km (40 mi) of stream from Palisades Dam to Heise at 10,526 angler days, 34,186 hours of fishing, 16,011 cutthroat trout; 747 brown trout, 84 rainbow trout, 34 lake trout, 33 coho salmon, and 3,038 mountain whitefish.

Wildlife populations include beaver, mink, otter, Canada goose and a variety of ducks. Approximately 1,250 Canada geese and 4,500 ducks utilize the stream and surrounding area during the winter. From the dam to the stream mouth, there are approximately 260 islands situated either singly or in complexes and range in size from a few square meters to several hectares. The islands vary from low open gravel bars of changing characteristics at different water levels to large stable islands covered with vegetation. The nesting success of an important population of Canada goose is dependent on the large number of islands, and magnitude and timing of spring water releases from Palisades Reservoir. A summary of Idaho Department of Fish and Game Canada goose nesting surveys on South Fork Snake River from Palisades Dam to Burns Creek for a 5-year period (1972-1976) is presented below.

Table 3. Summary of Idaho Department of Fish and Game Canada goose nesting surveys on South Fork Snake River from Palisades Dam to Burns Creek, 1972-76.

	1972	1973	1974	1975	1976
Number of nests	108	82	128	96	79
Number of goslings	465	190	596	424	293

Studies by Idaho Department of Fish and Game (Merrill 1972; Parker 1973; DeShon 1976) indicate that the key factor in successful goose nesting on South Fork is the maintenance of an adequate flow regime during the nest selection period and nesting season.

From these studies a minimum nesting flow of 226 cu m/s is recommended to maintain island integrity and a maximum nesting flow of 453 cu m/s is recommended to prevent flooding during nest selection and incubation.

Station SRC was located on fish rearing habitat approximately 2.5 km (1.6 mi) downstream of Highway 26 bridge. Station SRAH was located on fish rearing habitat approximately 11 km (6.8 mi) upstream of the Heise Hot Springs bridge. Station SRBH was located 2 km (1.2 mi) downstream of the Heise Hot Springs bridge. Station SRTB was located approximately 400 m (437 yd) downstream of the Ririe-Archer Bridges.

The stream resource maintenance flow recommendations, based on fish rearing habitat and waterfowl nesting requirements, are as follows:

Palisades Dam to Ririe-Archer Bridges

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	30.7	30.7	226	226	226	30.7
Min. cfs	1,084	1,084	8,000	8,000	8,000	1,084

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	30.7	30.7	30.7	30.7	30.7	30.7
Min. cfs	1,084	1,084	1,084	1,084	1,084	1,084

	Mar.	Apr.	May
Max. cu m/s	453	453	453
Max. cfs	16,000	16,000	16,000

Ririe-Archer Bridges to Mouth

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	29	29	226	226	226	29
Min. cfs	1,024	1,024	8,000	8,000	8,000	1,024

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	29	29	29	29	29	29
Min. cfs	1,024	1,024	1,024	1,024	1,024	1,024

	Mar.	Apr.	May
Max. cu m/s	453	453	453
Max. cfs	16,000	16,000	16,000

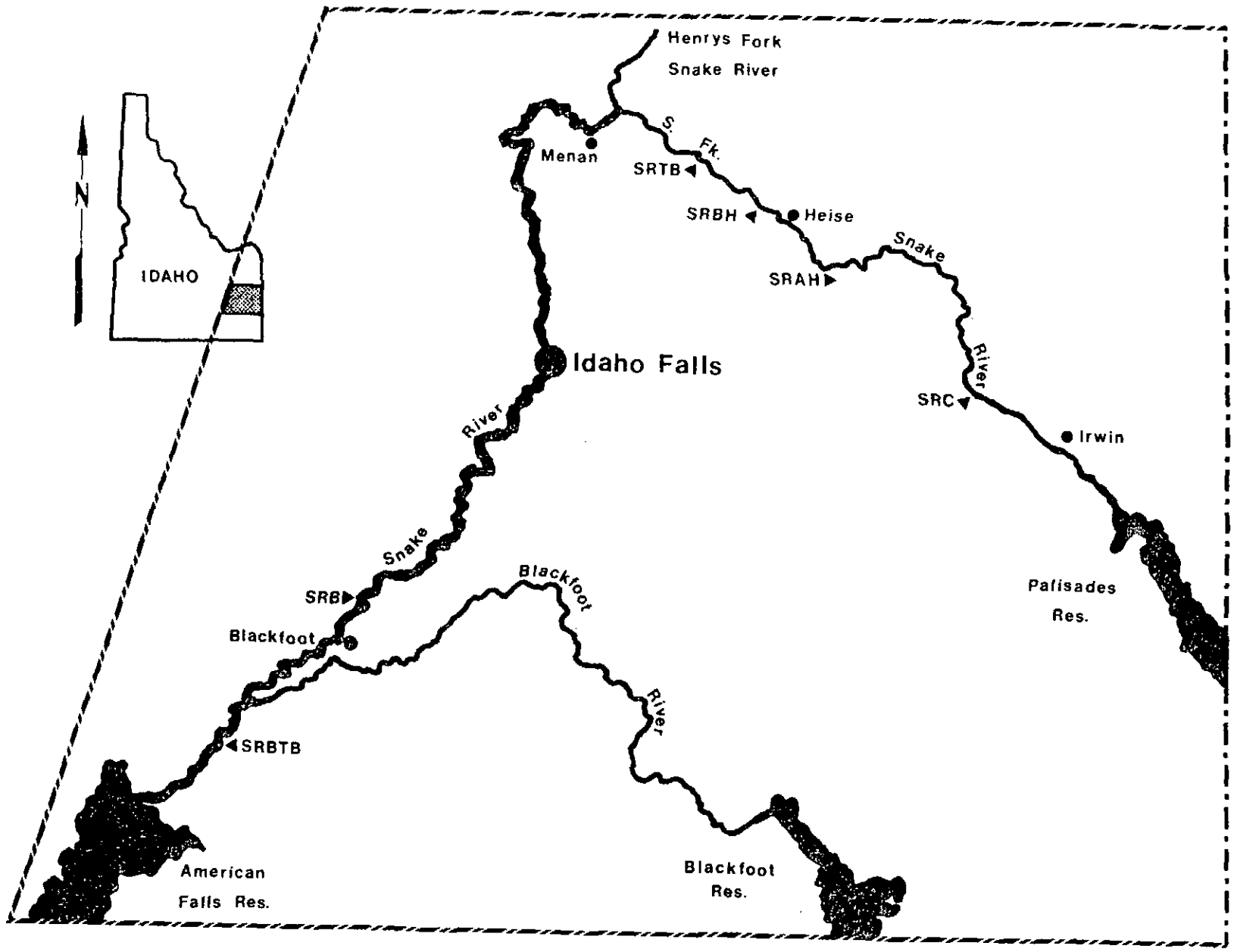


Figure 6. Locations of South Fork Snake River and main Snake River study sites.

Snake River (Menan to American Falls Reservoir)

The main Snake River is formed by the confluence of Henrys Fork Snake River and South Fork Snake River near Menan, Idaho. The stream at that point flows in a southwesterly direction for approximately 150 km (93 mi) into American Falls Reservoir (Fig. 2). This stretch of the river has poor water quality as a result of returned irrigation flows during certain times of the year. Many irrigation diversions are located along this section of the river.

Game fish populations include rainbow trout and cutthroat trout. Most rainbow trout are of hatchery origin and most of the cutthroat trout are wild fish. Wildlife populations include beaver, muskrat, mink, Canada goose and a variety of ducks.

Station SRBF, located on representative fish rearing habitat, was 200 m (219 yd) upstream of the Rose bridge. Station SRBTB, located on representative fish rearing habitat, was 600 m (656 yd) downstream of the Tilden bridge.

The stream resource maintenance flow recommendations, based on fish rearing requirements, are as follows:

South Fork Snake River to Blackfoot River

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	44	44	44	44	44	44
Min. cfs	1,550	1,550	1,550	1,550	1,550	1,550

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	44	44	44	44	44	44
Min. cfs	1,550	1,550	1,550	1,550	1,550	1,550

Blackfoot River to American Falls Reservoir

	Jan.	Feb.	Mar.	Apr.	May	June
Min. cu m/s	37.5	37.5	37.5	37.5	37.5	37.5
Min. cfs	1,325	1,325	1,325	1,325	1,325	1,325

	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min. cu m/s	37.5	37.5	37.5	37.5	37.5	37.5
Min. cfs	1,325	1,325	1,325	1,325	1,325	1,325

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A P P E N D I X

Table 1. Metric conversion table.

1 cubic foot per second (cfs) = 0.028 cubic meter per second (cu m/s)
1 cubic meter per second = 35.3 cubic feet per second
1 meter (m) = 3.28 feet (ft)
1 foot = 0.305 meter
1 foot per second (fps) = 30.77 centimeters per second (cm/s)
1 centimeter per second = 0.0328 feet per second
1 pound = 0.454 kilogram (kg)
1 kilogram = 2.20 pounds

Table 2. Grouse Creek fish periodicity chart.

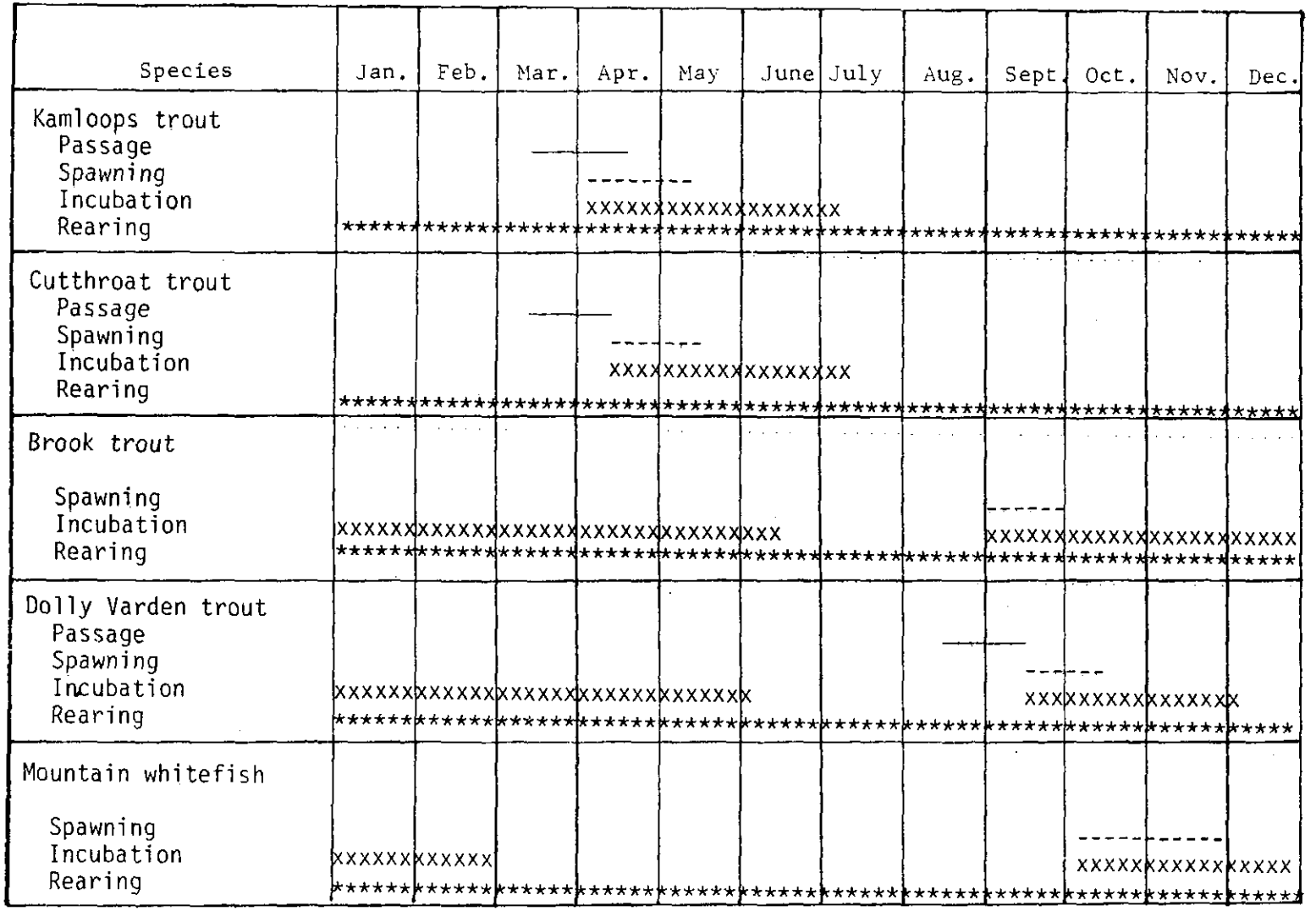


Table 3. Lightning Creek fish periodicity chart.

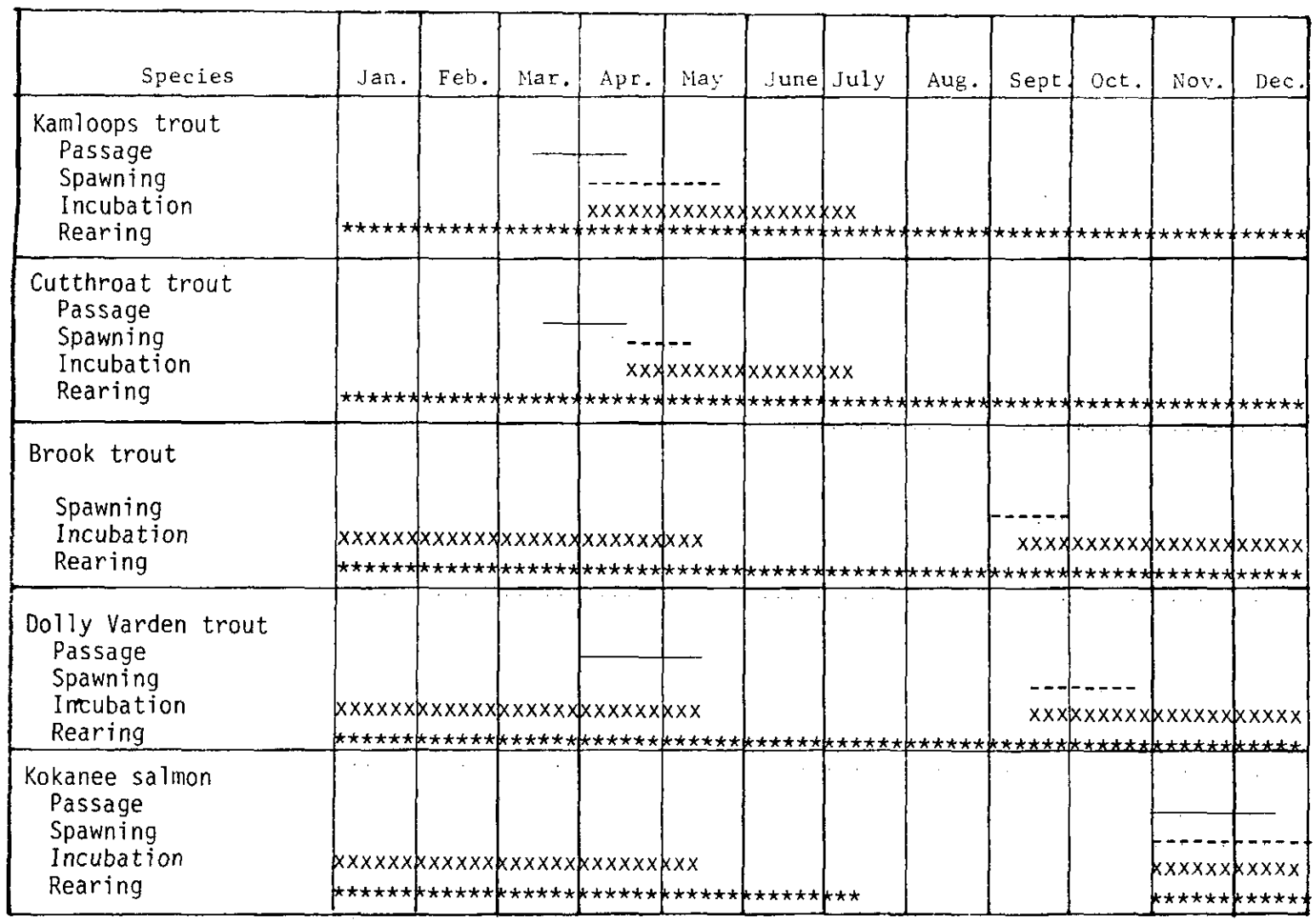


Table 4. Little Wood River fish periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Passage												
Spawning				-----	-----	-----	----			-----	-----	
Incubation	XXXXXXXX			XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX		XXXXXX	XXXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	*******
Brook trout												
Passage												
Spawning									-----	-----	-----	
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX					XXXXX	XXXXXX	XXXXXX	XXXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	*******
Brown trout												
Passage												
Spawning										---	-----	-----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXX						XXX	XXXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	*******
Mountain whitefish												
Passage												
Spawning	----------	-----									-----	-----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXX							XXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	*******
Smallmouth bass												
Passage												
Spawning				-----	-----	-----	-----					
Incubation				XXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	*******

Table 4. Little Wood River fish periodicity chart (Cont.).

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mallard duck Nest establishment Incubation				------ XXXXXX	------ XXXXXX	XXX						
Canadian goose Nest establishment Incubation			------ XXXXXX	------ XXXXXX	------ XXXXXX							

Table 5. Big Wood River (Warm Springs Creek to Bellevue Diversion) fish periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Passage												
Spawning				----	----	----	---			----	----	
Incubation	XXXXXXXX			XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Brook trout												
Passage												
Spawning									----	----	----	
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXX					XXXXX	XXXXX	XXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Brown trout												
Passage												
Spawning										---	----	----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX						XXX	XXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Mountain whitefish												
Passage												
Spawning	----	----									----	----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX							XXXXX	XXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********

Table 6. Malad River fish periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Passage												
Spawning				------	------	------	---			------	------	
Incubation	xxxxxxx			xxxxxx	xxxxxx	xxxxxx	xxxxxx	xxxxxx		xxxxxx	xxxxxx	xxxxxx
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Smallmouth bass												
Passage												
Spawning					------	------	------					
Incubation					xxxxxx	xxxxxx	xxxxxx	xxxxxx				
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********

Table 7. Lemhi River fish periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Spawning				----	----	----						
Incubation				XXXXX	XXXXXX	XXXXXX	XXXXXX					
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Cutthroat trout												
Spawning					----	----						
Incubation					XXXXXX	XXXXXX	XXXXXX					
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Dolly Varden trout												
Spawning									----	----		
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX					XXXXXX	XXXXXX	XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Steelhead trout												
Passage	----	----	----	----					----	----	----	----
Spawning				----	----	----						
Incubation				XX	XXXXXX	XXXXXX	XX					
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Brook trout												
Spawning									----	----	----	
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXX					XXXXX	XXXXXX	XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******

Table 7. Lemhi River fish periodicity chart (Continued).

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chinook salmon												
Passage						———	———	———				
Spawning								---	---	---		
Incubation	XXXXX	XXXXXX	XXXXXX	XXXXXX				XXX	XXXXXX	XXXXXX	XXXXXX	XXXXX
Rearing	**********	**********	******									
Mountain whitefish												
Spawning	-----									----------	----------	----------
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXXX	XXXX					XXXXXX	XXXXXX	XXXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Mallard duck												
Nest establishment				———	———							
Incubation				XXXXXX	XXXXXX	XXXXXX						

Table 8. *Portneuf River fish periodicity chart.*

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cutthroat trout												
Spawning				------	------	------	------					
Incubation				XXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Brown trout												
Spawning										------	------	
Incubation	XXXXXX	XXXXXX								XXXXXX	XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Mallard duck												
Nest establishment				------	------							
Incubation				XXXXXX	XXXXXX	XXXXXX						
Canadian goose												
Nest establishment			------	------								
Incubation			XXXXXX	XXXXXX	XXXXXX							

Table 9. Henrys Lake Outlet and Henrys Fork Snake River fish and wildlife life history periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Spawning			------	------	------							
Incubation			XXXXXX	XXXXXX	XXXXXX	XXXXXX						
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Cutthroat trout												
Spawning			------	------	------							
Incubation			XXXXXX	XXXXXX	XXXXXX	XXXXXX						
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Brook trout												
Spawning											------	------
Incubation	XXXXXX	XXXXXX	XXXXXX								XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Kokanee												
Passage								------	------			
Spawning									------			
Incubation									XXXXXX	XXXXXX	XXXXXX	
Mountain whitefish												
Spawning											------	------
Incubation	XXXXXX	XXXXXX	XXXXXX								XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******

Table 9. Henrys Lake Outlet and Henrys Fork Snake River fish and wildlife life history periodicity chart (Continued).

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Canada goose Nest establishment Incubation			------	------ XXXXXX	XXXXXX							
Mallard duck Nest establishment Incubation				------ XXXXXX	------ XXXXXX	XXXXXX						

Table 10. Buffalo River, Warm River, Fall River, Teton River and Bitch Creek fish and wildlife life history periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Passage												
Spawning				------	------	----						
Incubation				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Cutthroat trout												
Passage												
Spawning				------	------	------						
Incubation				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Brook trout												
Passage												
Spawning										------	------	------
Incubation	XXXXXX	XXXXXX	XXXXXX							XXXXXX	XXXXXX	XXXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********
Mountain whitefish												
Passage												
Spawning										------	------	------
Incubation	XXXXXX	XXXXXX	XXXXXX							XXXXXX	XXXXXX	XXXXXX
Rearing	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********	**********

Table 11. South Fork Snake River and Snake River (above American Falls Reservoir) fish and wildlife life history periodicity chart.

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainbow trout												
Spawning				-----	-----	-----						
Incubation				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Cutthroat trout												
Spawning				-----	-----	-----						
Incubation				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX				
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Brown trout												
Spawning										-----	-----	-----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX						XXXXXX	XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Mountain whitefish												
Spawning										-----	-----	-----
Incubation	XXXXXX	XXXXXX	XXXXXX	XXXXXX						XXXXXX	XXXXXX	XXXXX
Rearing	******	******	******	******	******	******	******	******	******	******	******	******
Canada goose												
Nest establishment			-----	-----								
Incubation				XXXXXX	XXXXXX							

Table 11. South Fork Snake River and Snake River (above American Falls Reservoir) fish and wildlife life history periodicity chart (Continued).

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mallard duck Nest establishment Incubation				------	------ xxxxxx	xxxxx						

Table 12. Stream resource maintenance flow recommendations (*cu m/s*) for life history periods of important fish and wildlife resources in study streams.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Grouse Creek												
Kamloops trout												
Spawning				2.4	2.4							
Incubation				1.6	1.6	1.6	1.6					
All fish species												
Rearing	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Lightning Creek												
Cutthroat trout												
Spawning				1.8	1.8							
Incubation				1.2	1.2	1.2	1.2					
Kamloops trout												
Spawning				2.3	2.3							
Incubation				1.5	1.5	1.5	1.5					
All fish species												
Rearing	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Little Wood River												
Silver Creek to Dietrich Diversion												
All fish species												
Rearing	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Dietrich Diversion to Mouth												
All fish species												
Rearing	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Big Wood River												
Mouth to Warm Springs Creek to Bellevue Diversion												
All fish species												
Rearing	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

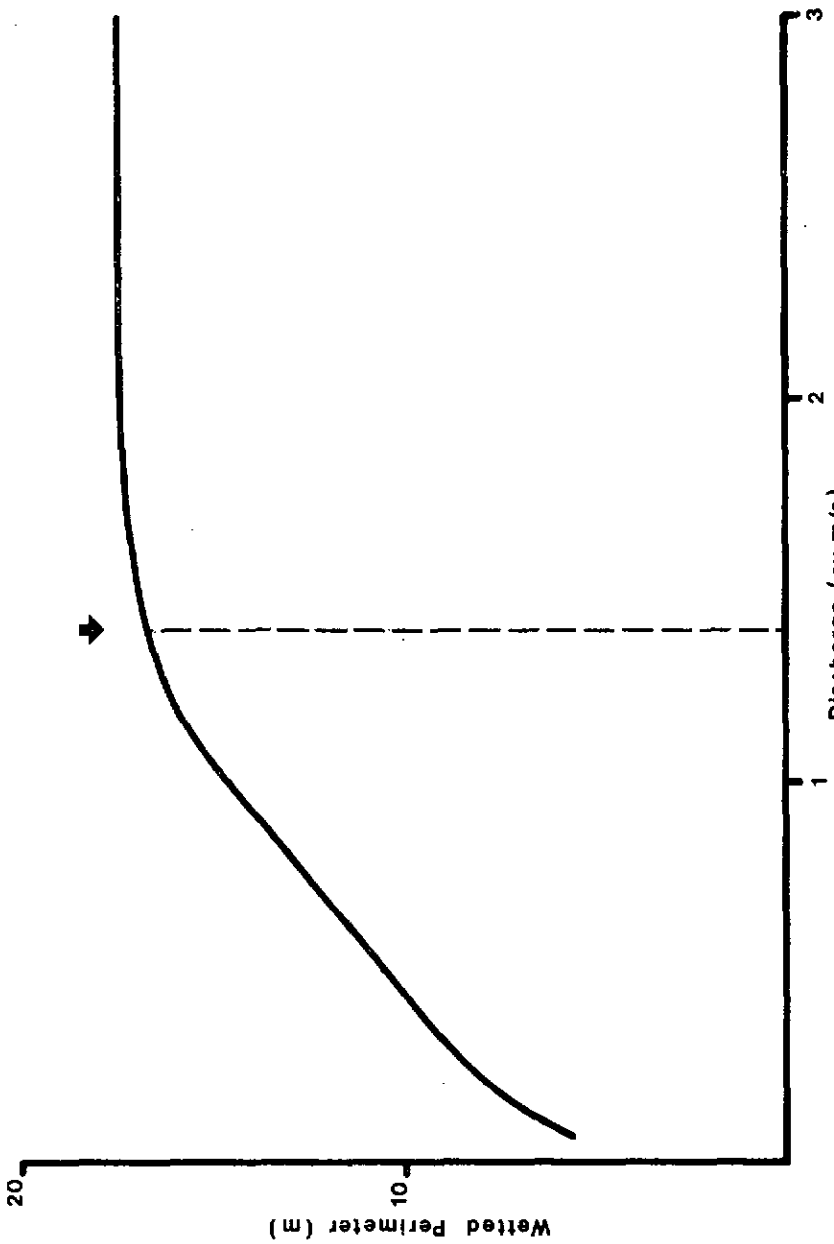


Figure 3. Rearing flow curve for Lightning Creek.

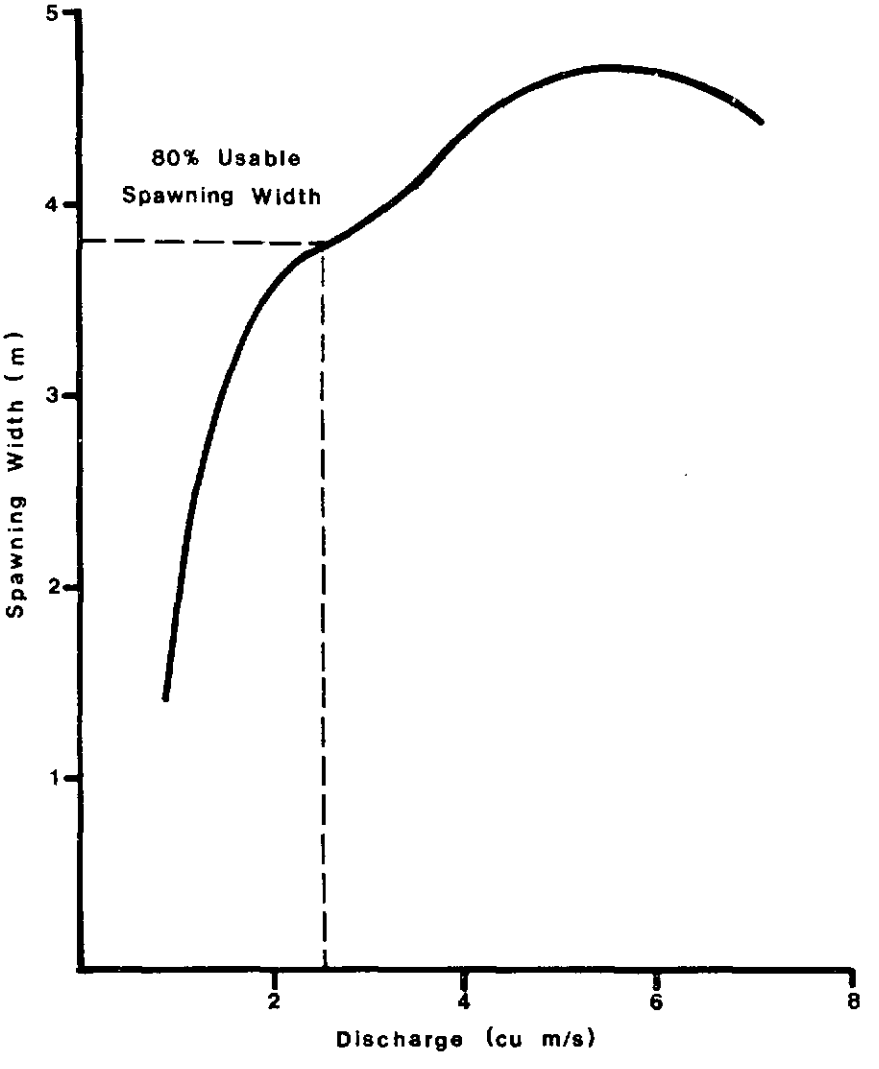


Figure 4. Kamloops trout spawning curve for Lightning Creek.

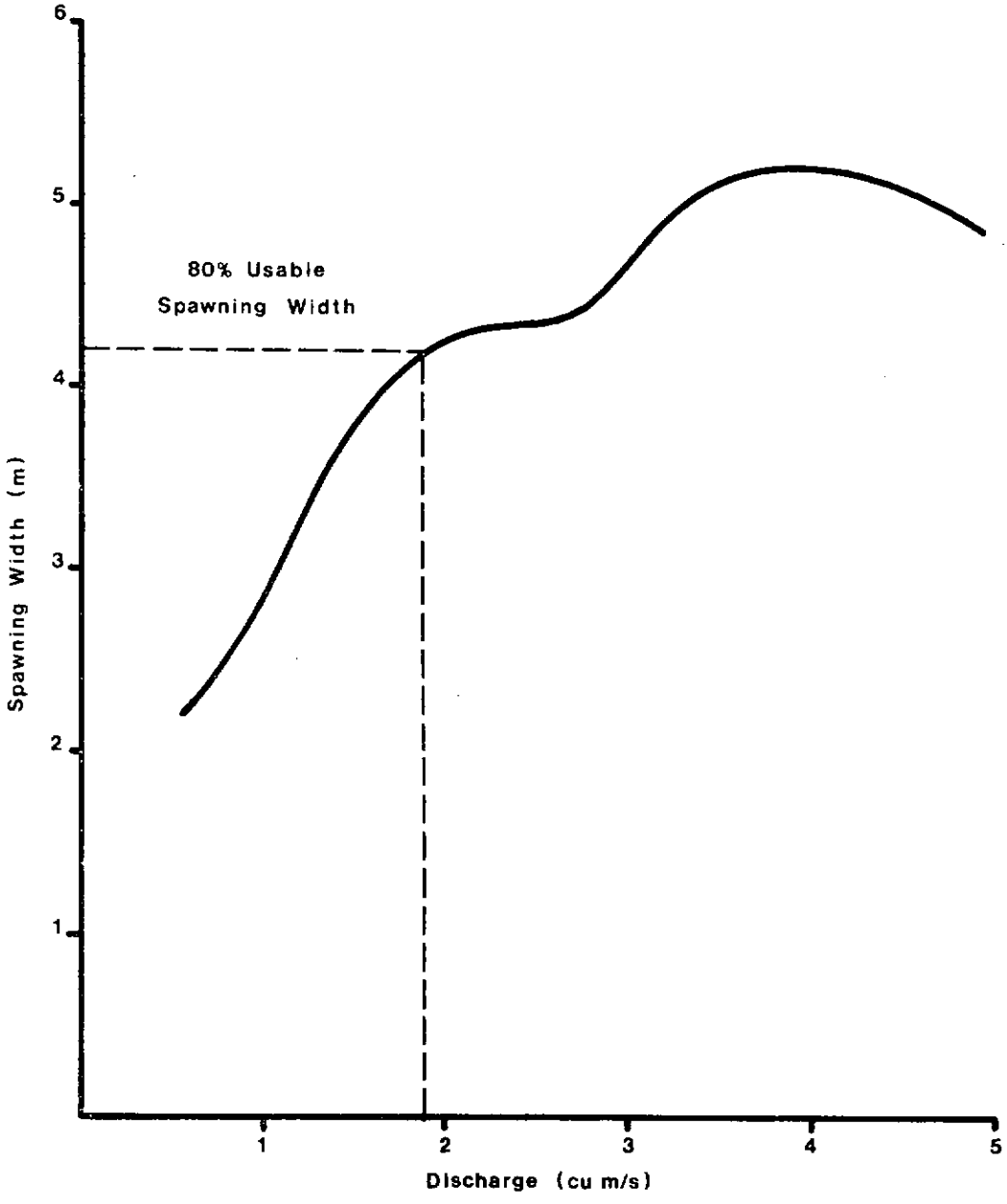


Figure 5. Cutthroat trout spawning curve for Lightning Creek.

Table 12. Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams (Cont.).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Malad River												
Gooding to Idaho Power Diversion Dam												
All fish species												
Rearing	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Lemhi River												
Leadore to Big Springs Creek												
Rainbow trout												
Spawning				1.8	1.8	1.8						
Incubation				1.2	1.2	1.2	1.2					
Cutthroat trout												
Spawning					1.4	1.4						
Incubation					1.0	1.0	1.0					
Brook trout												
Spawning									0.7	0.7	0.7	
Incubation	0.5	0.5	0.5	0.5					0.5	0.5	0.5	0.5
Dolly Varden												
Spawning									1.3	1.3		
Incubation	.8	.8	.8	.8					.8	.8	.8	.8
Steelhead trout												
Spawning				1.9	1.9	1.9						
Incubation				1.3	1.3	1.3	1.3					

Table 12. Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams (Cont.).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chinook salmon												
Spawning								1.9	1.9	1.9		
Incubation	1.3	1.3	1.3	1.3				1.3	1.3	1.3	1.3	1.3
All fish species												
Rearing	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Tendoy to mouth												
All fish species												
Rearing	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Portneuf River												
Portneuf Diversion to mouth of Marsh Creek												
Brown trout												
Spawning										0.3	0.3	
Incubation	0.2	0.2								0.2	0.2	0.2
All fish species												
Rearing	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 12. Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams. (Cont.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Henrys Lake Outlet												
Forest Service Road												
059 to mouth												
Rainbow trout												
Spawning			.90	.90	.90							
Incubation			.60	.60	.60	.60						
Kokanee												
Spawning									.55			
Incubation									.37	.37	.37	
All fish species												
Rearing	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40
Henrys Fork Snake River												
Railroad trestle bridge												
to Island Park Reservoir												
Rainbow trout												
Spawning			7.40	7.40	7.40							
Incubation			4.96	4.96	4.96	4.96						
All fish species												
Rearing	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
Island Park Dam to												
Warm River												
All fish species												
Rearing	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01
Waterfowl												
Nesting (min)			7.1	7.1	7.1							
(max)			38.2	38.2	38.2							
Incubation (min)			7.1	7.1	7.1							
(max)			38.2	38.2	38.2							

Table 12. (Cont.) Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Henrys Fork Snake River (cont.)												
Warm River to Fall River												
All fish species												
Rearing	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99	7.99
Fall River to South Fork Snake River												
All fish species												
Rearing	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01	12.01
Buffalo River												
Highway 20/191 bridge to mouth												
Rainbow trout												
Spawning				3.8	3.8	3.8						
Incubation				2.55	2.55	2.55	2.55	2.55				
Brook trout												
Spawning										1.0	1.0	1.0
Incubation	.67	.67	.67							.67	.67	.67
All fish species												
Rearing	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65	.65
Warm River												
Highway 47 bridge to mouth												
All fish species												
Rearing	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Fall River												
Highway 32 bridge to mouth												
All fish species												
Rearing	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0

Table 12. (Cont.) Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Teton River												
Highway 33 bridge to Bitch Creek												
All fish species Rearing	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Bitch Creek												
Highway 32 bridge to Teton River												
All fish species Rearing	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
South Fork Snake River												
Palisades Dam to Ririe-Archer Bridges												
All fish species Rearing	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30. 7	30.7	30.7	30.7	30.7
Waterfowl												
Nesting (min)			226	226	226							
(max)			453	453	453							
Incubation (min)			226	226	226							
(max)			453	453	453							
Ririe-Archer Bridges to mouth												
All fish species Rearing	29	29	29	29	29	29	29	29	29	29	29	29
Waterfowl												
Nesting (min)			226	226	226							
(max)			453	453	453							
Incubation (min)			226	226	226							
(max)			453	453	453							

Table 12. (Cont.) Stream resource maintenance flow recommendations (cu m/s) for life history periods of important fish and wildlife resources in study streams.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Main Snake River												
South Fork Snake River to Blackfoot River												
All fish species Rearing	44	44	44	44	44	44	44	44	44	44	44	44
Blackfoot River to American Falls Reservoir												
All fish species Rearing	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5

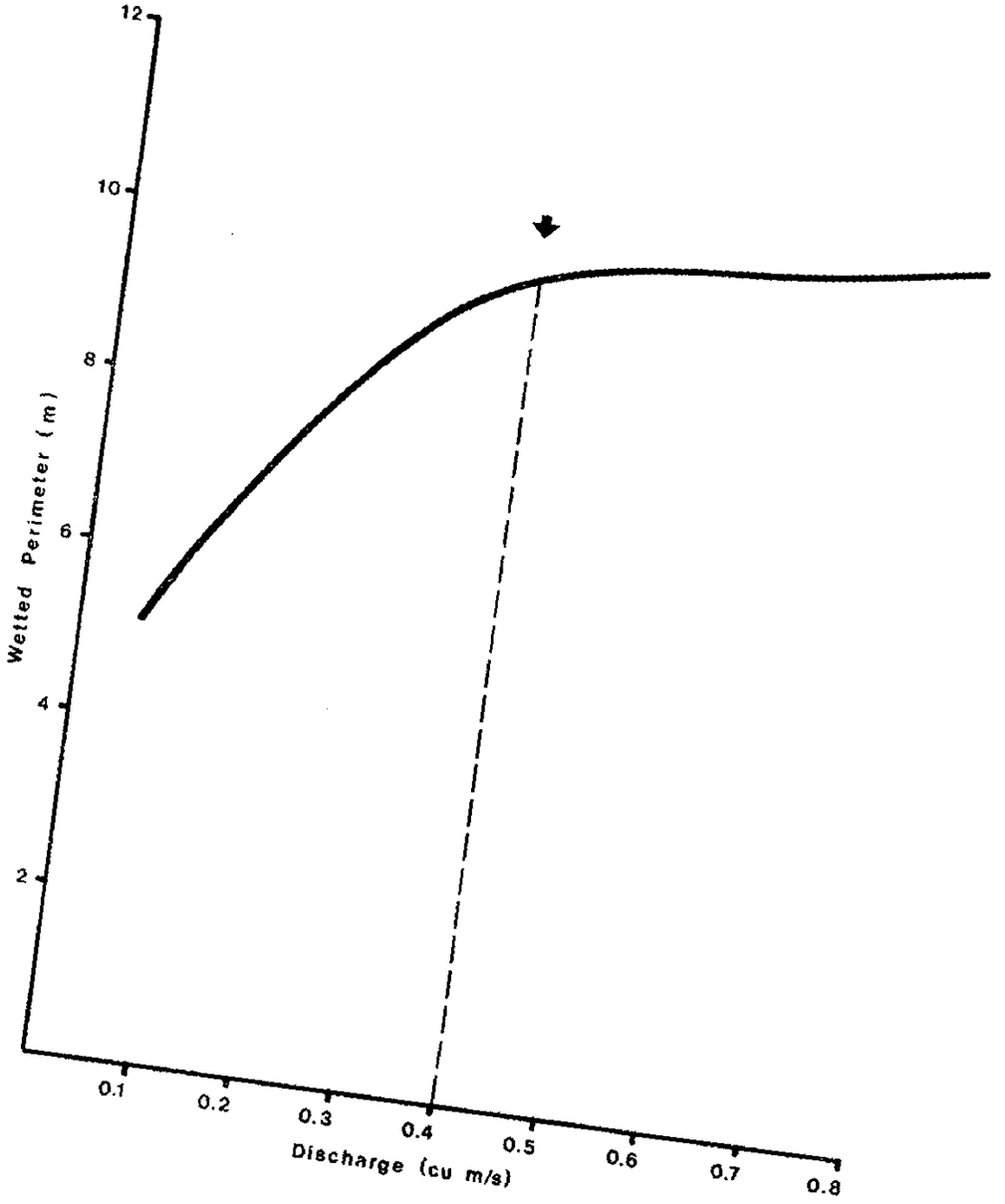


Figure 1. Rearing flow curve for Grouse Creek.

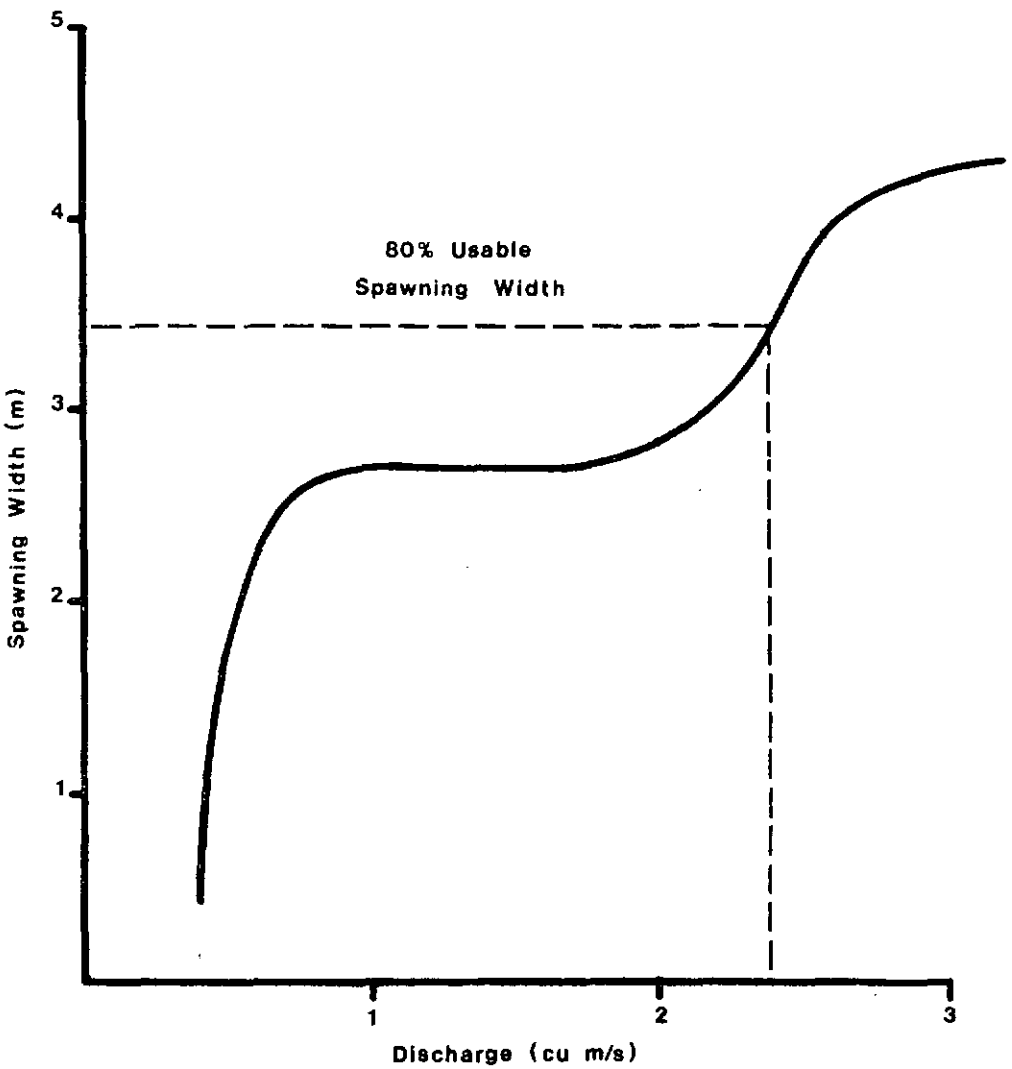


Figure 2. Kamloops trout spawning curve for Grouse Creek.

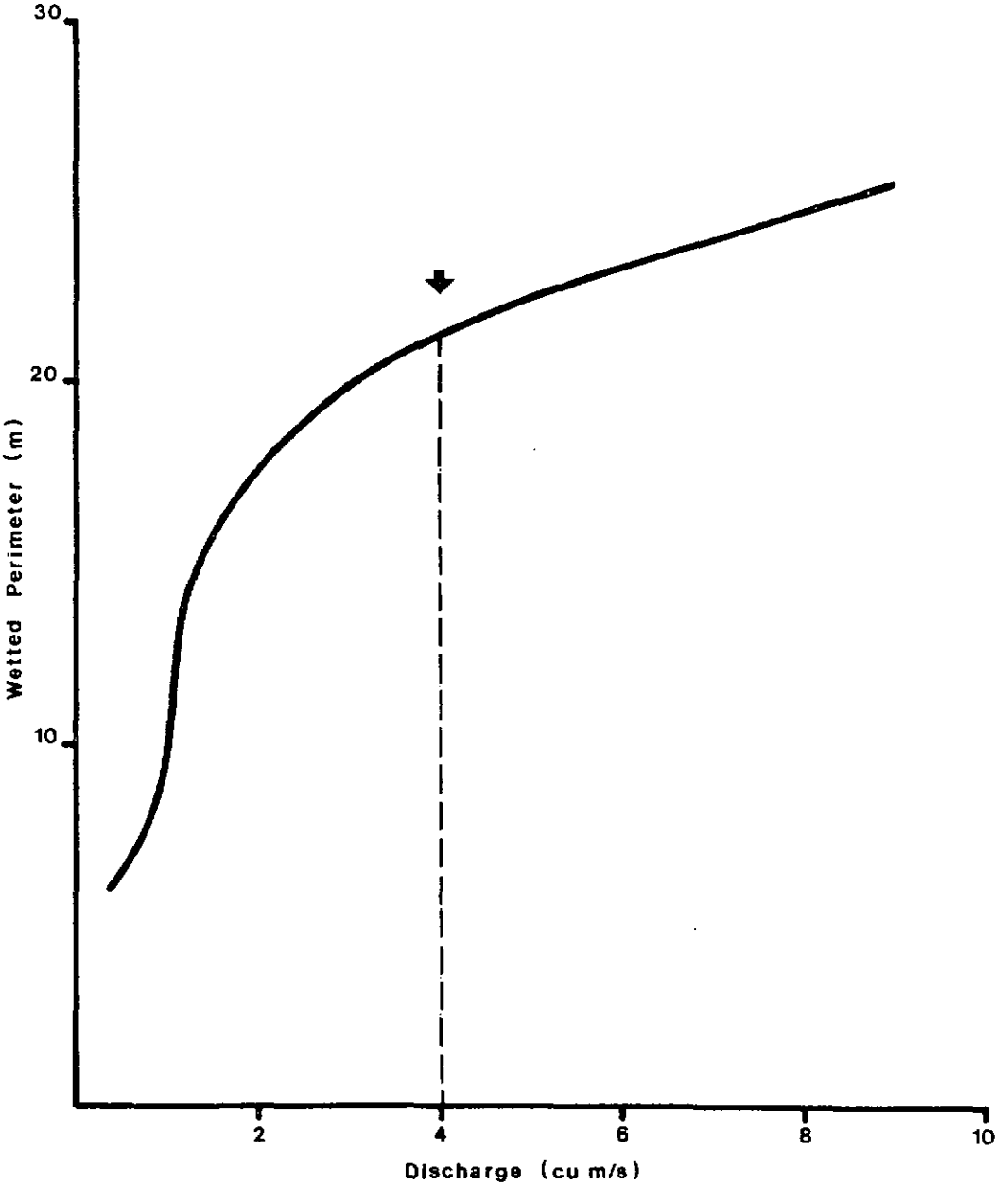


Figure 6. Rearing flow curve for Lemhi River at Club 28.

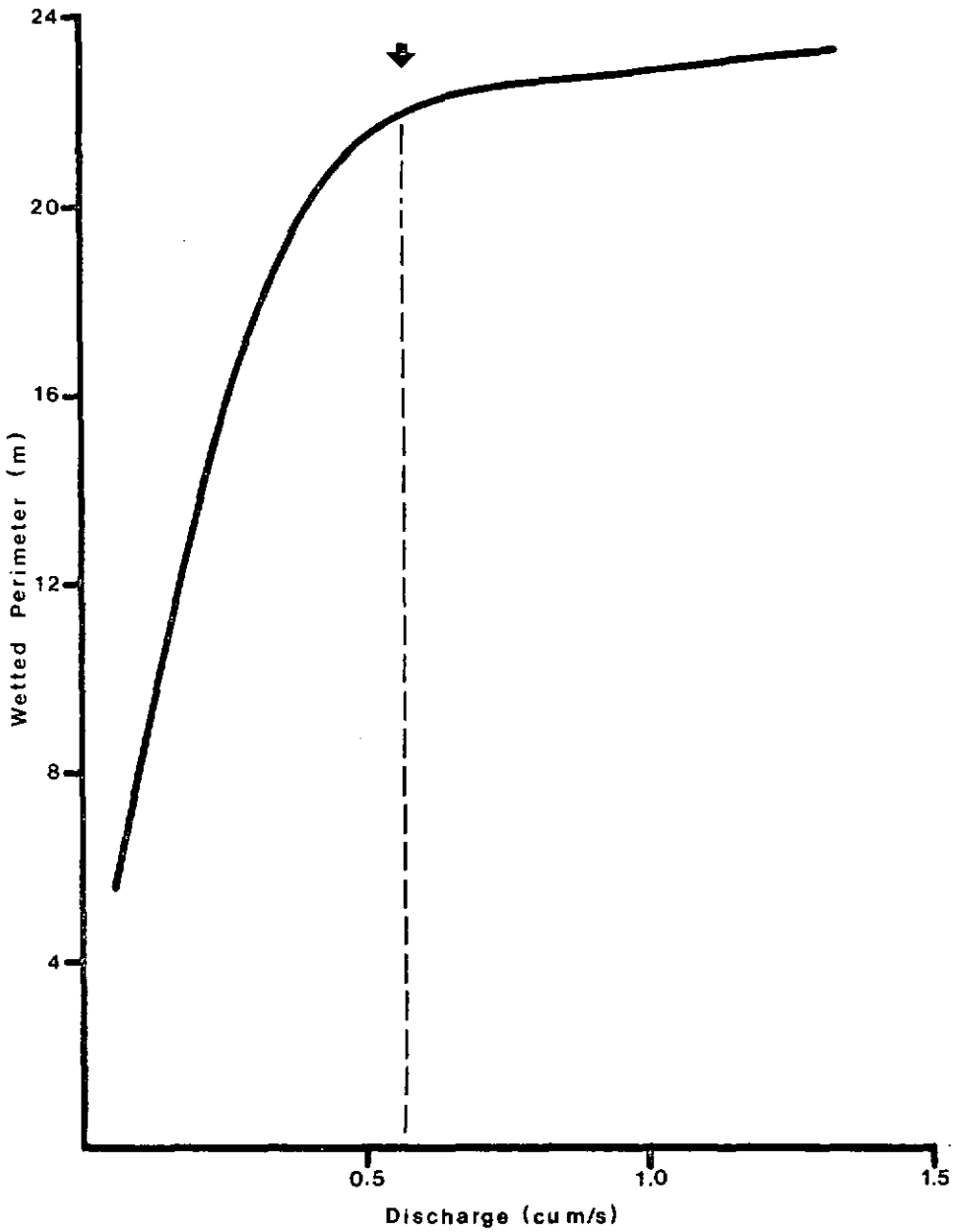


Figure 7. Rearing flow curve for Lemhi River above Big Springs Creek.

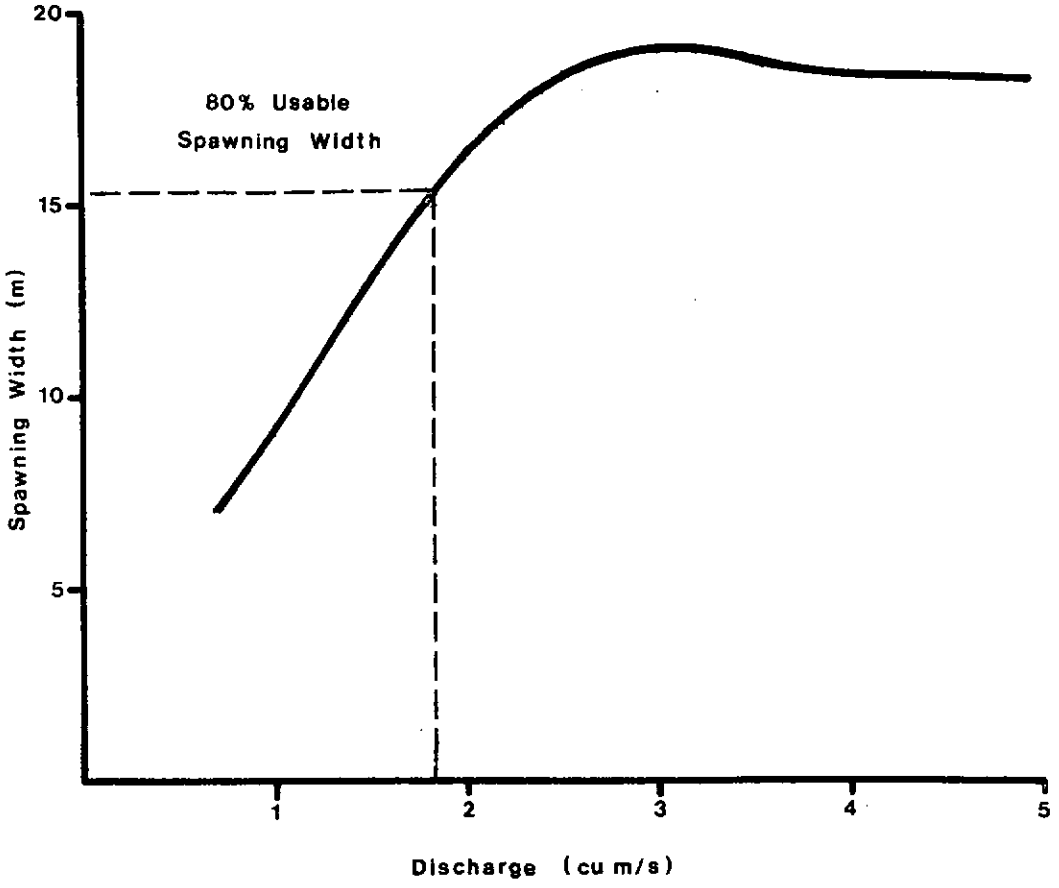


Figure 8. Rainbow trout spawning curve for Lemhi River above Big Springs Creek.

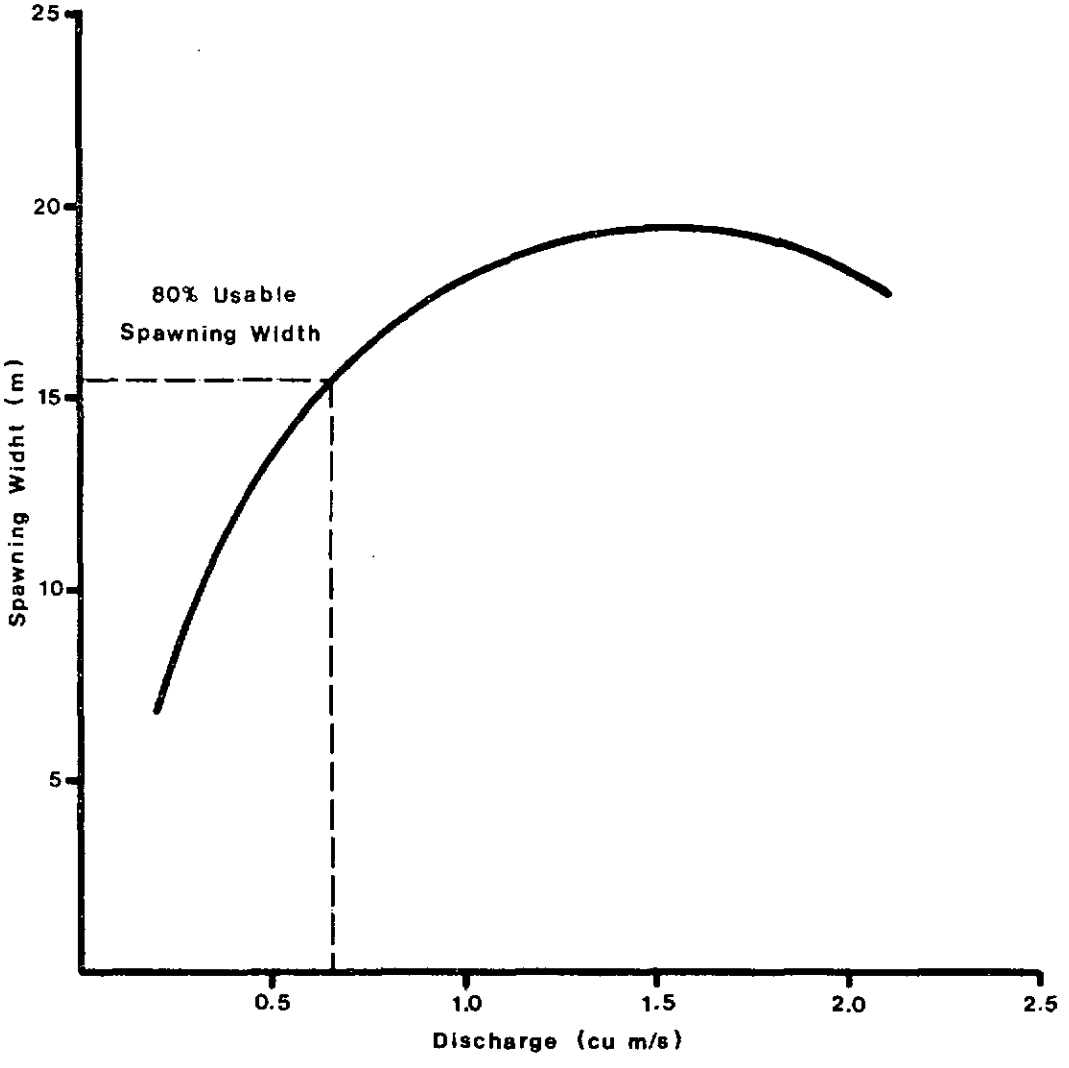


Figure 9. Brook trout spawning curve for Lemhi River above Big Springs Creek.

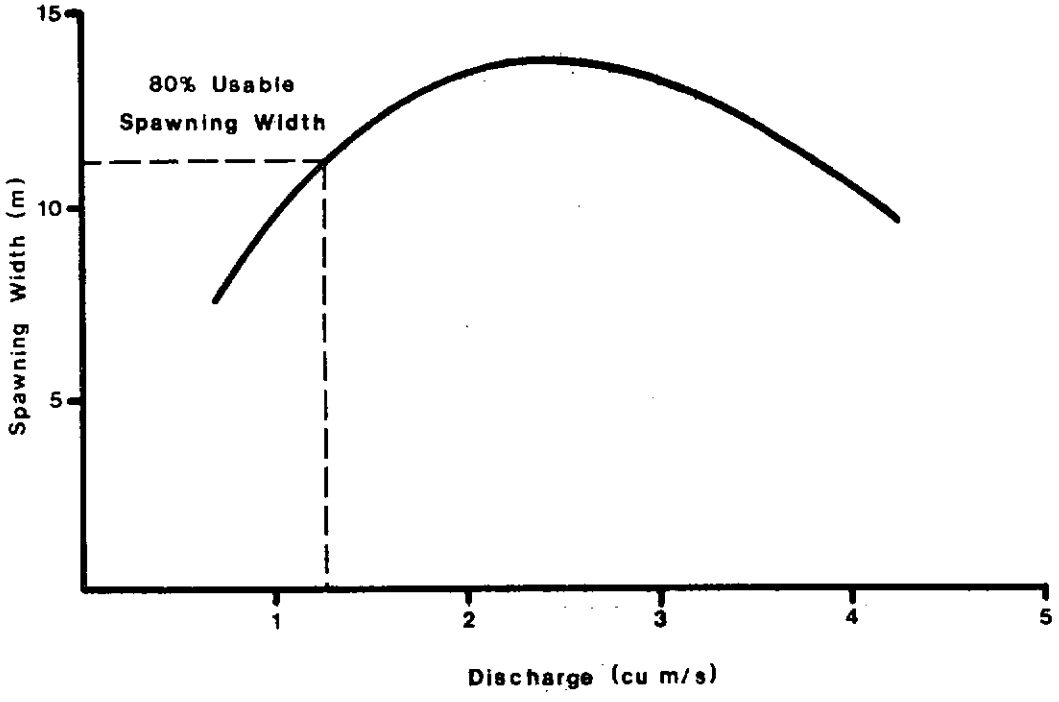


Figure 10. Dolly Varden spawning curve for Lemhi River above Big Springs Creek.

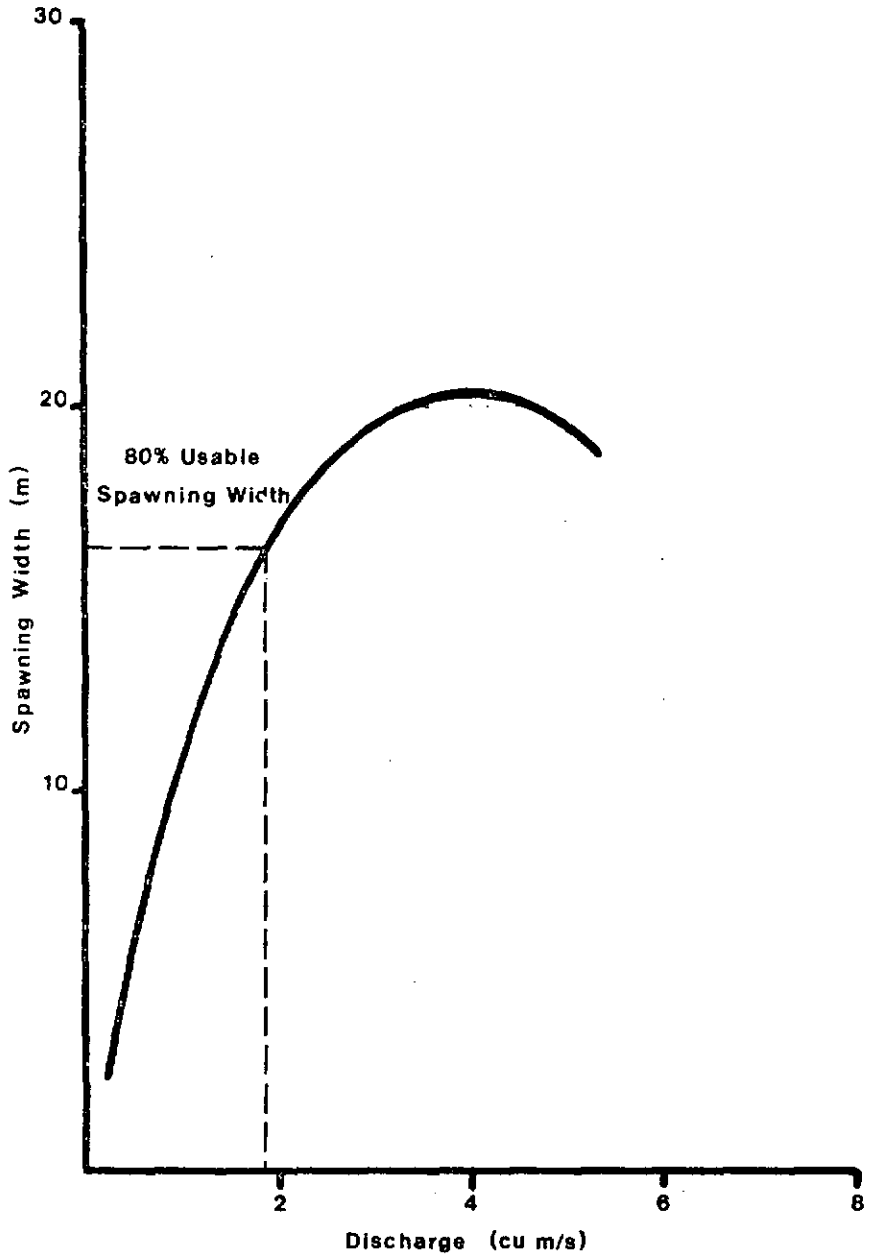


Figure 11. Chinook salmon and steelhead trout spawning curve for Lemhi River above Big Springs Creek.

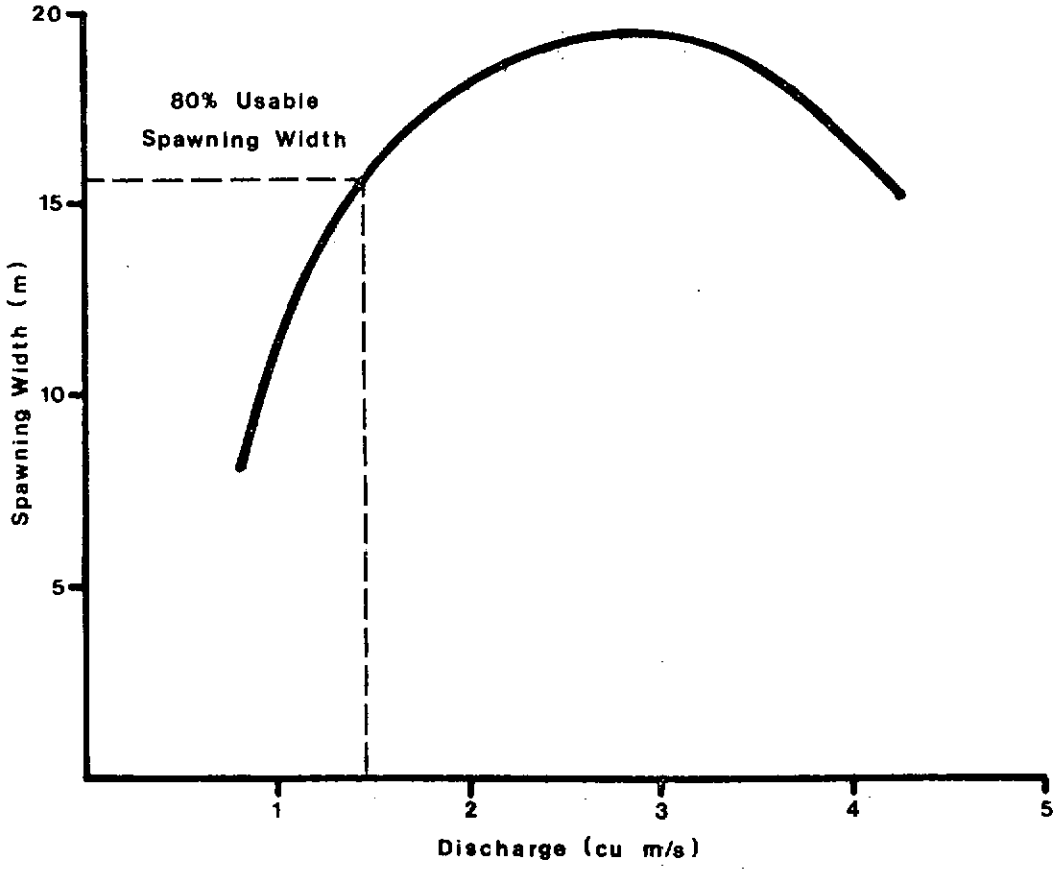


Figure 12. Cutthroat trout spawning curve for Lemhi River above Big Springs Creek.

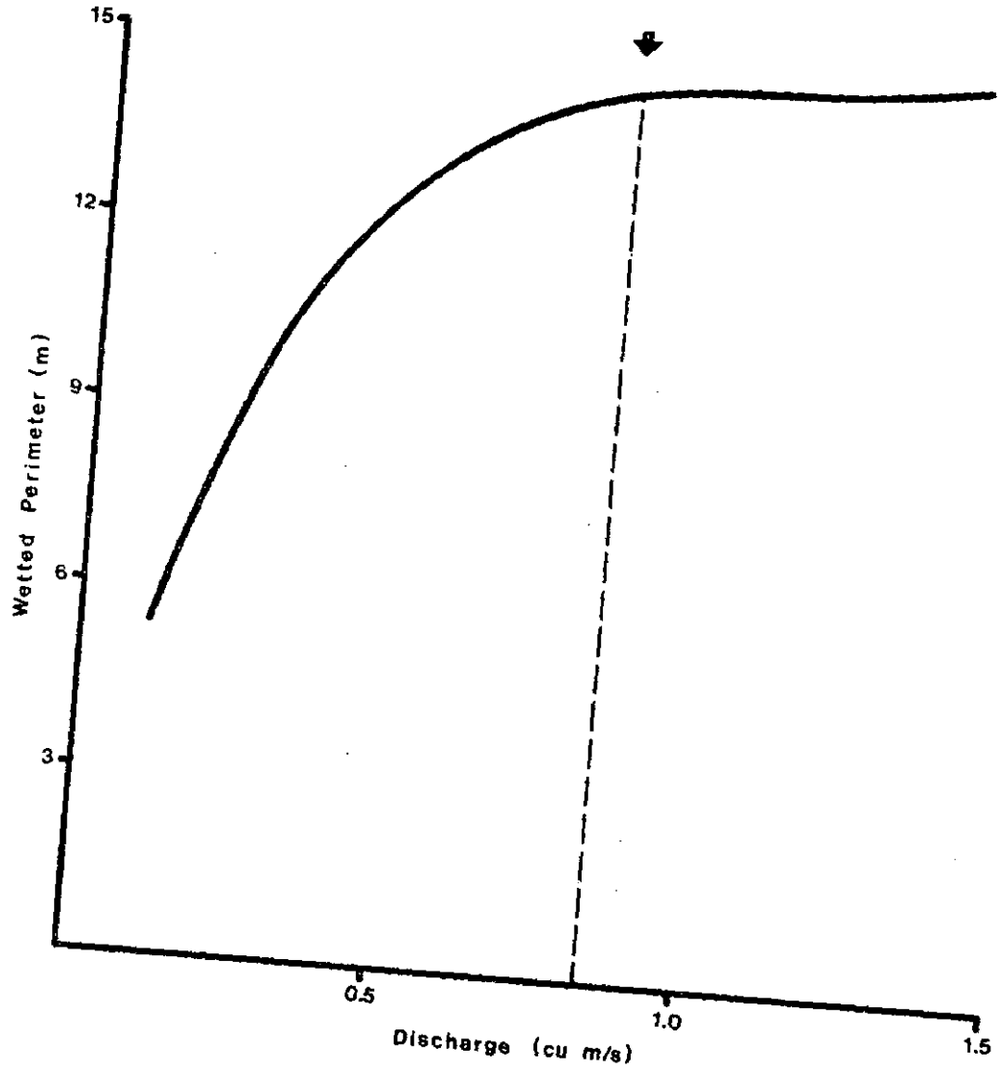


Figure 13. Rearing flow curve for Little Wood River upstream of Richfield.

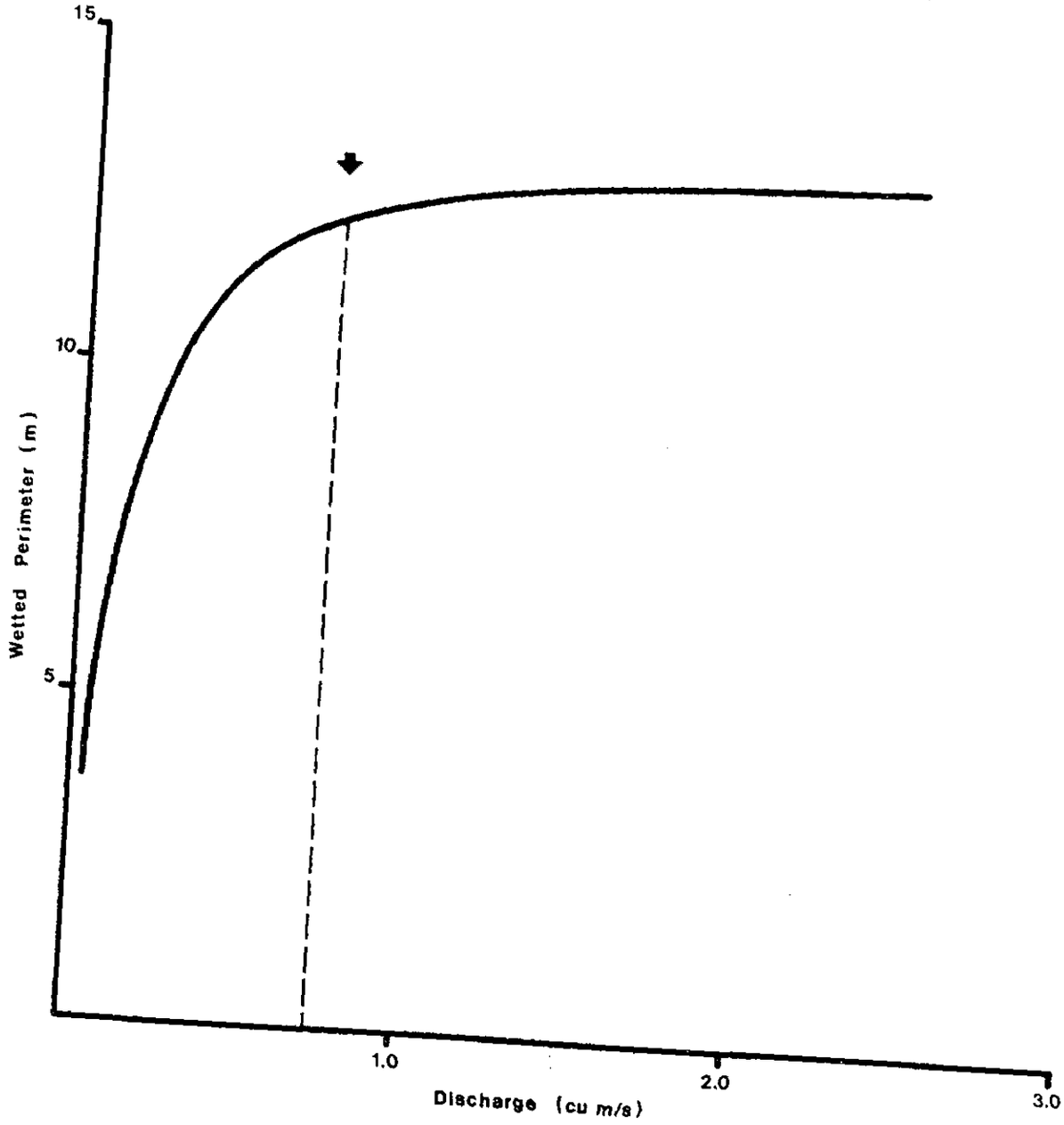


Figure 14. Rearing flow curve for Little Wood River below Richfield.

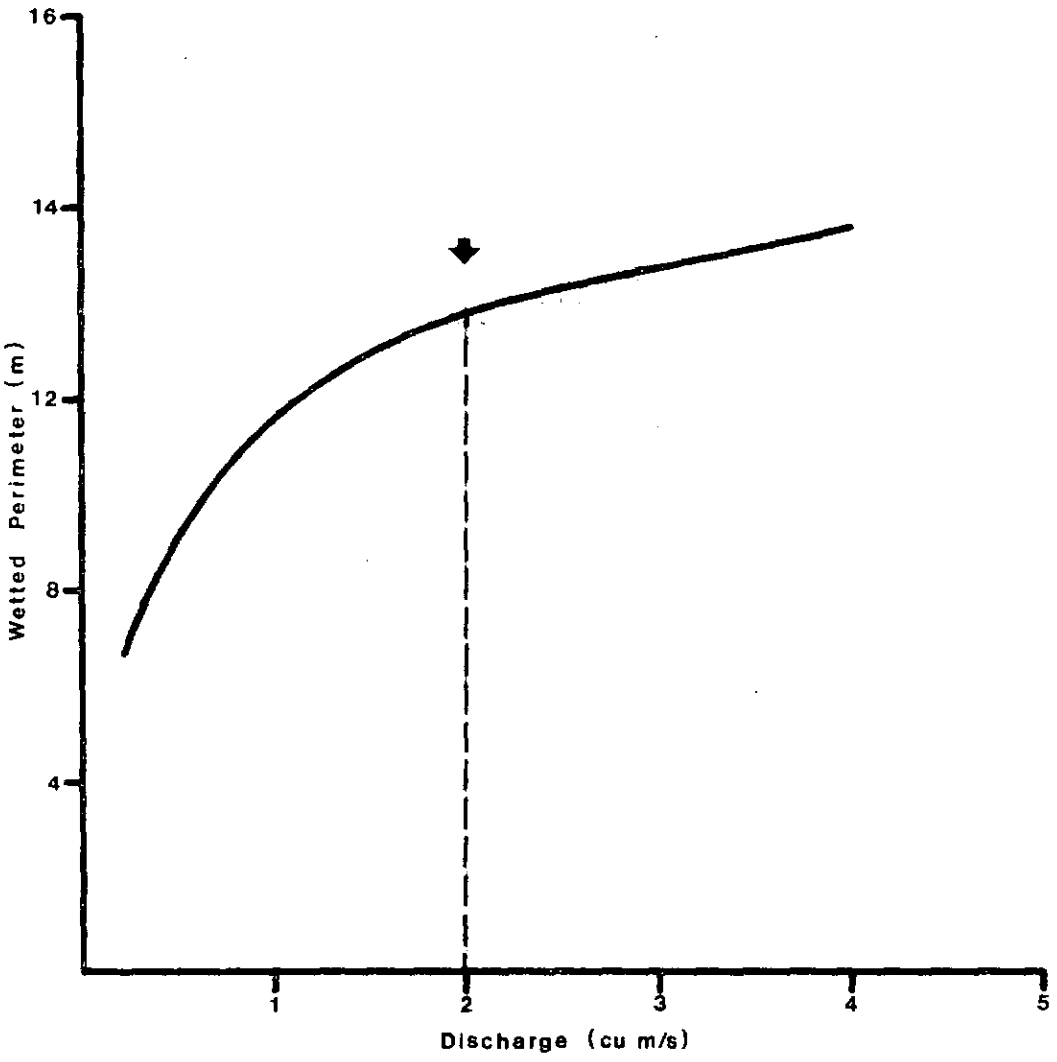


Figure 15. Rearing flow curve for Big Wood River above mouth of East Fork Big Wood River.

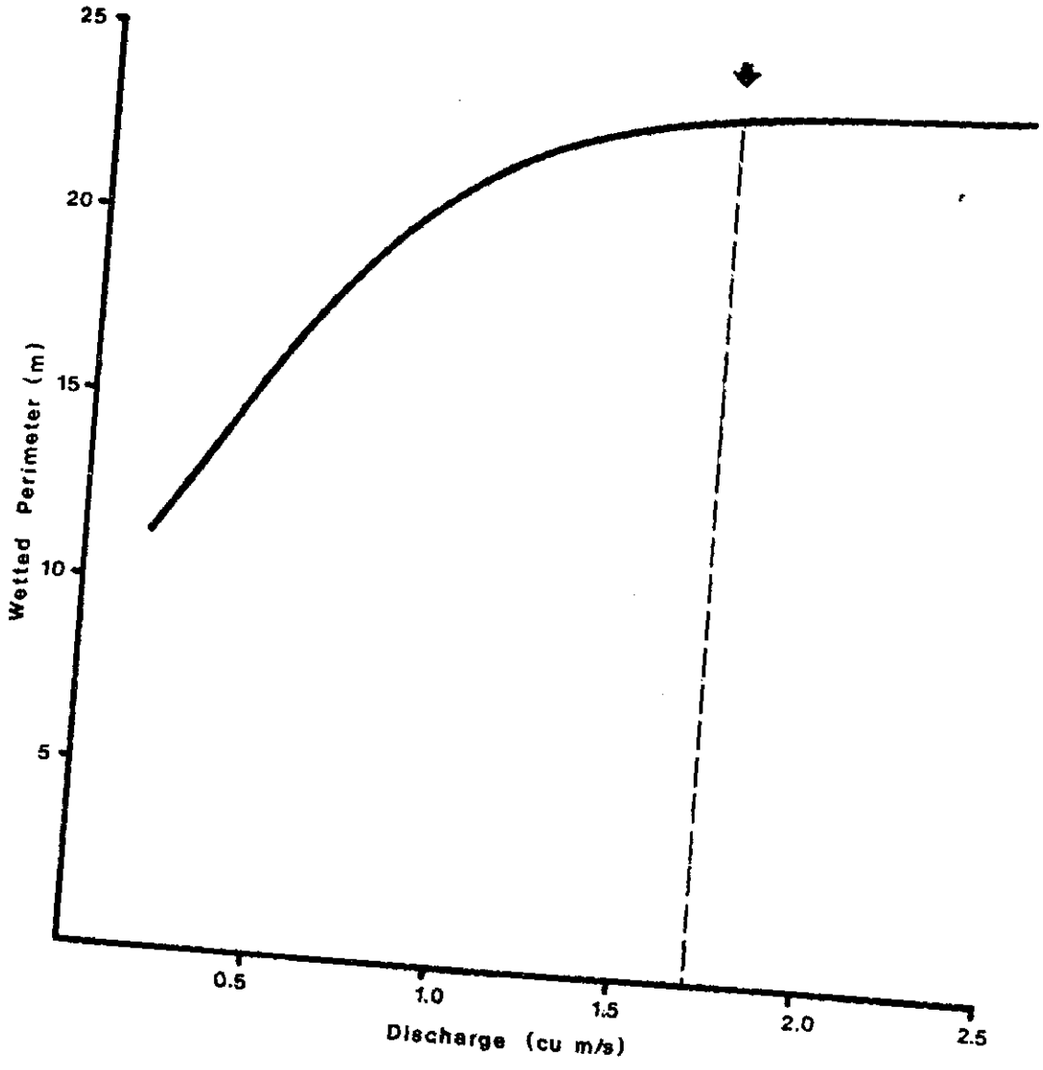


Figure 16. Rearing flow curve for Malad River below Highway 20 bridge.

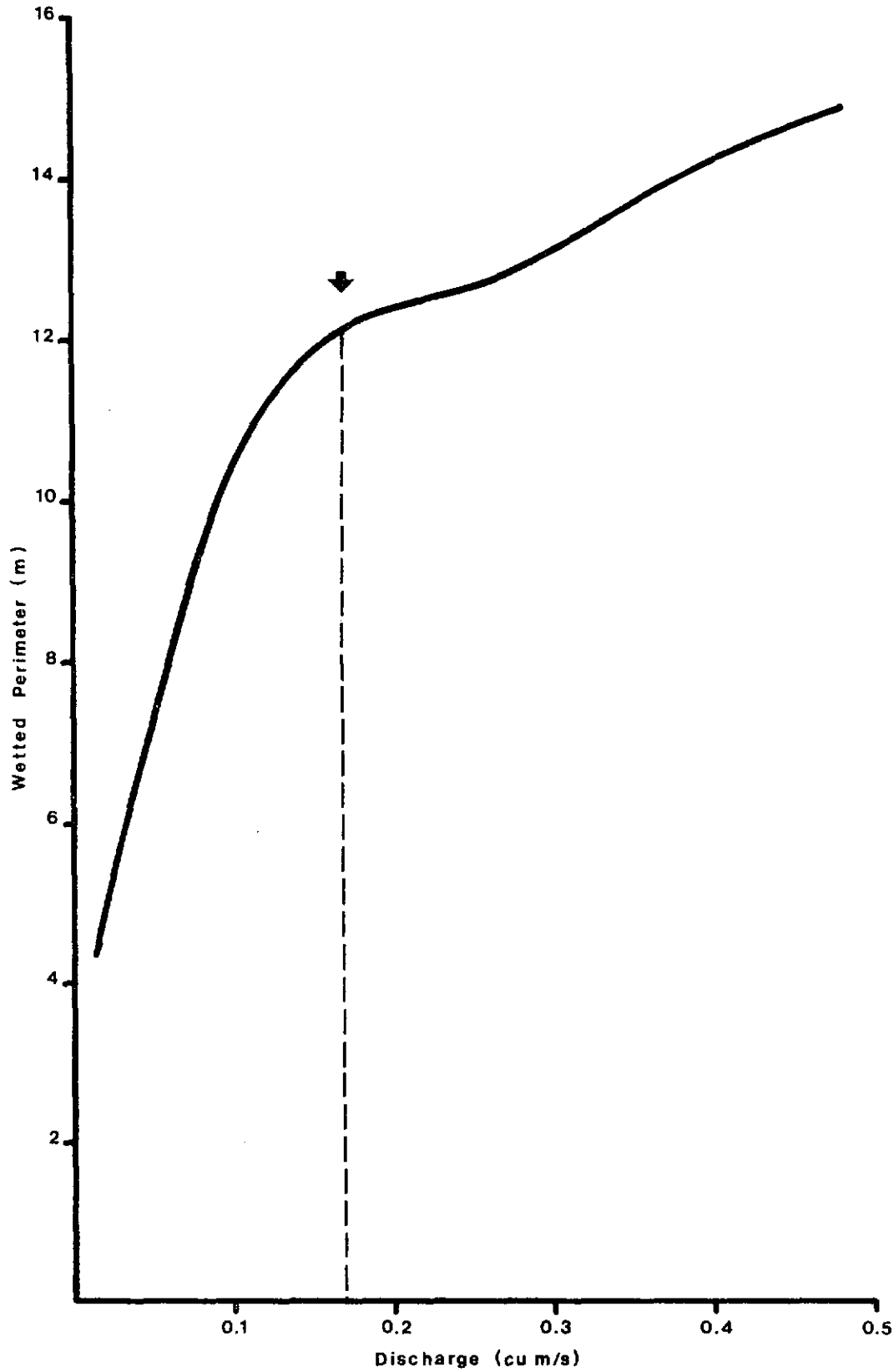


Figure 17. Rearing flow curve for Portneuf River downstream of Lava Hot Springs.

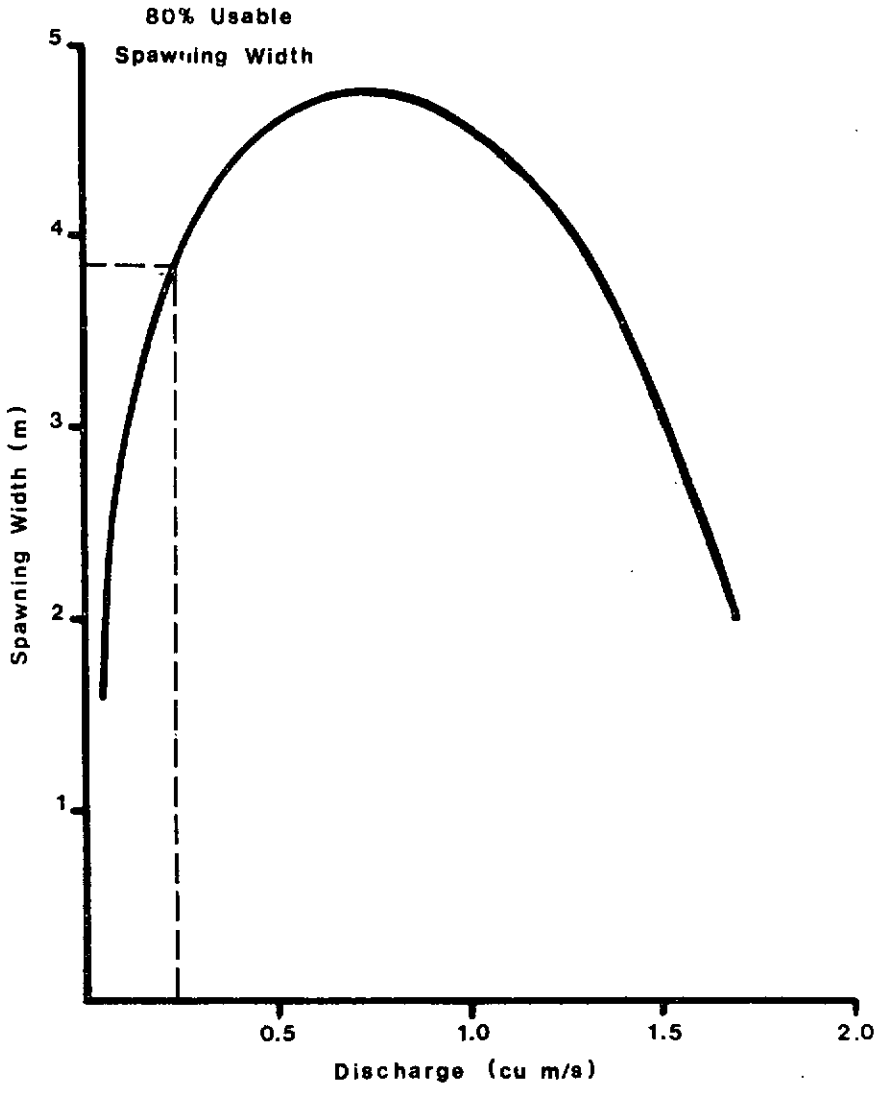


Figure 18. Brown trout spawning curve for Portneuf River downstream of Lava Hot Springs.

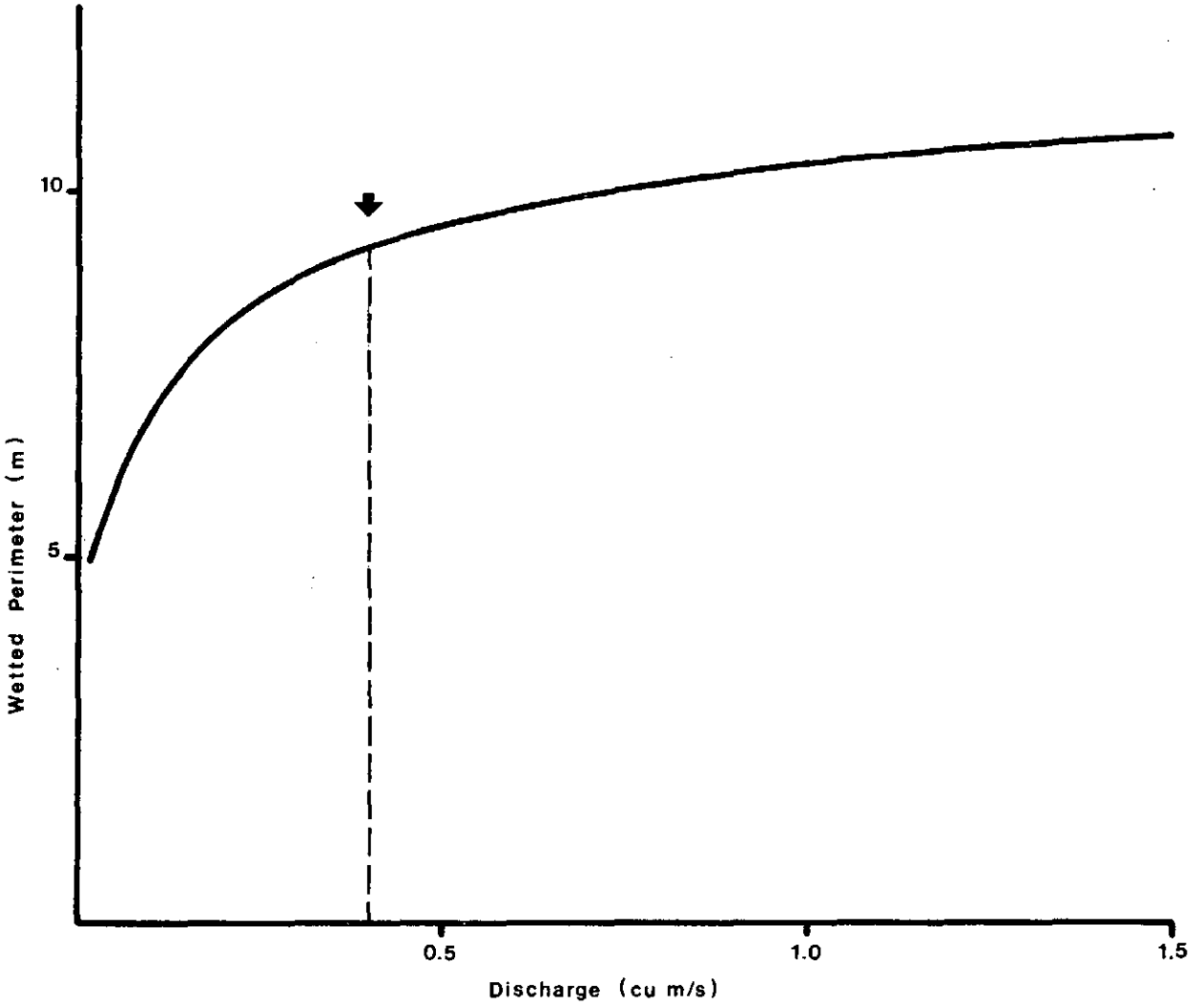


Figure 19. Rearing flow curve for Henrys Lake Outlet.

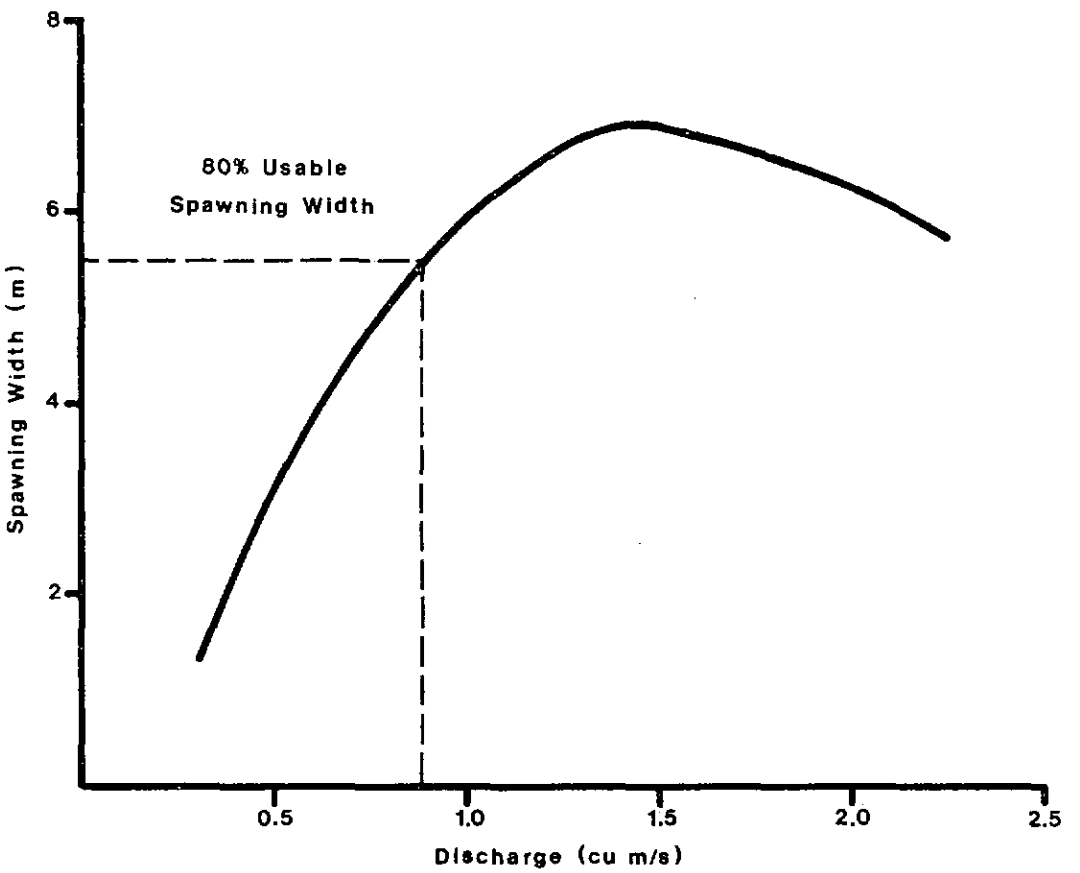


Figure 20. Rainbow trout spawning curve for Henrys Lake Outlet.

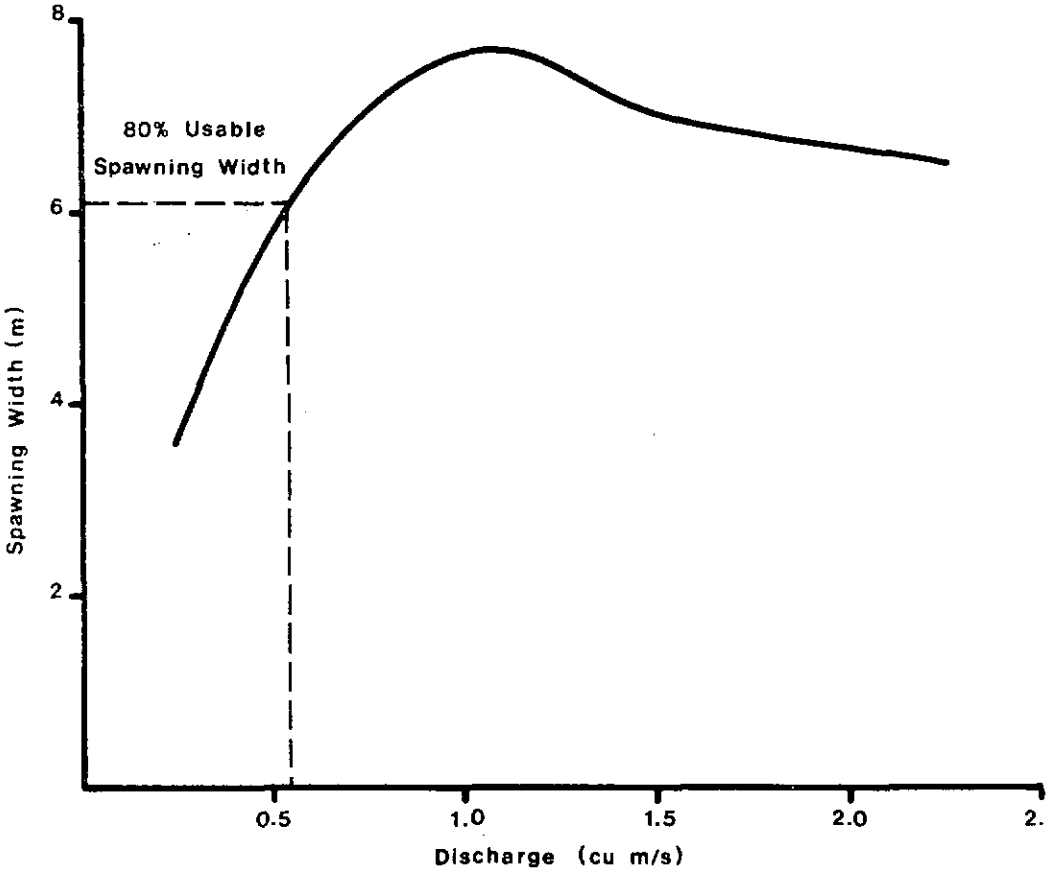


Figure 21. Kokanee salmon spawning curve for Henrys Lake Outlet.

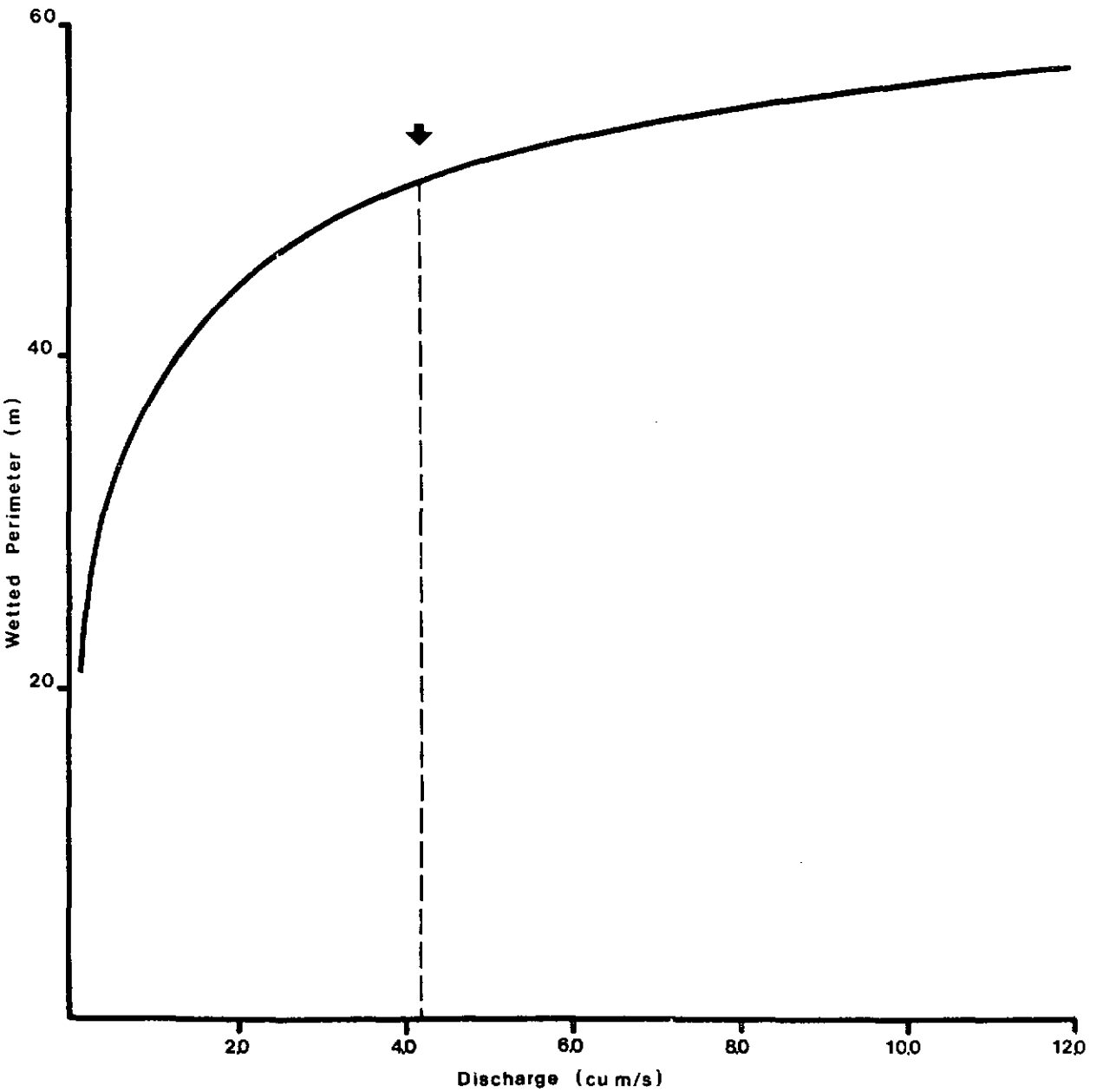


Figure 22. Rearing flow curve for Henrys Fork Snake River below Mack's Inn.

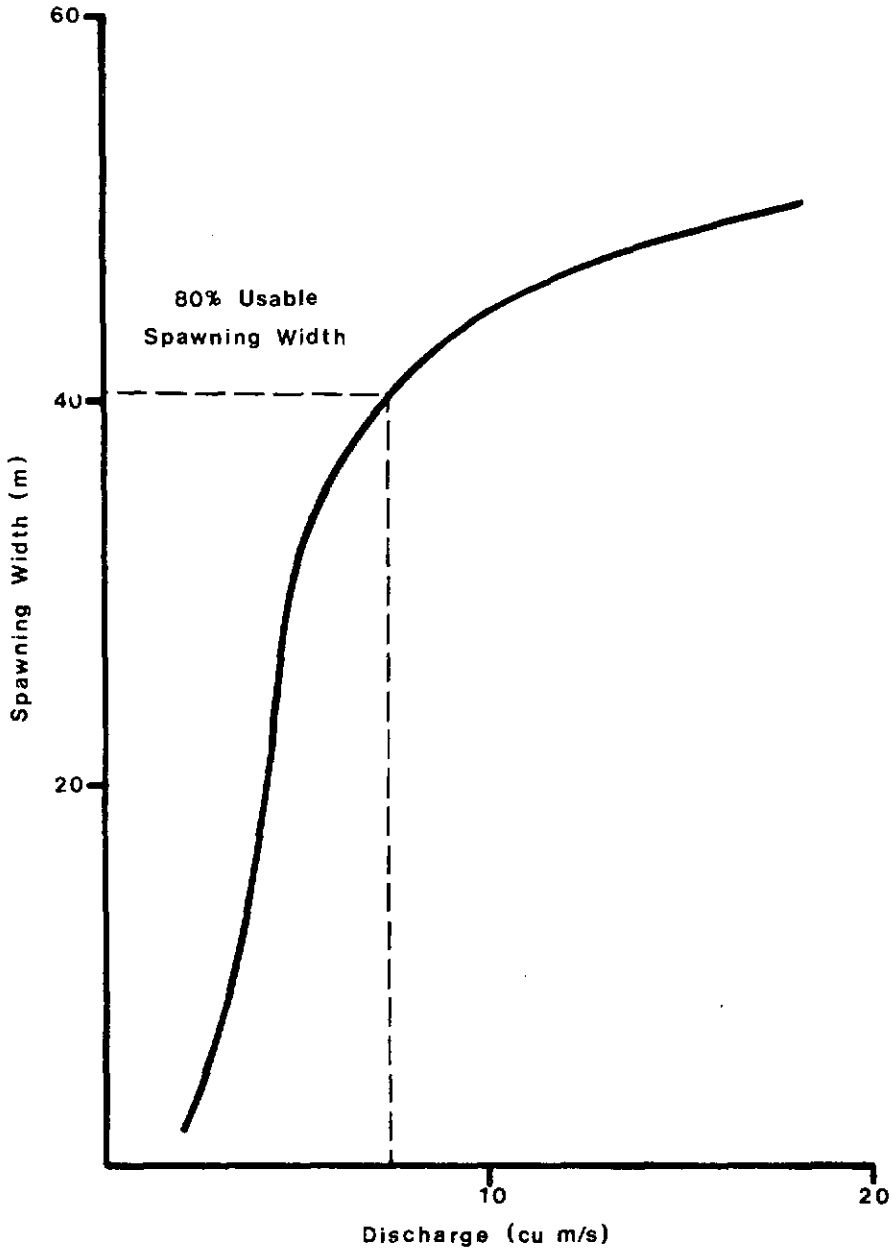


Figure 23. Rainbow trout spawning curve for Henrys Fork Snake River below Mack's Inn.

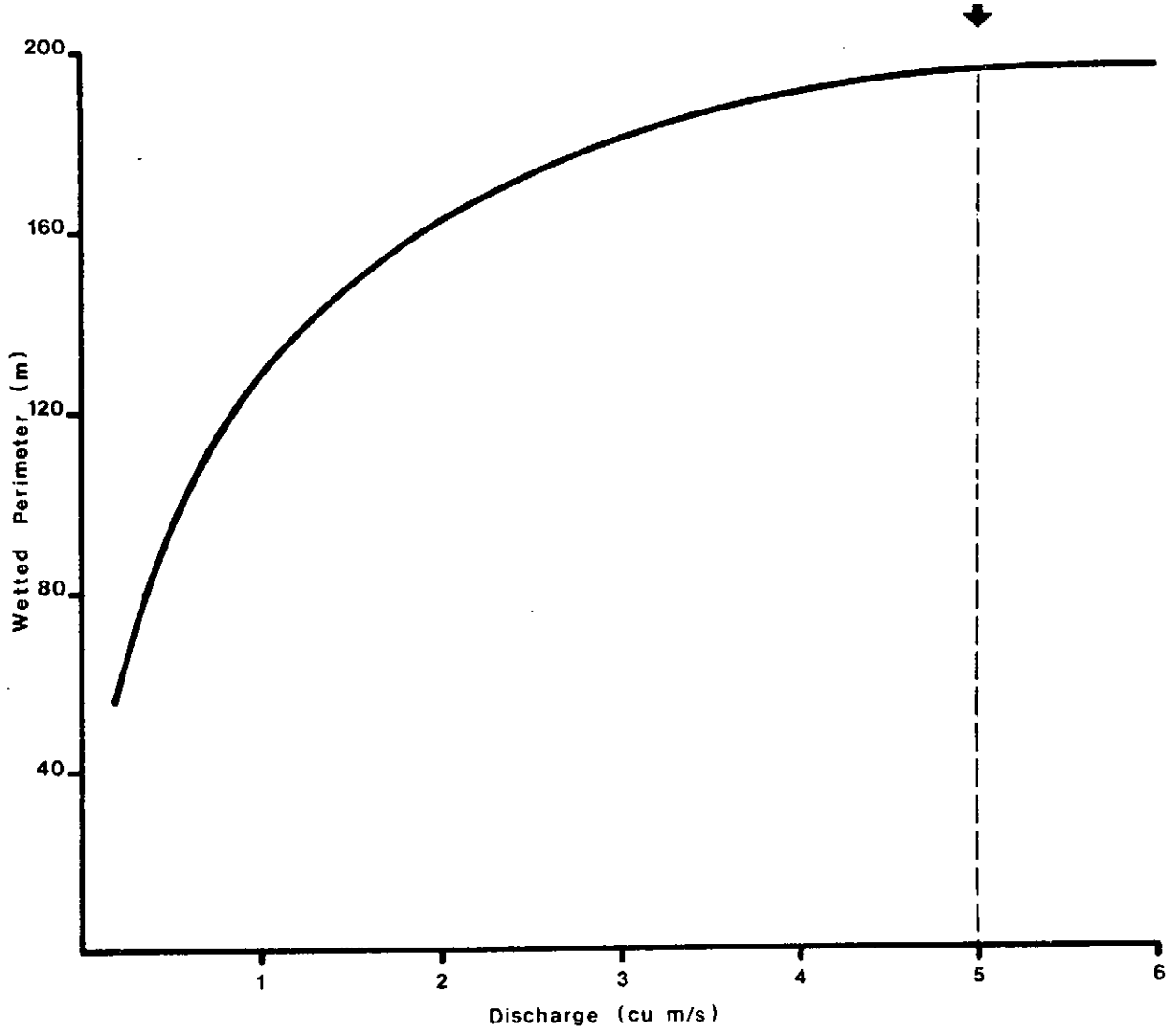


Figure 24. Rearing flow curve for Henrys Fork Snake River at Harriman Park.

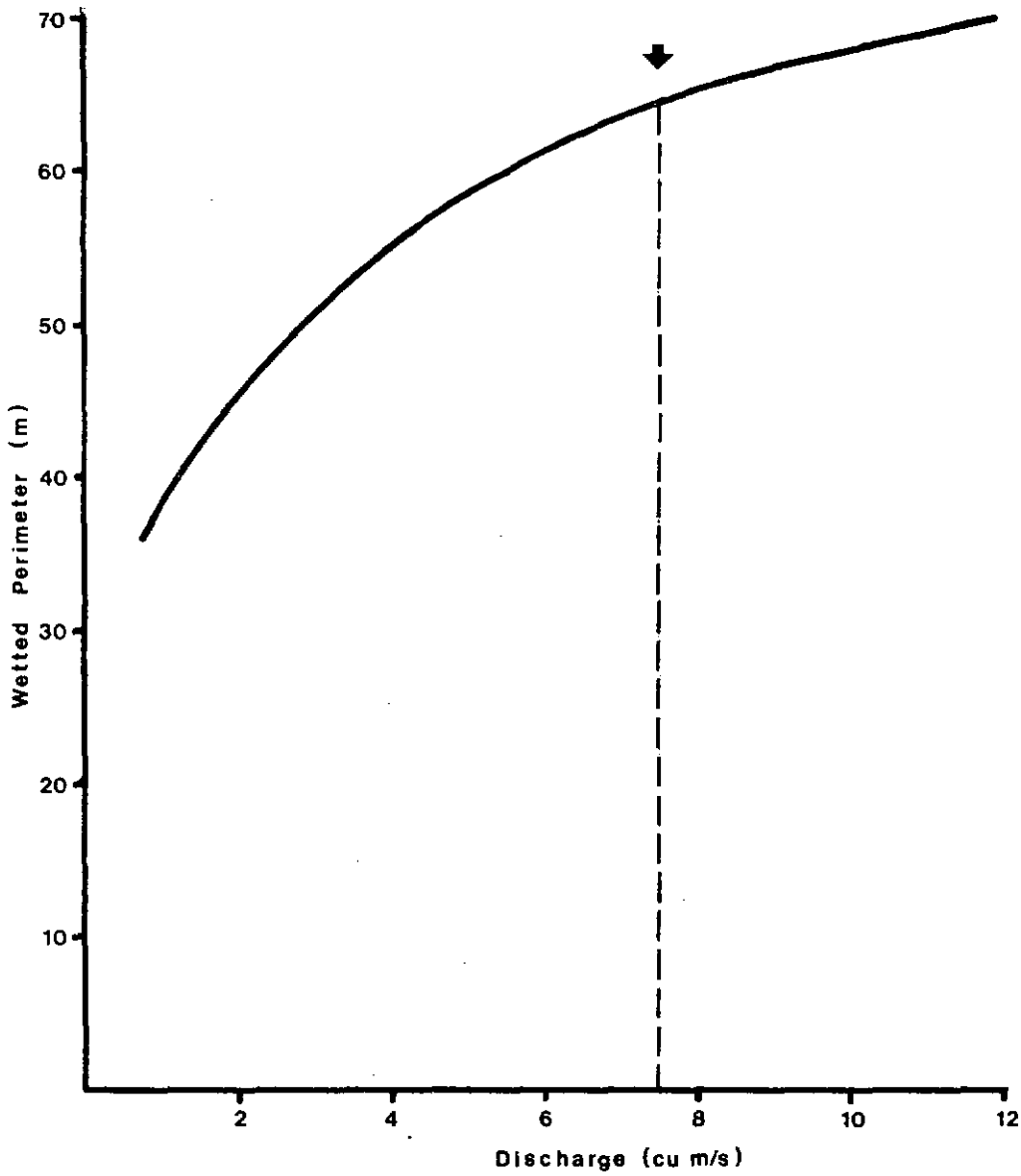


Figure 25. Rearing flow curve for Henrys Fork Snake River above Wendell bridge.

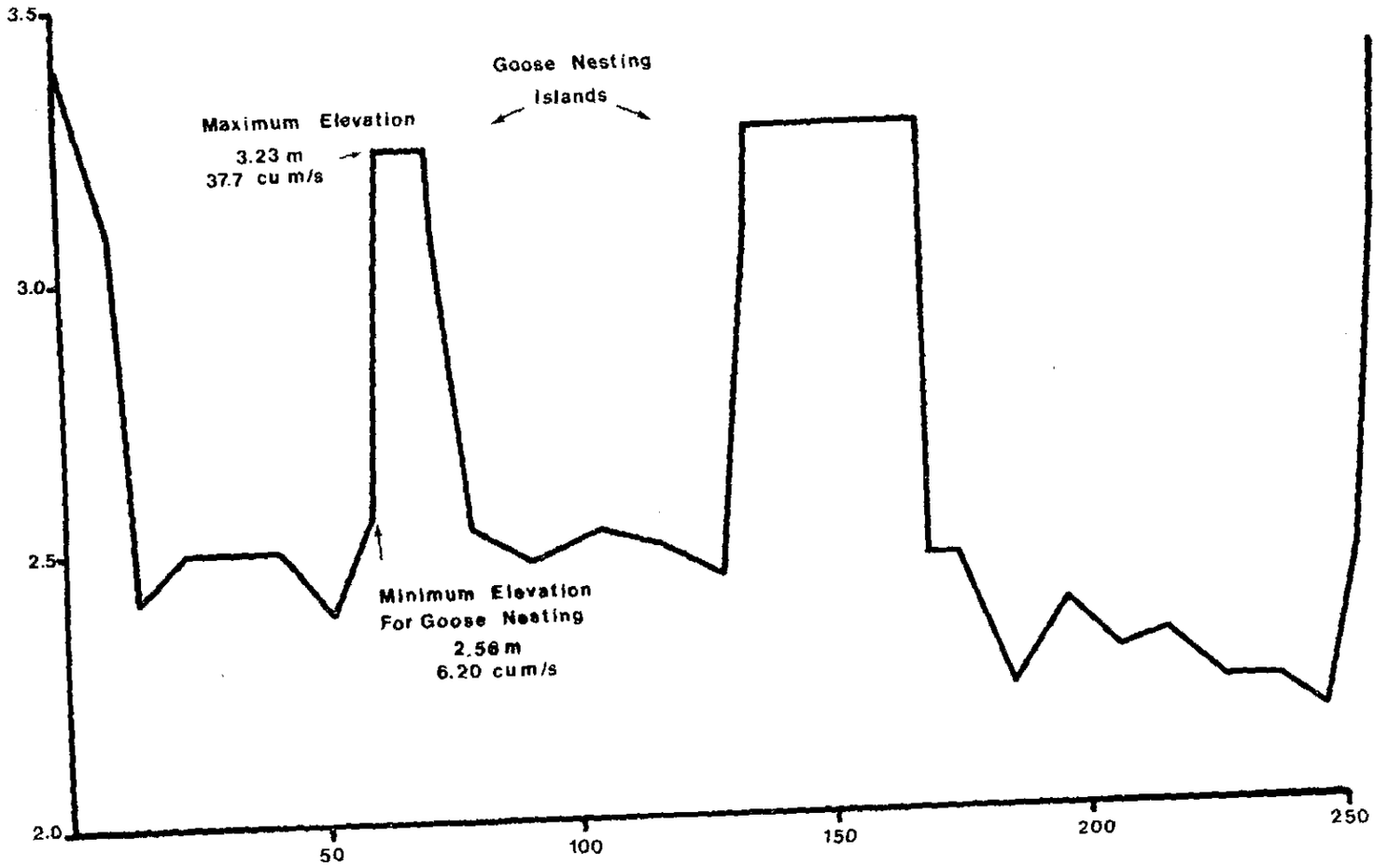


Figure 26. Waterfowl nesting study site on Henrys Fork Snake River at Harriman Park.

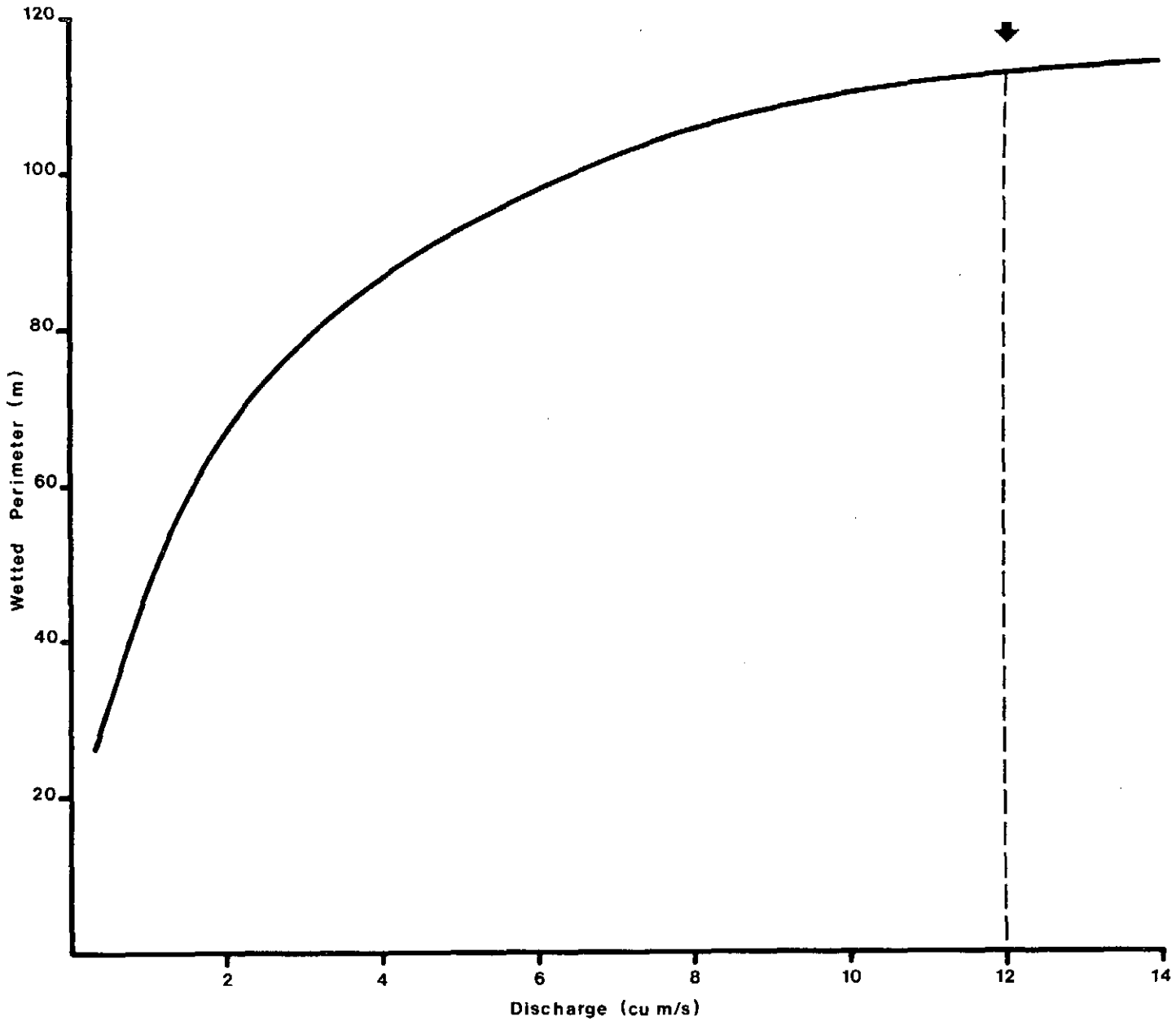


Figure 27. Rearing flow curve for Henrys Fork Snake River upstream of St. Anthony.

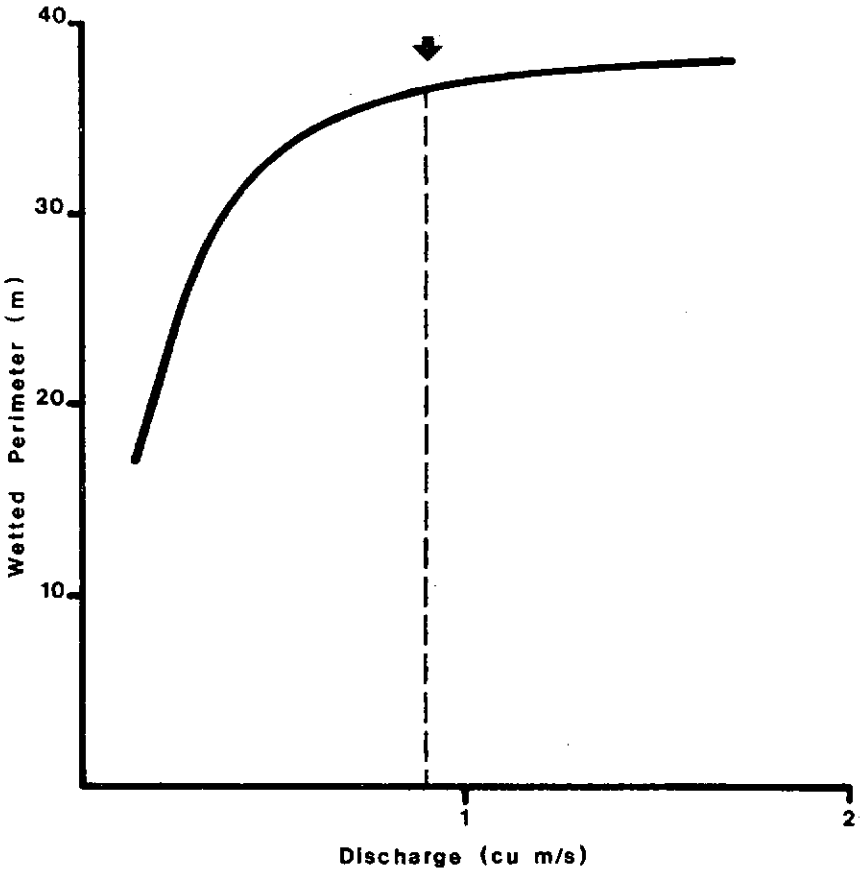


Figure 28. Rearing flow curve for Buffalo River downstream of Highway 20/191 bridge.

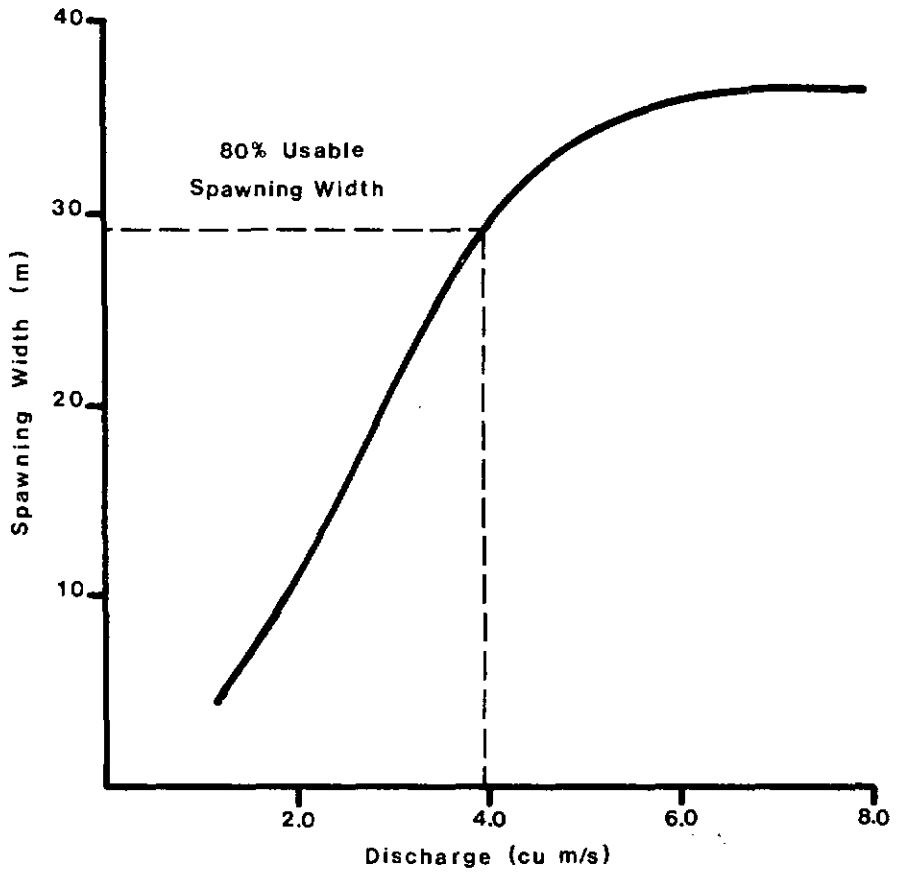


Figure 29. Rainbow trout spawning curve for Buffalo River downstream of Highway 20/191 bridge.

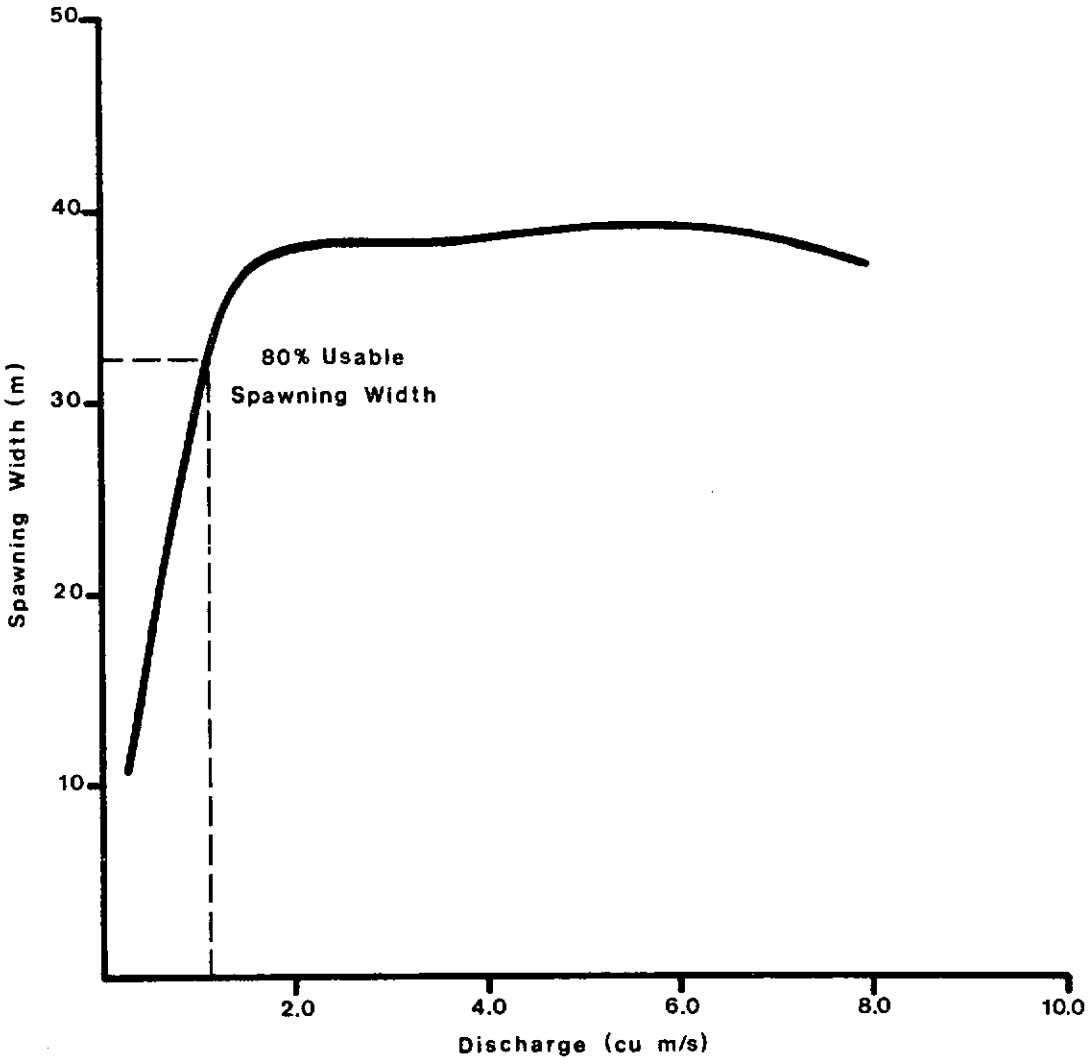


Figure 30. Brook trout spawning curve for Buffalo River downstream of Highway 20/191 bridge.

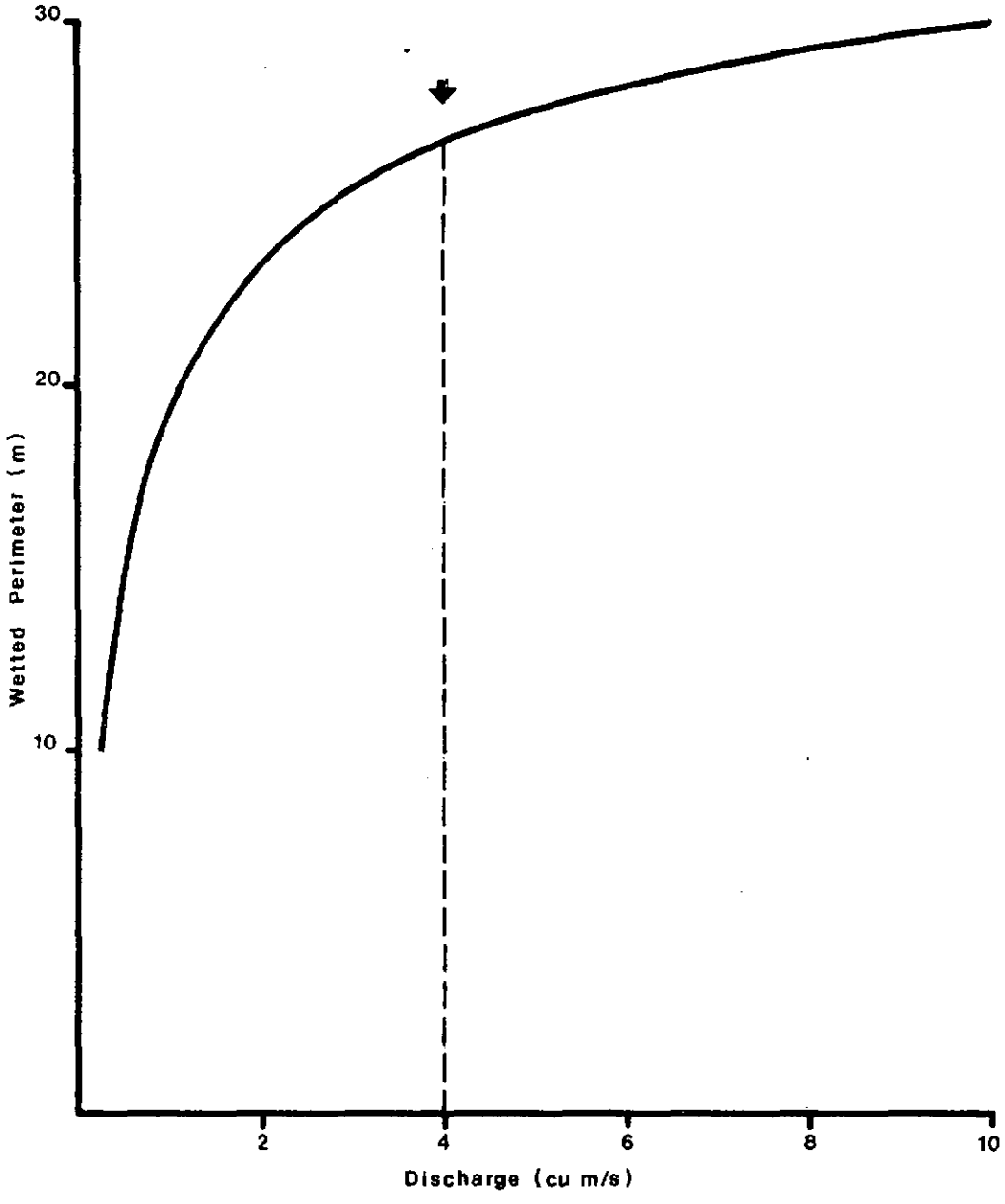


Figure 31. Rearing flow curve for Warm River downstream of Robinson Creek.

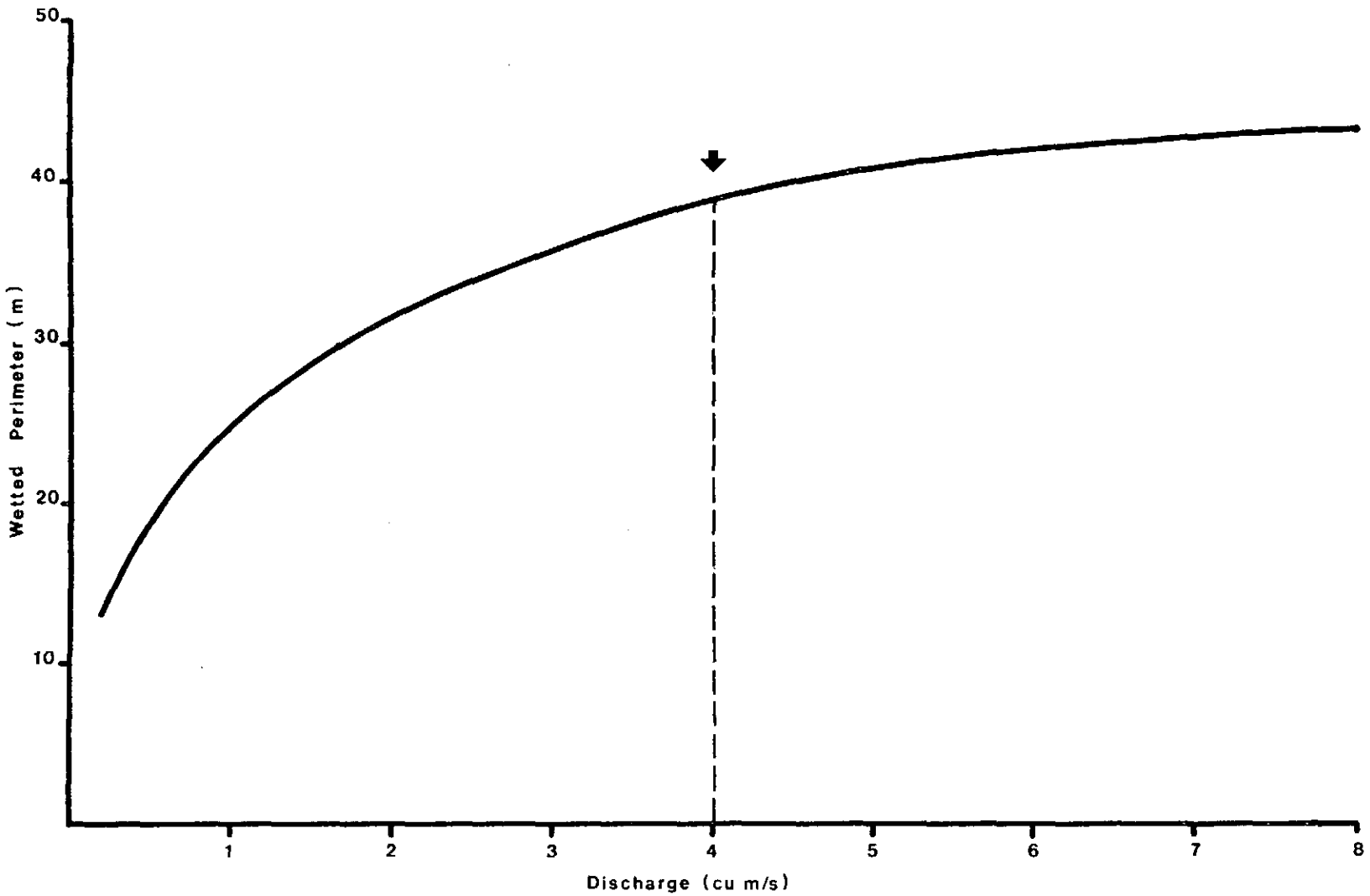


Figure 32. Rearing flow curve for Fall River above Highway 20/191 bridge.

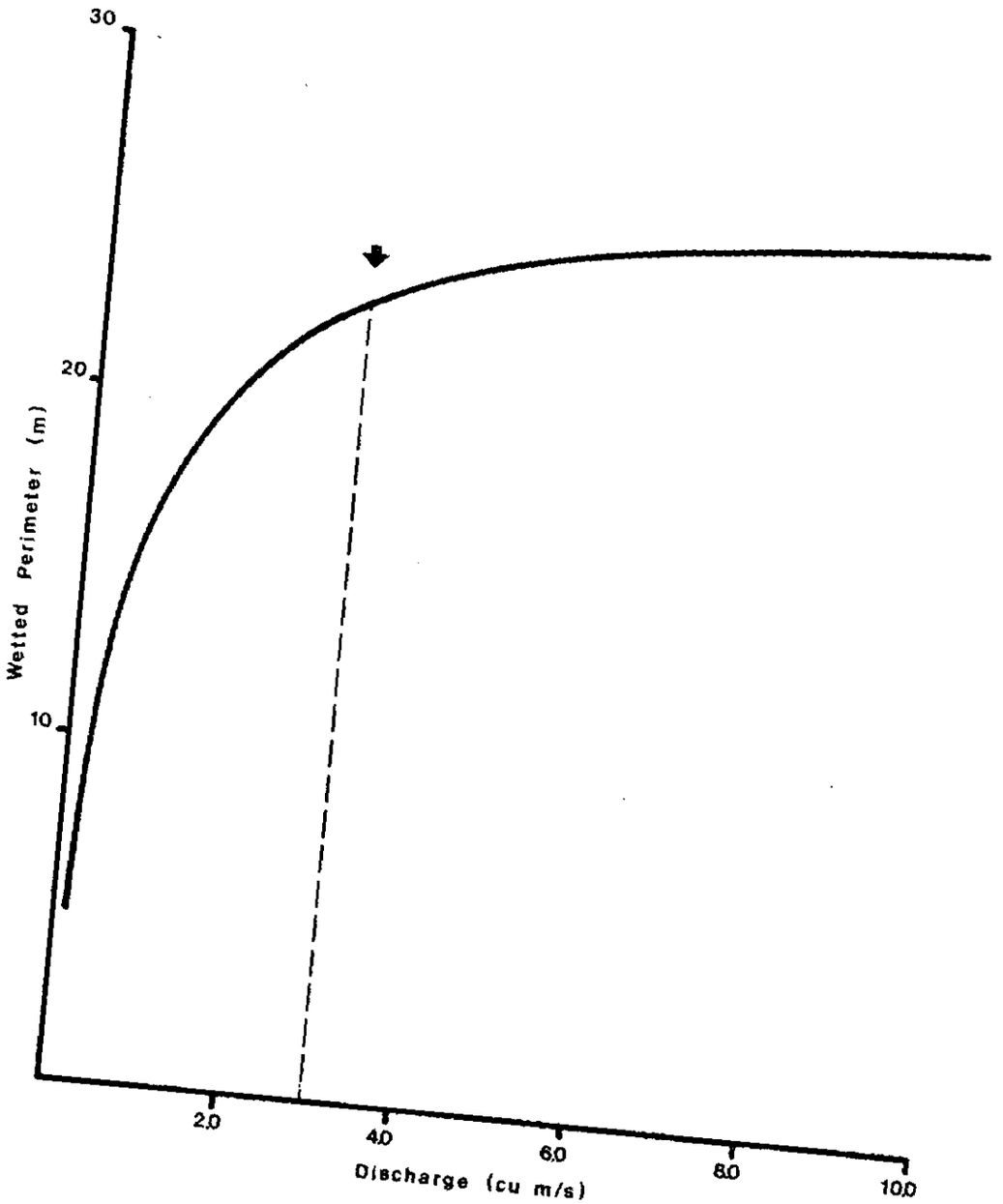


Figure 33. Rearing flow curve for Teton River downstream of Highway 33 bridge.

Figure 34. Rearing flow curve for Bitch Creek downstream of Highway 32 bridge.

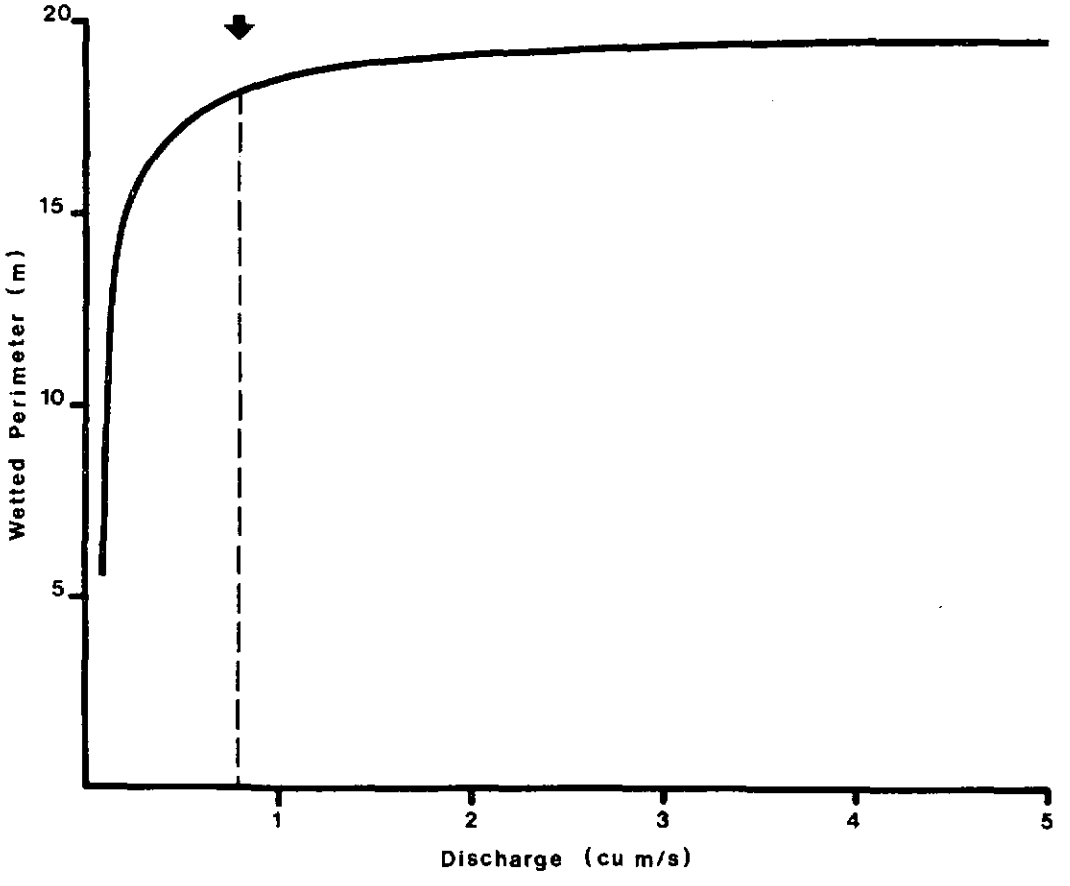
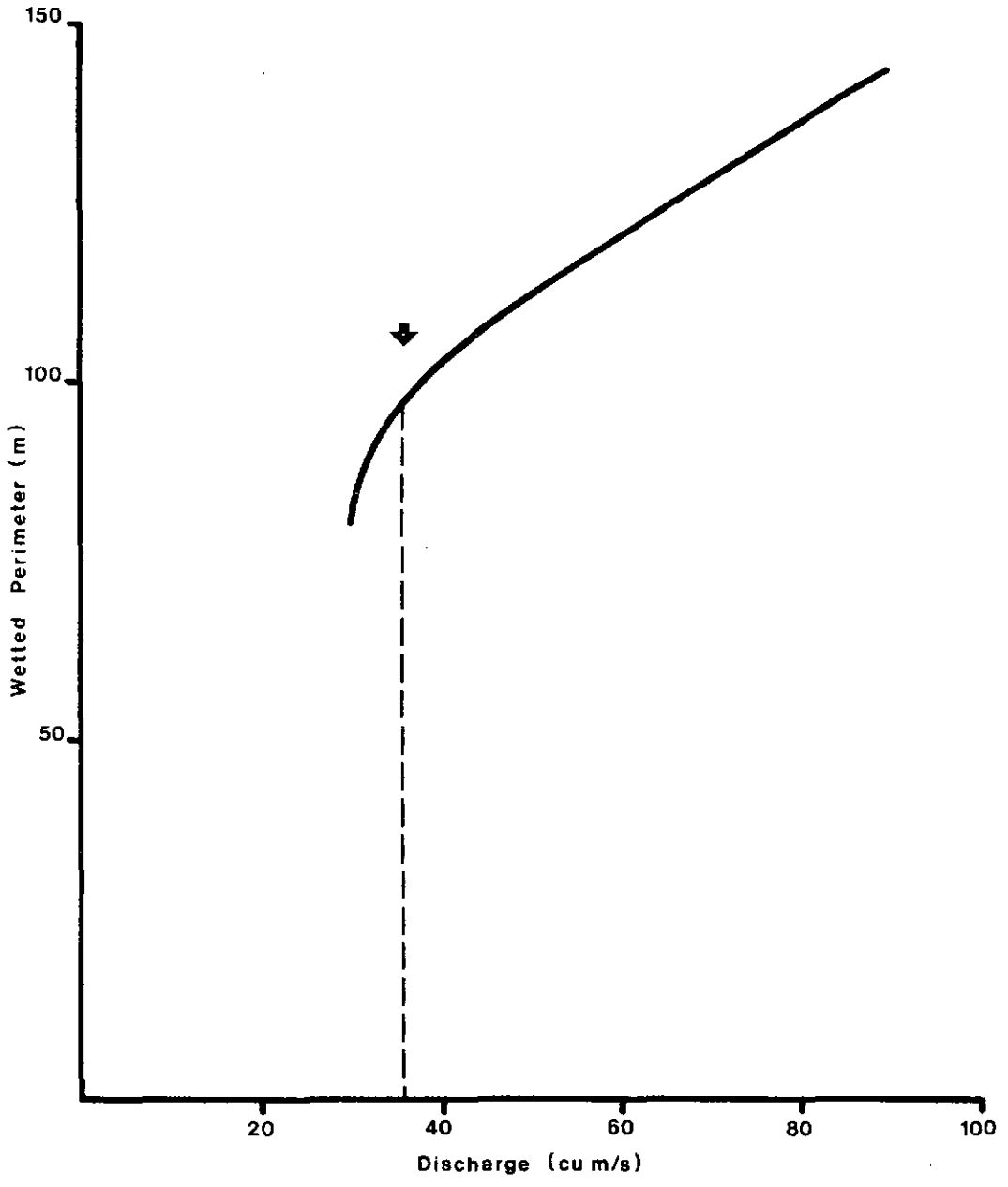


Figure 35. Rearing flow curve for South Fork Snake River downstream of Highway 26 bridge.



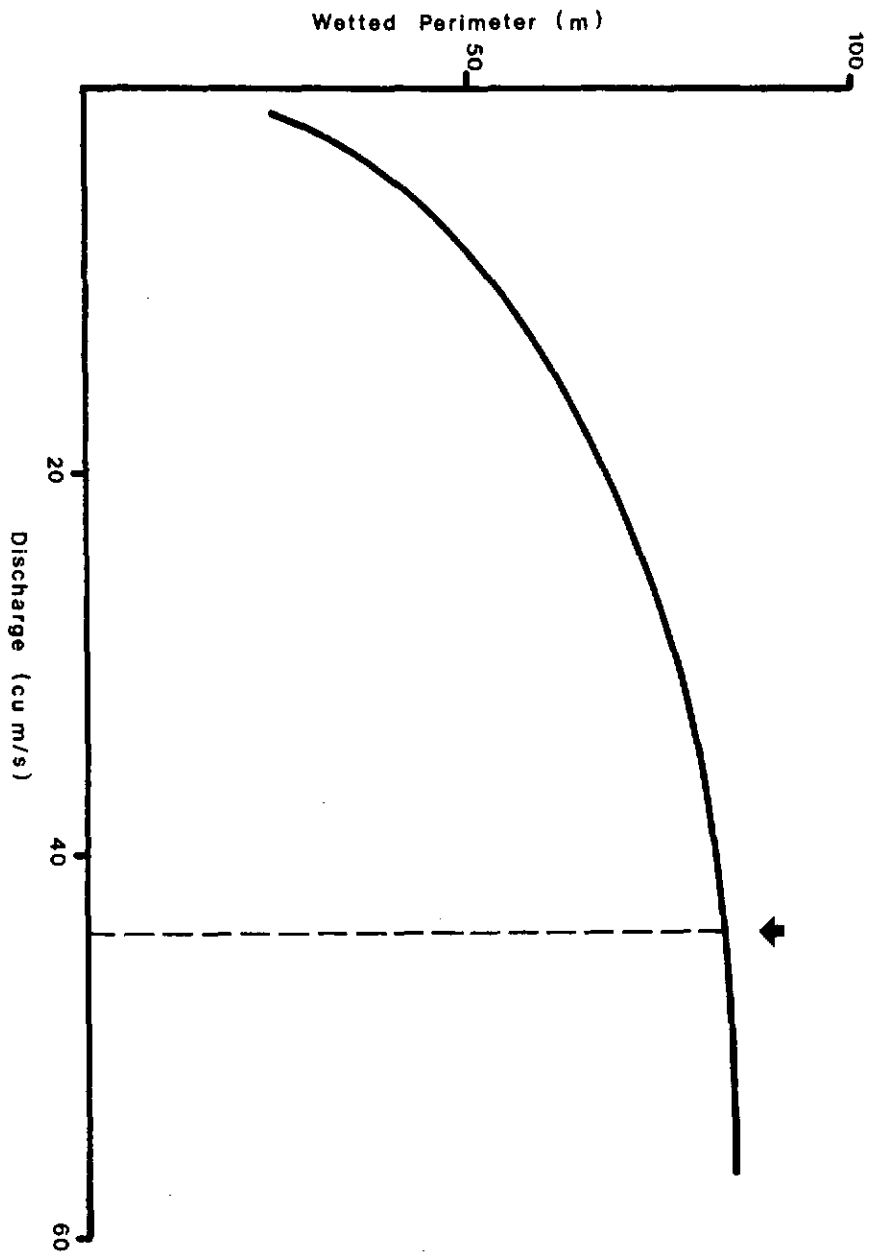


Figure 37. Rearing flow curve for main Snake River upstream of Rose Bridge.

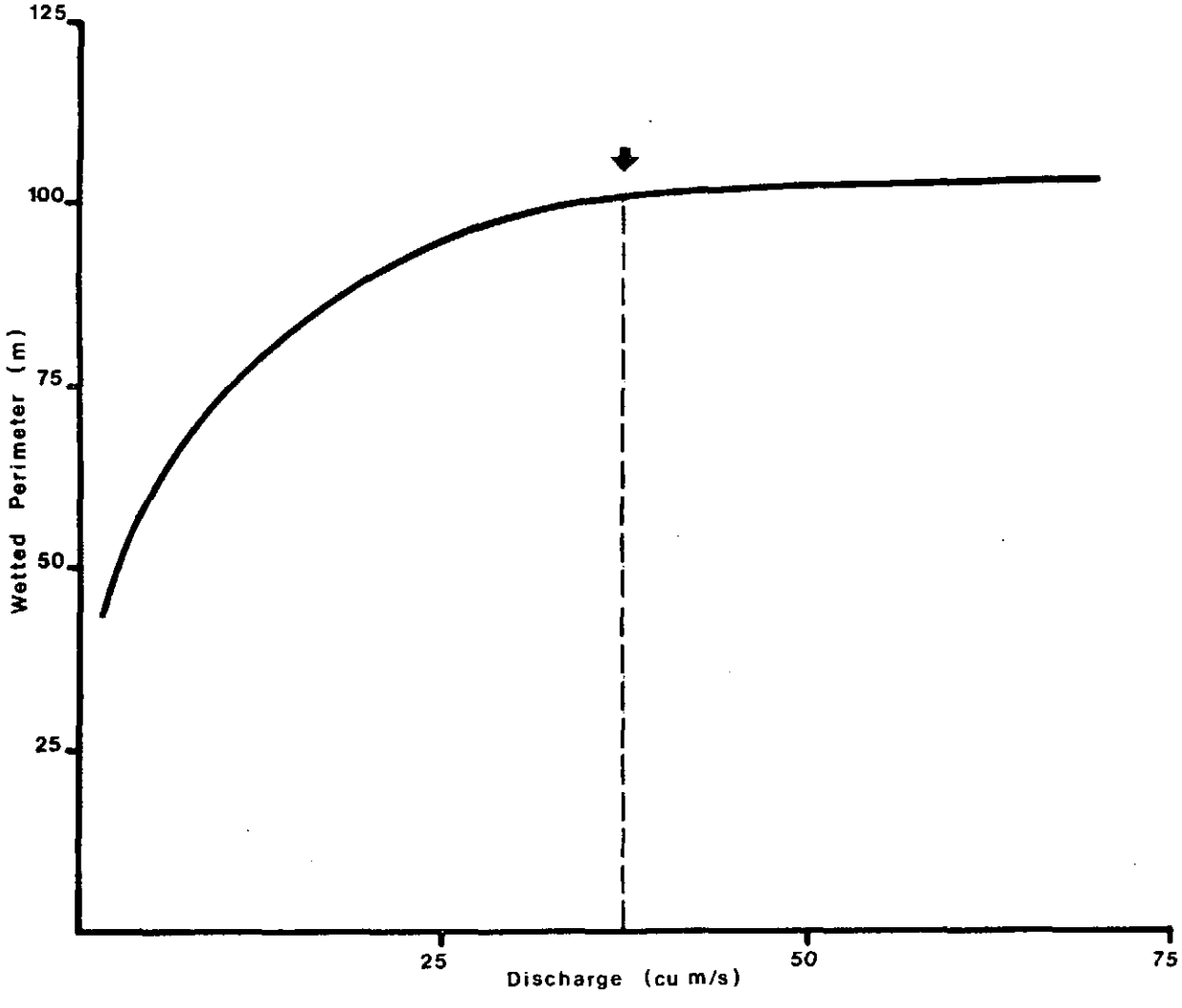


Figure 38. Rearing flow curve for main Snake River below Tilden Bridge.

Submitted by:

Tim Cochnauer
Senior Fishery Research Biologist

and

Edwin Buettner
Biological Aide

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

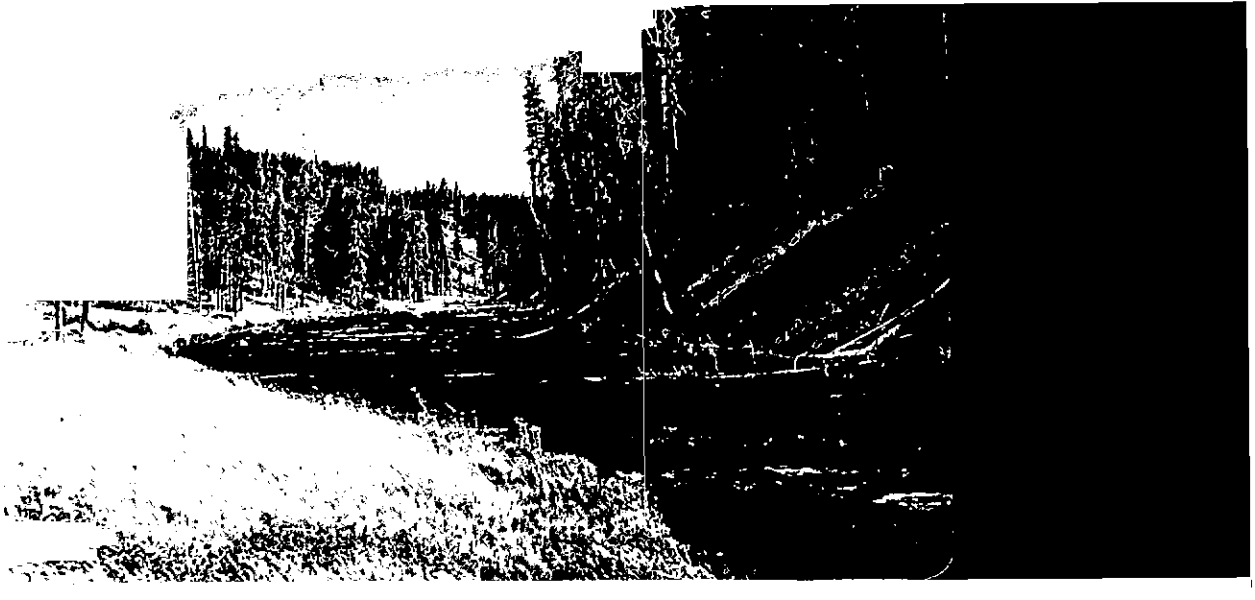
Joseph C. Greenley, Director

Stacy Gebhards, Chief
Bureau of Fisheries

Jerry Mallet
Fishery Research Supervisor
Bureau of Fisheries

Linda –
P/Z file in
Warm R. file
with exhibits
Dave

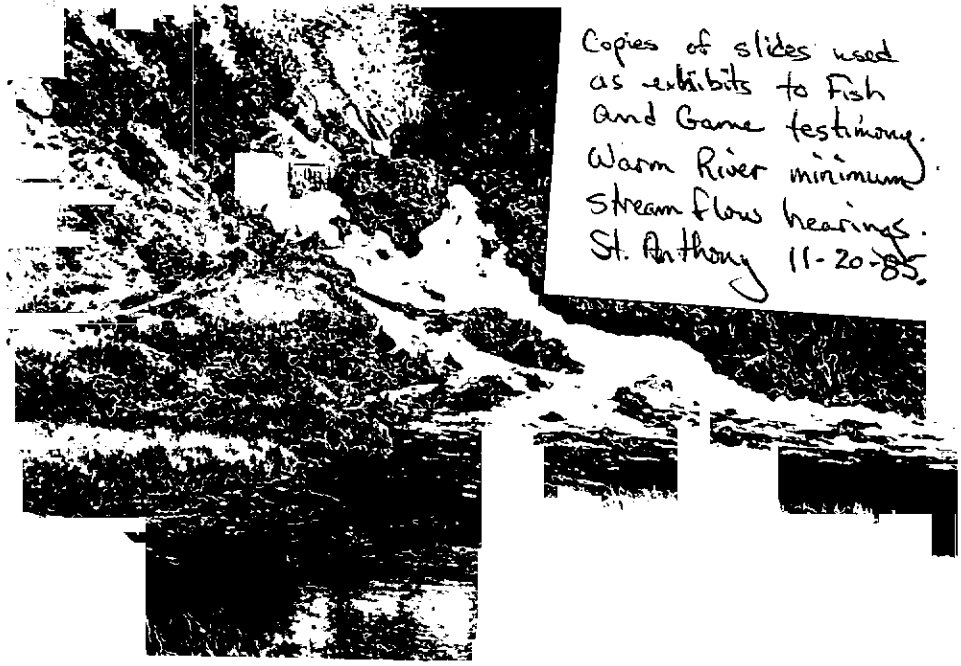
Send to:
~~Kenneth Dunn~~
Dave Tuthill
Water Resources Dept
State House
Boise, ID



Fish and Game Exhibit &
Warm River below Cascades



Fish and Game Exhibit 9
Warm River Below Cascades
21-7283

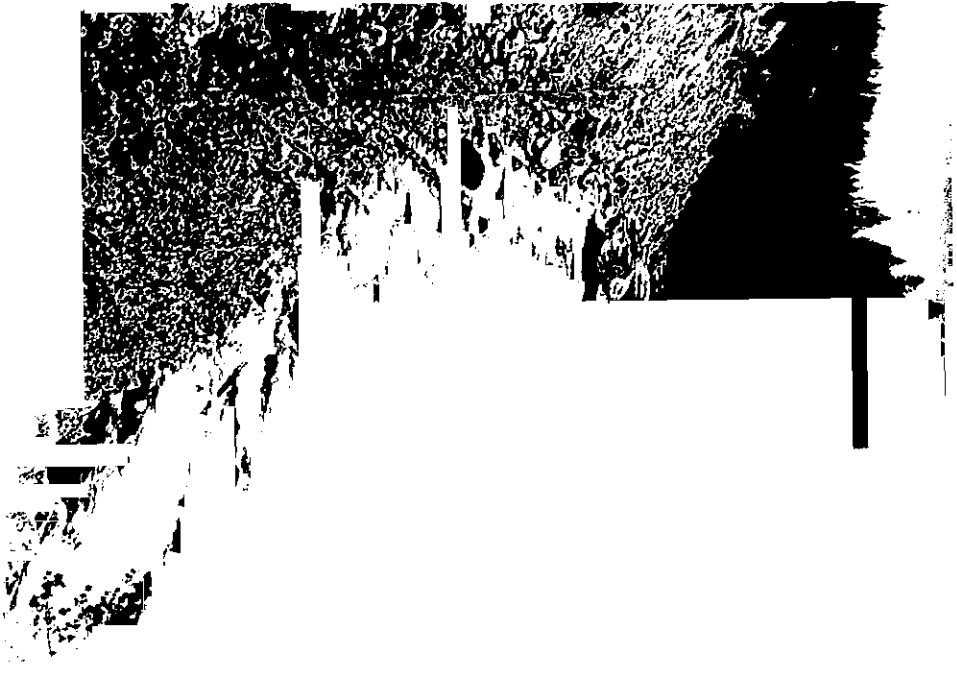


Copies of slides used as exhibits to Fish and Game testimony. Warm River minimum stream flow hearings. St. Anthony 11-20-85.

Fish & Game
Exhibit 4
Warm Springs ≒ 200 cfs
Warm River



Fish & Game Exhibit 6
Warm River above cascades



Fish and Game Exhibit 7
Warm River at Cascades



Fish and Game Exhibit 10
Warm River near Highway 47
(near mouth)



Fish & Game Exhibit 5
Warm River downstream of
Springs

POPULATION ESTIMATES

LOCATION	DATE	METHOD	# TROUT/KM	SF DNR
Polebridge Campground GAWS	7/26/83	3-Pass	392	44% brook, 24% [illegible] 32% hatchery
	8/7-10/84	Mark-recapture	589	58% brook, 26% hatchery [illegible] 2% wild rainbow
GAWS above springs	7/27-29/83	Mark-recapture	400	48% brook, 36% wild rainbow, 12% brown, 3% hatchery rainbow
	8/7-10/84	Mark-recapture	208	42% brook, 32% wild rainbow, 19% hatchery rainbow, 5% [illegible] 1% brown
At Twisted Draw	8/28/84	Snorkel	1226	97% rainbow, 2% brook, <1% brown
Above cascade	8/3/82	Snorkel	1619	98% rainbow, 1% brook, <1% brown
	3/21/83	"	955	96% rainbow, 4% brook
	8/31/83	"	1866	97% rainbow, 3% brook, <1% brown
	7/18/84	"	954	95% rainbow, 5% brook
	8/28/84	"	1573	94% rainbow, 5% brook, <1% brown
Below cascade	8/30/83	Snorkel	380	100% rainbow
	7/18/84	"	235	99% rainbow, 1% brook
	8/29/84	"	1370	95% rainbow, 5% brook
Above Warm River Campground	7/19/84	Snorkel	563	97% rainbow, 2% brown, <1% [illegible]
Fish Creek bridge to Three Rivers Ranch[1]	7/2-12/84	Mark-recapture	605	46% wild rainbow, 33% brown, 18% hatchery rainbow

Fish and Game Exhibit 11
Data slide with 1984
population index summaries.
Warm River.

MINIMUM STREAM FLOW
FACTS

Water Right No.: 21-7283

Source: Warm River

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: June 19, 1981

Rate of Flow: 141 cfs

Location: From the confluence with the Henry's Fork upstream about 1/2 mile to State Highway 47.

Purpose: To maintain high quality fisheries and spawning and rearing habitat.

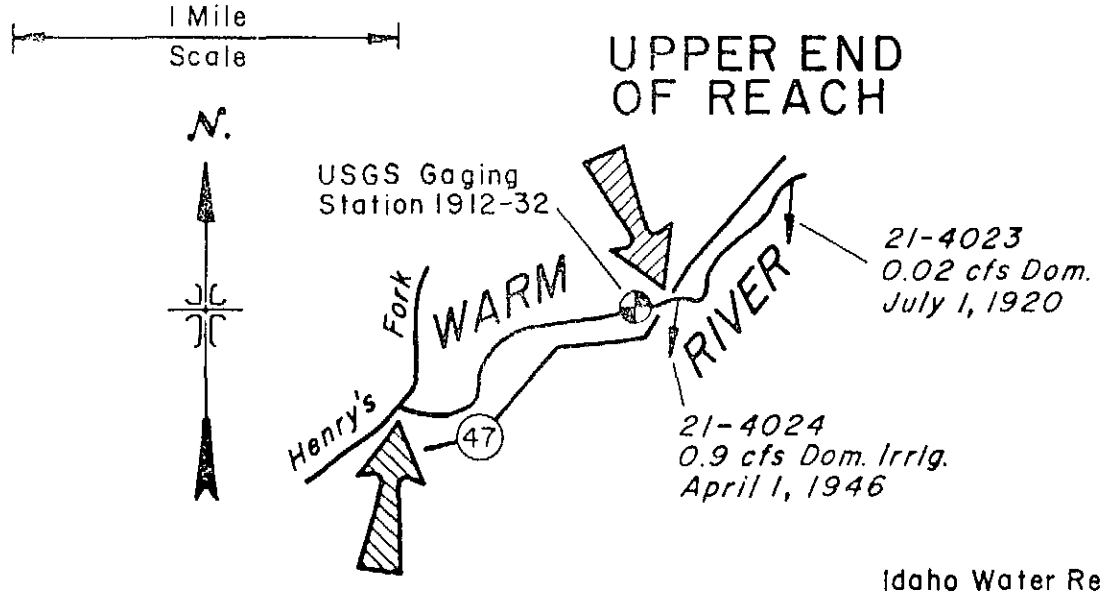
I DWR STAFF
EXHIBIT #1

MICROFILMED
JAN 06 1989

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JAN 06 1989
IDWR STAFF
EXHIBIT #2

Minimum Stream Flow No. 21-7283

Warm River



Idaho Water Resource Board Filing: 141 cfs; June 19, 1981.

Water Right No.: 21-7355

Source: Warm River

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: September 27, 1984

Rate of Flow: 141 cfs

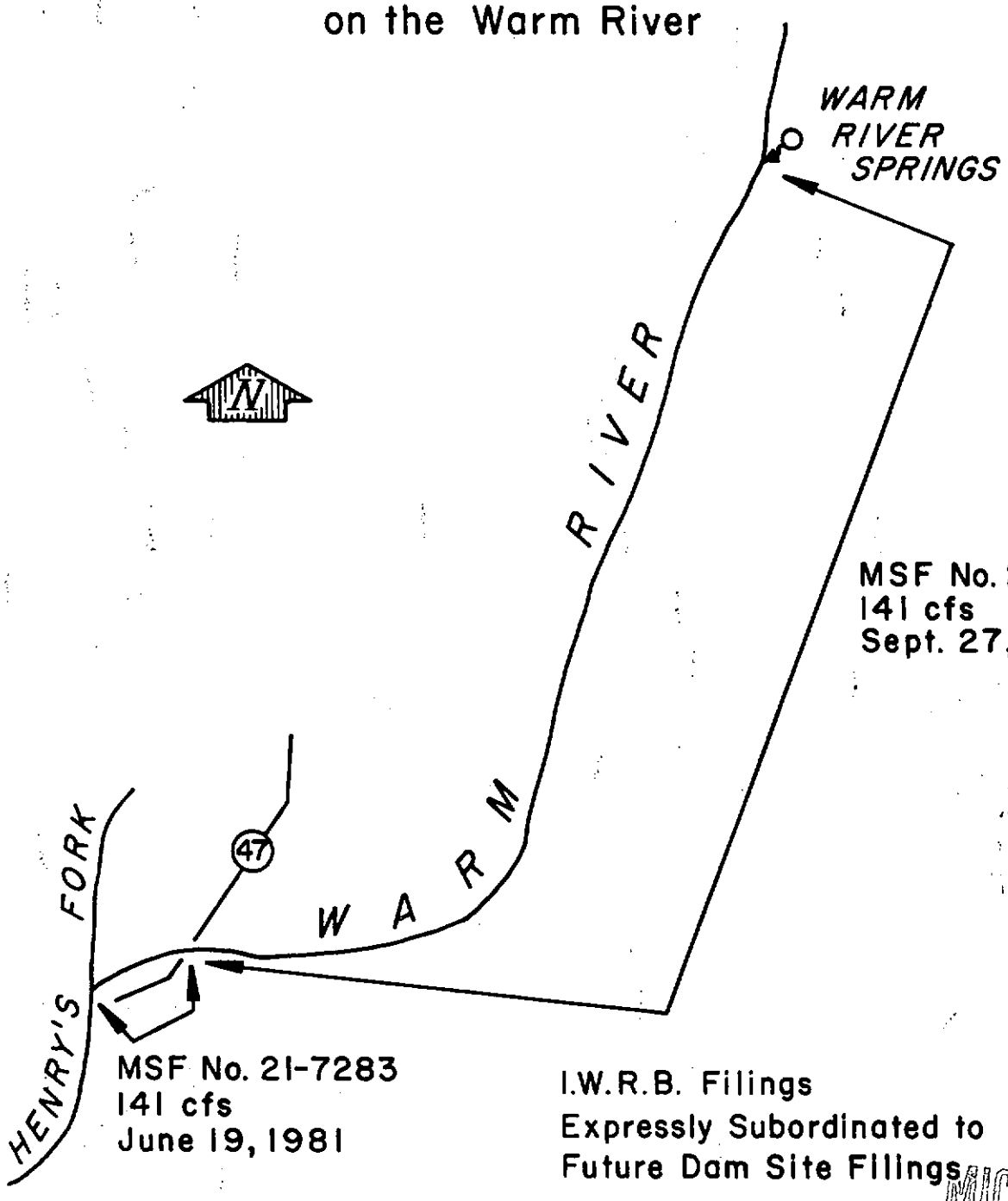
Location: From State Highway 47 upstream about 8 miles to Warm River Springs

Purpose: To maintain high quality fisheries and spawning and rearing habitat.

IDWR STAFF
EXHIBIT #3

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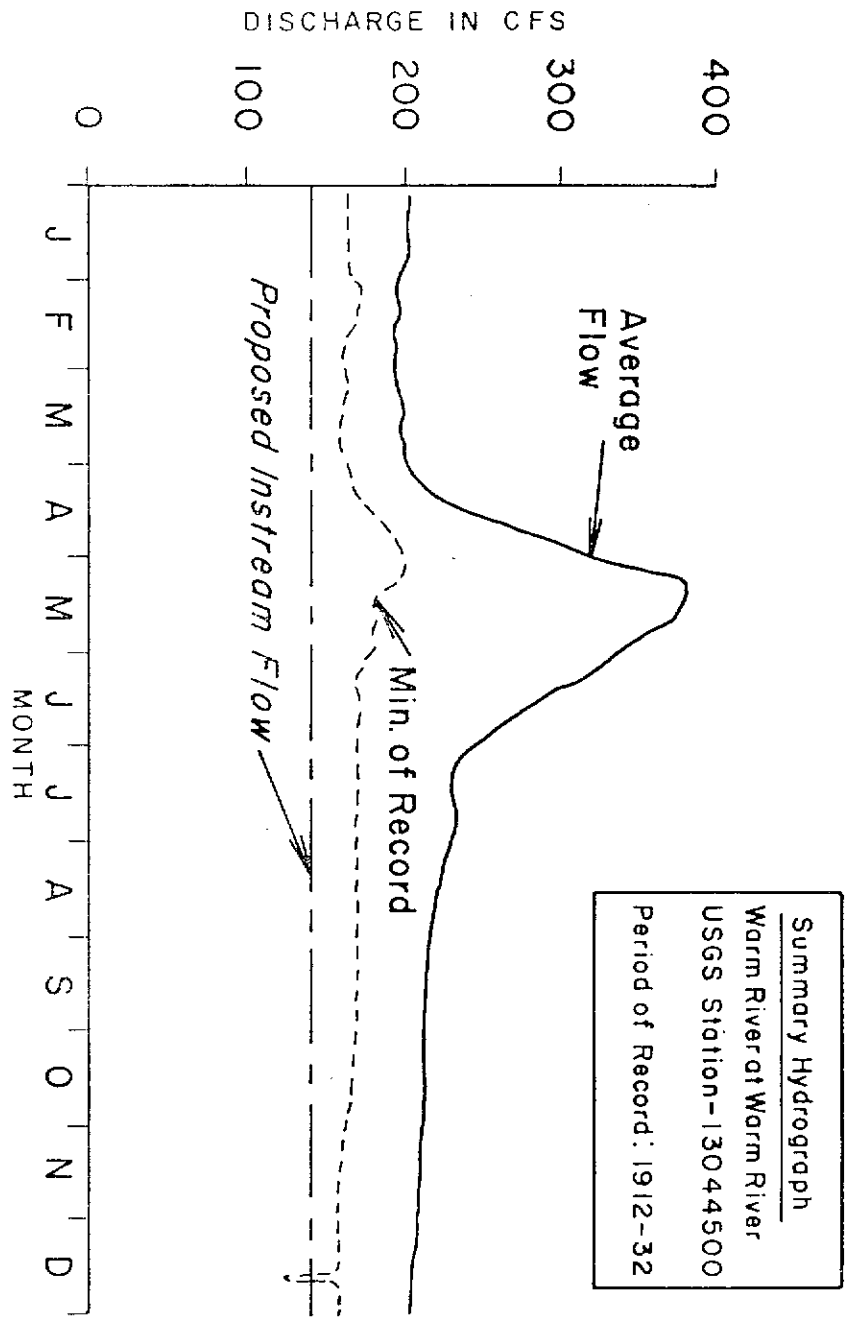
Minimum Stream Flow Applications on the Warm River



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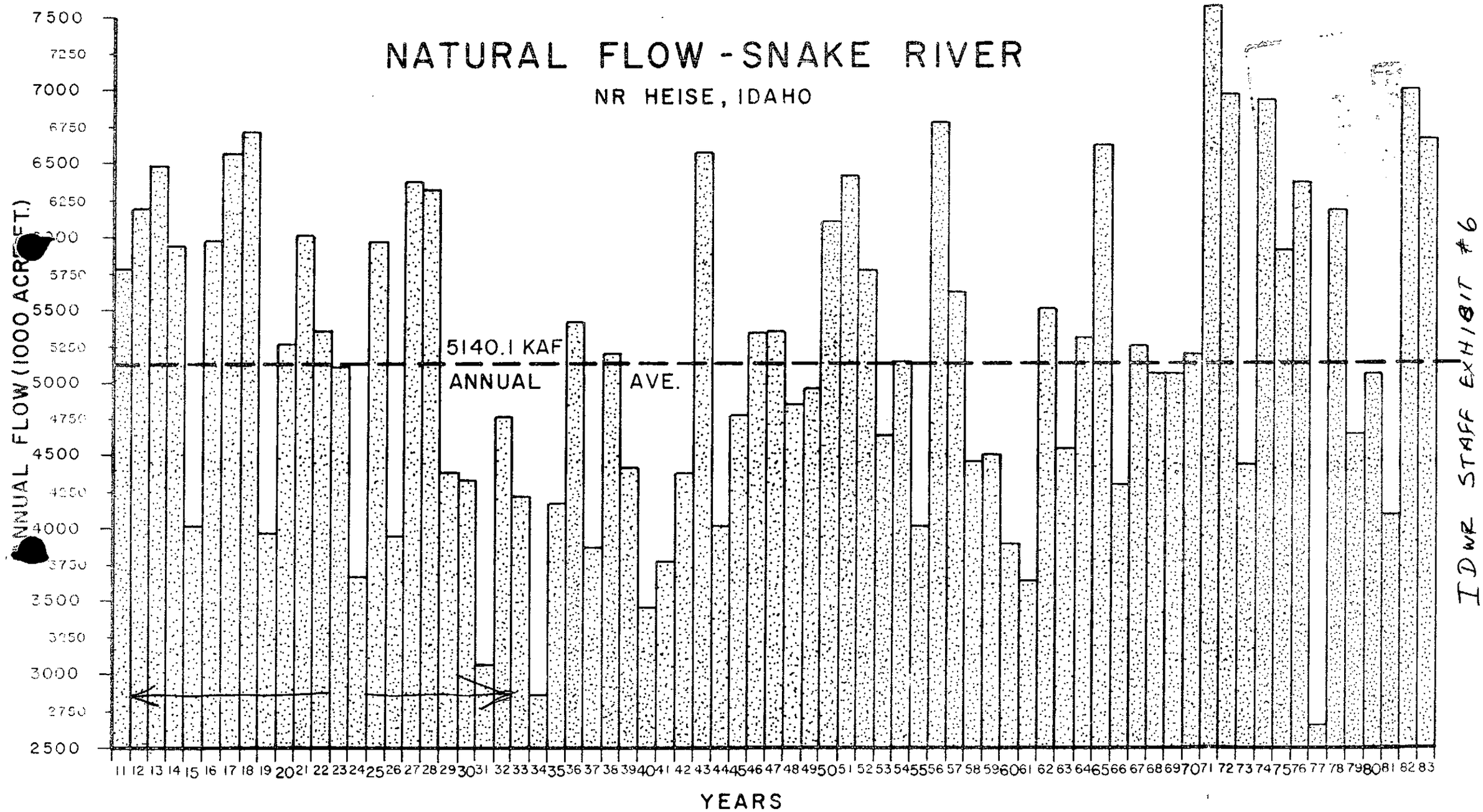
IDWR STAFF

EXHIBIT # 4



IDWR STAFF
EXHIBIT # 5

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NATURAL FLOW - SNAKE RIVER
NR HEISE, IDAHO
ANNUAL FLOW (1000 ACR FT.)
7500
7250
7000
6750
6500
6250
6000
5750
5500
5250
5000
4750
4500
4250
4000
3750
3500
3250
3000
2750
2500
5140.1 KAF
ANNUAL AVE.
11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
YEARS
IDWR STAFF EXHIBIT #6

WARM RIVER HYDROGRAPHIC INFORMATION

- Gage located at upper end of reach: period of record 1912 - 1932
- Large amount of baseflow provided by groundwater discharge
- Discharge was less than 141 cfs only 2 days in 21 years

IDWR STAFF EXHIBIT # 7

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FISH AND GAME
EXHIBIT #3
Admitted 11-20-85
SDF

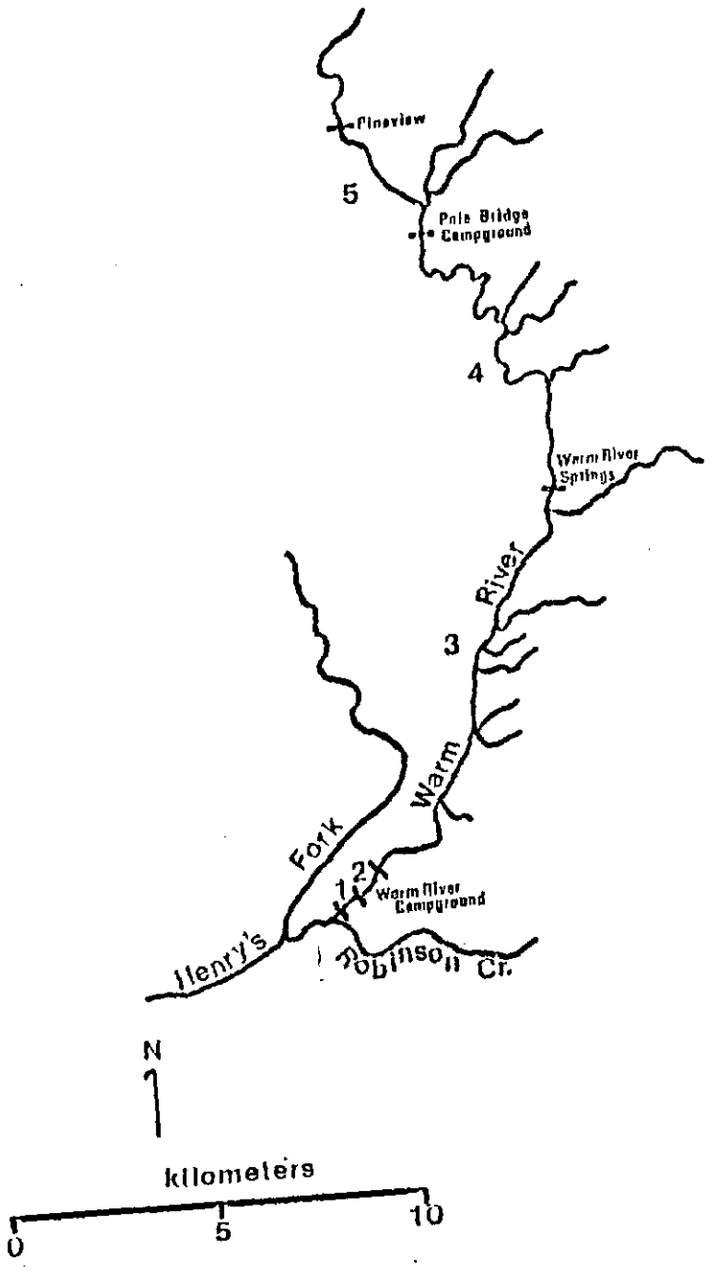


Figure 4. Map of Warm River showing creel census sections.

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Slides for MSF Hearing on Warm River
November 20, 1985

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FISH AND GAME
Ex. 12

Table 17. Means and range of game fish harvested by anglers in Warm River, 1984.

Species	Sample size	Mean length (mm)	Range
Hatchery rainbow trout	12	229	210-269
Wild rainbow trout	22	242	200-294
Brown trout	3	347	305-379
Mountain whitefish	1	305	--

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FISH AND GAME
EX. 13

Table 16. Summary of harvested and released fish by interval from Warm River, 1984.

Interval	Hrs. effort	Fish harvested							Fish released	Total
		WRB	HRB	HYB	BRK	BRN	MWF	Total		
5/26-5/31	1,013	61	162	0	0	20	20	263	405	668
6/1-6/30	2,780	167	250	0	0	83	0	500	2,808	3,308
7/1-7/31	1,869	542	897	56	0	93	0	1,588	561	2,149
8/1-8/31	1,722	706	431	0	52	52	0	1,241	758	1,999
9/1-9/3	614	264	86	0	0	0	0	350	424	774
Total	7,998	1,740	1,826	56	52	248	20	3,942	4,956	8,898
% of total harvest		44.1	46.3	1.4	1.3	63	0.5	100.0		
Fish/hr.		0.22	0.23	0.01	0.01	0.03	0.00	0.49	0.62	1.11

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FISH AND GAME
Ex. 14
Admitted 11-20-85
DDF

Tim Cochnauer
Principal Fishery Research Biologist
Idaho Department of Fish and Game
Lewiston, Idaho 83501

Education:

Bachelor of Science, University of Oklahoma, Norman, Oklahoma
Master of Scence, University of Oklahoma, Norman, Oklahoma
Doctorate Fishery Resources, University of Idaho, Moscow, Idaho

Instream Flow Experience

Idaho Department of Fish and Game: Project Leader, Instream Flow Investigations, 1974-79. Identified flow needs for fish and wildlife resources on approximately 100 streams or stream reaches in Idaho.

Idaho Department of Fish and Game: Project Supervisor, U.S. Bureau of Land Management Instream Flow Investigations. 1979-83. A four year study to determine instream flow needs on 60 streams located on BLM lands throughout Idaho.

Intragovernmental Personnel Assignment to U.S. Fish and Wildlife Cooperative Instream Flow Group, 1977. Assisted in development of new methodologies for determining instream needs for fish and wildlife.

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Conferences, Workshops, and Seminar Participation:

American Fisheries Society Instream Flow Needs Conference, 1976, Boise, ID

Pacific Fishery Biologists Instream Flow Session, 1976, Ocean Shores, WA

U.S. Fish and Wildlife Service Instream Flow State-of-the-Art Workshop 1975, Logan, UT

Idaho Water Resource Research Institute Instream Flow Seminar, 1978, Moscow, ID

U.S. Fish and Wildlife Service Instream Flow Conference, 1977, Boise, ID

U.S. Fish and Wildlife Service Instream Flow Computer Programs Workshop, 1977, Salt Lake City, UT

U.S. Fish and Wildlife Service Water Law Short Course, 1977, Fort Collins, CO

American Fisheries Society, Nevada Chapter, Instream Flow Seminar, 1977, Las Vegas, NV

Idaho Department of Fish and Game Instream Flow Training Workshop, 1981, Lewiston, ID

U.S. Fish and Wildlife Service Instream Flow Strategies and Applications Workshop, 1982, Portland, OR

U.S. Fish and Wildlife Service Instream Flow Group Training Session on Use of the Computer Based Physical Habitat Simulation System, 1984, Fort Collins, Co

U.S. Fish and Wildlife Service Training Workshop on Habitat Evaluation Procedures, 1985, Boise, ID

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JAN 06 1989

Publications and Articles

Bovee, K.D. and T. Cochnauer. 1977. Development and evaluation of weighted criteria, probability of use curves for instream flow assessments; fisheries. Instream Flow Information Paper No. 3. Cooperative Instream Flow Service Group, U.S. Fish and Wildlife Service. Fort Collins, CO.

Cochnauer, T. 1976. Idaho Department of Fish and Game instream flow program status. In: Instream Flow Needs and Competing Uses for Water. Proceedings of a Joint Water Resources Seminar of the University of Idaho and Washington State University.

_____. 1976. Stream resource maintenance flow studies, 1976. Job Performance Report. Idaho Department of Fish and Game.

_____. 1976. Instream flow techniques for large rivers. Instream Flow Needs, Vol. II, American Fisheries Society, 1976.

_____. 1977. Snake River stream resource maintenance flow studies, 1975-76. A report with recommendations to the U.S. Bureau of Reclamation, Boise Office. Idaho Department of Fish and Game.

_____. 1977. Stream resource maintenance flow studies, 1977. Job Performance Report. Idaho Department of Fish and Game.

_____. 1977. Stream resource maintenance flow determinations for Box Canyon Springs. Idaho Department of Fish and Game.

_____. 1977. Snake River (American Falls Dam to Lake Walcott) stream flow study, 29 October - 10 November 1977. Idaho Department of Fish and Game.

_____. 1980. Stream flow investigations. Job Completion Report. Idaho Department of Fish and Game.

_____ and E. Buettner. 1978. Stream flow investigations--stream resource maintenance flow determinations on Idaho streams. Job Performance Report, Project F-69-R-3, Job No. II. Idaho Department of Fish and Game.

_____ and W.D. Horton. 1981. A reference workbook for determining instream flow needs in Idaho. Idaho Department of Fish and Game.

_____ and N.R. Hoyt. 1979. Stream flow investigations--stream resource maintenance flow determinations on Idaho streams. Job Performance Report, Project F-73-R-1. Idaho Department of Fish and Game.

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JAN 06 1989

Cochnauer, T. and L.B. Mabbott. 1981. Instream flow study, Bureau of Land Management. Annual Report, April 1981. Idaho Department of Fish and Game.

_____ and R.G. White. 1975. Stream resource maintenance flow studies, 1975. A Cooperative Study; Idaho Department of Water Resources, Idaho Department of Fish and Game and Idaho Cooperative Fishery Research Unit.

Horton, W.D. and T. Cochnauer. 1979. Instream flow methodology evaluation, biological criteria determination, and water quality needs for selected Idaho streams. Stream Evaluation Project, Western Water Allocation Project, Contract No. 14-16-0001-77090. U.S. Fish and Wildlife Service.

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FISH AND GAME
EX. 16
(admitted as part of 15)
BDF

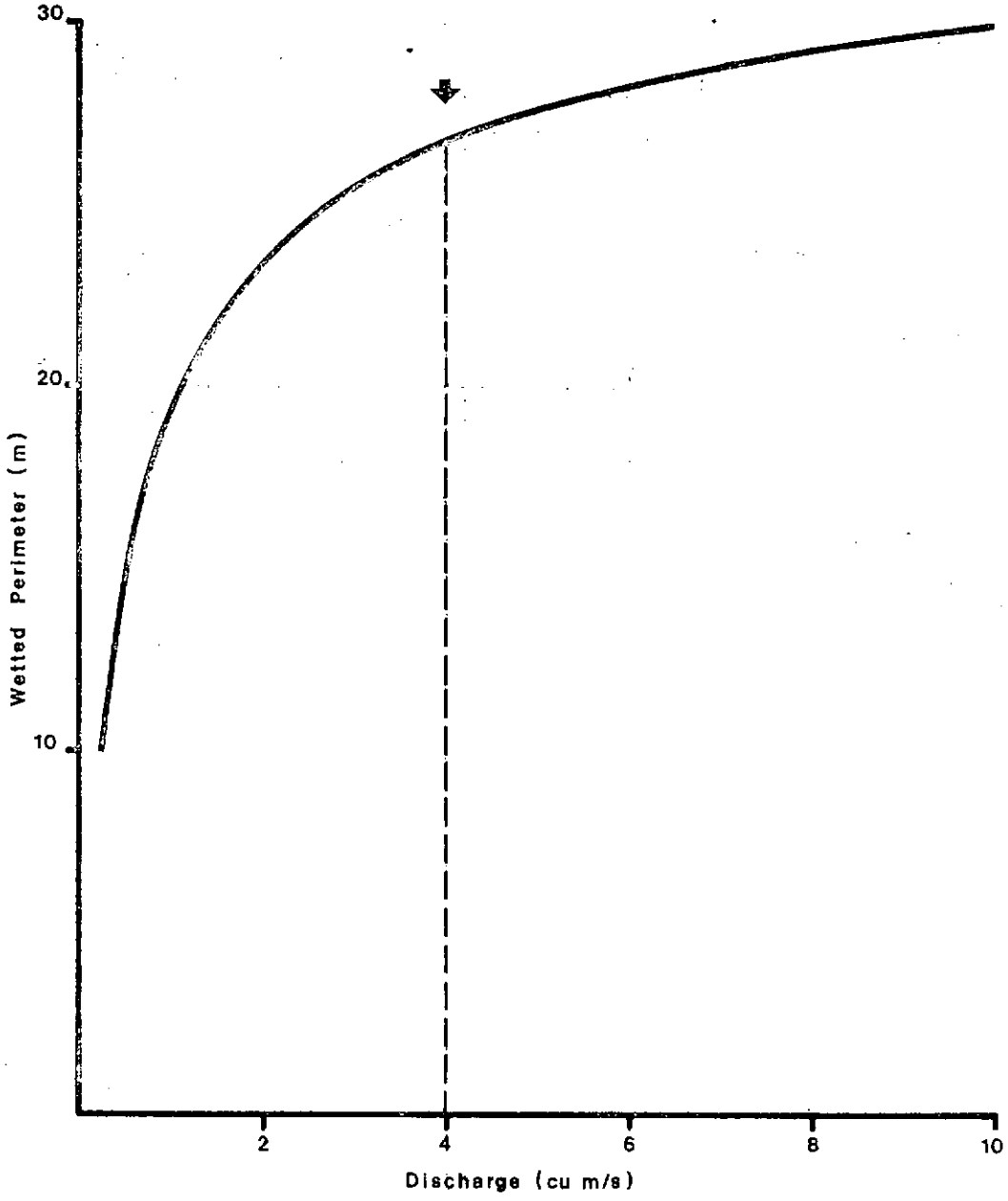


Figure 31. Rearing flow curve for Warm River downstream of Robinson Creek.

MICROFILMED
JAN 06 1989

ATTENDANCE ROSTER

IDAHO WATER RESOURCE BOARD PUBLIC MEETING ON MINIMUM STREAM FLOW APPS NOS. 21-7281, FALL RIVER, AND 21-7283, WARM RIVER

NAME	ADDRESS	REPRESENTING
Reed Oldham	R.F.D. Box 297	
Leigh Chantrell	Newdale Idaho	
LOREN B. KAUER	RT.#4, Rexburg, Idaho	FREMONT MADISON Irr. Co.
Sherman & June Hess	Ashton, Idaho	Fremont, Madison Irr.
Ivan Crouch	Ashton, Idaho	Fremont - Farmers Canal
Ruth Crouch	Ashton, Idaho	
Joyce Hunt	St. Anthony	Standard-Journal
Martin Bergmann	Ashton Ida.	Squirrel Creek Dry Farm
Ralph W. Moon	Rt 1 Box 191-3	St Anthony
Orin Garry	R#2 Box 111	St. Anthony
Norman Williams	~~Box~~ Box 208	Ashton
Lowell Rich	R.F.D.	Ashton
J. D. Stewart	Rt. 1	Ashton
Preston Atchley	RT 1 Box 9	ashton
Dale L. Swenson	Box 5 St. Anthony	Fremont-Madison Irrig. Dist
J. Max Mortensen	RT 3 Box 87 Rexburg	" "
Ray L Pocock	Sugar R.1.	East Teton Canal (Fall River)
Bryant L. Christensen	420 N. Bridge, St. Anthony	U.S. Forest Service
Jay A Sutton	718 W 4th St. Anthony	P. Commissioner
Stan Hawkins	Box 367	Ucon Idaho
Mark L Ricks	RR 4 Box 173	Rexburg
Ralph D. Miller	Box 92	Chester Idaho Chester Canal
Delila Terry	Box 172	Ashton Ida
Kenneth Winterfeld	250 St. Anthony	Sportsman
Max E Ottesen	Rt. 1 Sugar city Ida	Teton Mfg Co.
W. Dean Graham	Rt. 1 Sugar city Ida.	Teton Irrig & Mfg. Canal Co.
James Sidlowsky	Teton, Idaho	Enterprise Irrig Dist.
Jim Sidlowsky	Teton, Idaho	Enterprise Irrig. Dist.
Elmer J. Kleist	Teton	Point
Norval Birch	St Anthony Id.	Stewart Canal Co.
Max Siddoway	Teton	East Teton Canal Co.
Boris V. Blanchard	Chester	Curr & McBee
Glen Gordon	Ashton	Marysville Irr. Co.

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JAN 05 1989

Earl J Potter Chester, Idaho Cir Canal Alma Ditch
K.K. Egbert Ashton Emmett Mad and Mayfield
Doug Hillam Ashton
Leon Martindale RR 2 Ashton
Ashton

Jay - Hill Ashton Court Circuit Court out of Fall River

Cathy Koon St. Anthony Post-Register
DON KRAMER CASTLEFORD IWRB

MICROFILMED
JAN 05 1989

MICROFILMED
JAN 05 1989

NOTICE OF PUBLIC MEETING

SEP 10 1984

Department of Water Resources

Notice is hereby given that an informal public meeting will be conducted by the Idaho Water Resource Board on Wednesday, September 26, 1984 at 7:30 p.m. in the Courtroom, Fremont County Courthouse, St. Anthony, Idaho to receive comments on minimum streamflow applications as follows:

No. 21-7281 proposing the appropriation of 140 cfs of water from Fall River tributary to Henry's Fork Snake River. The location of the reach is the NE¼SE¼, Sec. 14, T. 8N, R. 41E, upstream approximately 8 miles to State Highway 32 in the SE¼NW¼, Sec. 18, T. 8N, R. 43E.

No. 21-7283 proposing the appropriation of 141 cfs from Warm River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NW¼, Sec. 13, T. 9N, R. 43E, upstream approximately 1/2 mile to State Highway 47 in the SW¼SE¼, Sec. 12, T. 9N, R. 43E, B.M., both in Fremont County.

On Thursday, September 27, 1984 at 7:30 p.m. in the Courtroom, Teton County Courthouse, Driggs, Idaho an additional public meeting will be held to receive comments on minimum streamflow applications as follows:

No. 22-7369 proposing the appropriation of 106 cfs from the Teton River tributary to Henry's Fork Snake River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 9 miles to State Highway 33 in the SE¼SW¼, Sec. 23, T. 6N, R. 44E.

No. 22-7370 proposing the appropriation of 28 cfs from Bitch Creek tributary to Teton River. The location of the reach is the NW¼NE¼, Sec. 20, T. 7N, R. 44E, upstream approximately 6 miles to State Highway 32 in the NW¼NW¼, Sec. 17, T. 7N, R. 45E, B.M., both in Teton County.

All of the above applications were filed to protect the quality of the fisheries habitat within the specified reach on each stream.

MICROFILMED

JAN 05 1989

A. KENNETH DUNN
Director

Published in the Ashton Herald, Fremont County Chronicle, Post Register, Teton Valley News on September 13 and 20, 1984.

DEPARTMENT OF WATER RESOURCES

State of Idaho, Statehouse, Boise, Idaho 83720
Phone: (208) 334-4440

FOR IMMEDIATE RELEASE

September 12, 1984

NEWS RELEASE

BOISE--- The Idaho Water Resource Board (IWRB) will conduct two public information meetings in eastern Idaho this month to discuss proposed minimum stream flow applications on file with the Idaho Department of Water Resources (IDWR.)

The Wednesday, Sept. 26 meeting at the Fremont County Courthouse, court room, St. Anthony, at 7:30 p.m. will deal with two proposed instream flow applications on Fall and Warm Rivers.

The Thursday, Sept. 27 meeting at the Teton County Courthouse, court room, Driggs, at 7:30 p.m. concerns Teton River and Bitch Creek instream flow applications.

All four applications were filed on June 19, 1981, at the request of the Idaho Department of Fish and Game. The applications, which seek year-round protection of fisheries and spawning and rearing habitat, provide for the following rates of flows and locations:

Fall River---140 cubic feet per second (cfs) from Highway 32 downstream about eight miles.

Warm River----141 cfs from Highway 47 downstream about 1/2 mile.

MICROFILMED
JAN 05 1989

more

Teton River---106 cfs from Highway 33 downstream about nine miles.

Bitch Creek---28 cfs from Highway 32 downstream about six miles.

As required by law, if the Idaho Water Resource Board finds the proposed minimum stream flows to be in the public interest, the Idaho Department of Water Resources will conduct public hearings on the applications later in the year. After the hearings, the applications will be reviewed by the Director of the Department, for approval or denial. If approved, the applications must be sent to the Idaho Legislature, which may approve or reject them.

The public is encouraged to come and let the Idaho Water Resource Board know how it feels about any or all of these proposed instream flow rights, which, if approved, would be junior to any other established rights on the streams. These minimum stream flow rights also would not in any way affect any earlier, existing rights.

-30-

JAN 15 1990

OK WATER RIGHT NUMBER 21-7283

OWNER LAST NAME - STATE OF IDAHO FIRST NAME - ORIG OWNER -
ADDRESS LINE 1 - IDAHO WATER RESOURCE BOARD ADDRESS LINE 2 - STATEHOUSE
ADDRESS LINE 3 - CITY - BOISE STATE - ID ZIP CODE - 83720
SOURCE - WARM RIVER TRIBUTARY OF - HENRYS FORK
STAGE - APPLICATION STATUS - PRIORITY - 06-19-1981 COUNTY - FREMONT TOTAL DIV. RATE - 141.0000 -CFS
TOTAL DIV. VOLUME - .00 AFA TRFR/AMEND - WATER DIST. - 01 DLE/CAREY ACT - RIGHT BASIS -
DIVERSION POINT - NWNW 13 09N 43E LOT REDIV - 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
SWSE 18 09N 43E LOT REDIV - 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
FROM - 01-01 TO - 12-31 USE - MINIMUM INSTREAM FLOW USE DIV. RATE - 141.0000 CFS USE DIV. VOLUME - .00 AFA
USE - MINIMUM INSTREAM FLOW PLACE OF USE - TWN 09N RNG 43E SEC 13 TRACT NWNW LOT AC
DECREE NAME - DATE - TOTAL ACRES 0
REMARKS - P/D'S ARE LOCATION OF REACH.
NON IRRIG USE - M/MAINTAIN FISHERY HABITAT.
OTHER RIGHTS FOR SAME USE -
PROOF DUE - PERMIT/DENIED - PROTESTED - HEARING - OLD NO. -
PROOF MADE - FLD EXAM - COND. OF APPROVAL -
DIVERSION MEANS - GAGING STATION.

RECEIVED
OCT 29 1984
Department of Water Resources

Kenneth Dunn
Idaho Dept. of Water Resources
State House
Boise, Id. 83720

Dear Mr. Dunn,

We would like to express our support for the proposed minimum stream flows on the Teton, Bitch, and Fall and Warm Rivers. We understand that these minimum flows, proposed by Fish and Game, do not effect present water rights. There is a need in this area to protect present fish habitat from further irrigation and hydro projects. We ~~both~~ enjoy fishing in this area and there are a number of recreationali that fish in this area. We feel the public in Idaho should begin to ~~look~~ look to the future in protecting our recreational lands and rivers from unnecessary developements.

JAN 05 1989

Sincerely
Hobart and Martha Collin
Box 124
Driggs, Id. 83422

Oct. 28, 1984

Kenneth Dunn, Director
Idaho Department of Water Resource
State House, Boise, Idaho

RECEIVED
OCT 30 1984
Department of Water Reso

In re: Minimum Stream Flows on the Teton

Dear Sir:

My husband and I are watching Idaho's handling of their precious resources with keen interest. Since moving here from the Denver area where we can no longer see the Milky Way nor breathe pure air, we hope our adopted state will be able to preserve the high quality of its air, water, and wild life.

The Teton River can become one of the premier trout streams in the United States making this area desirable for fishermen who will travel great distances for the pleasure and excitement of experiencing "class" fishing and in the process stimulate and generate business wherever they go. Dry fly fisherman, in particular, make agreeable guests for our state as they are generally considerate of the environment.

The establishment of minimum stream flows to preserve fish habitates and spawning grounds will allow our fish harvest to flourish and will protect the critical streams, i.e., Bitch Creek, etc., from further future irrigation and hydro projects.

We hope you will consider with care the Idaho Fish and Game Department's proposal to establish minimum stream flows on the Teton River below Route 33. With thoughtful study and wisdom both agricultural and environmental interests should be balanced.

Very truly yours,

Victoria Ruwitch

Victoria Ruwitch
Rt 1, Victor, Id.

MICROFILMED
JAN 05 1989

Federation of Fly Fishers

October 28, 1984

Gene Gray
Vice Chairman
Idaho Water Resource Board
Statehouse
Boise, ID 83720

Dear Mr. Gray:

My name is Buck Goodrich and I am president of the Western Rocky Mountain Council of the Federation of Flyfishers. I live in Shelley, Idaho and I am writing to express my support for minimum flows on the Fall, Warm and the Teton Rivers and Bitch Creek.

I think it is about time that minimum flows are established on these streams. We believe that water useage must include recreational and esthetic uses as well as agriculture. The econonmics of non agriculture use of water are becoming very large. Favoring just one industry is not correct. I especially believe this when agriculture is so heavily subsidized as it is today. The fishing industry pays it's own way and should not be penalized because it is non agriculture. We believe in multiple use but apparently the agriculture interests do not. The beauty and satisfaction of seeing a free flowing stream warms the hearts of most people.

Thank you for your time. I hope you will consider my ideas and march forward with the only logical decision that can be made on the above minimum flows. I guarantee you we have many members who support such a decision. If you need more support for this decision please let me know. We can supply numbers.

Yours Truly,

Buck Goodrich

L.D. "Buck" Goodrich
Rt. #2 Box 360
Shelley, ID 83274

MICROFILMED
JAN 05 1989

WRMC WESTERN ROCKY MOUNTAIN COUNCIL

RECEIVED
OCT 22 1984

291 Dale Drive
Idaho Falls, ID 83402
October 18, 1984

Mr. Gene Gray
Vice Chairman
Idaho Water Resource Board
Statehouse
Boise, Idaho 83720

Dear Sir:

I am writing to you because of my concern for the future importance of instream minimum flows to the economy of Fremont County. Sustaining cold water fisheries by assigning instream minimum flows will guarantee a future source of tax revenue and private income for the county as recreationists seek quality fisheries in the future.

It is well known that the amount of quality cold water fisheries habitat is decreasing throughout our country. However, those within and outside our state seeking cold water fisheries as a source of recreation are increasing. Thus those who are economically dependent on these fisheries stand to benefit from the increased rate of future demand. I thus urge you and members of the Water Resource Board to assign, as requested by the Idaho Department of Fish and Game, minimum instream flows from unappropriated waters for the purpose of cold water fisheries maintenance to these streams:

Falls River
Teton River
North Fork of Teton River
Warm River and
North Fork of the Snake River.

I urge this action as an owner of agriculturally zoned land in Fremont County (NE¼ N of River less Hwy Sec 3 Twp 8 Rge 43) and with the realization that this action will not violate earlier water rights on these streams.

Sincerely,

Bruce A. Staples

Bruce A. Staples

BAS:cs

MICROFILMED
JAN 05 1989

EASTERN IDAHO GROUP
SIERRA CLUB

RECEIVED
OCT 1? 1984
Department of Water Resources

Conservation Chair
1636 South Fairway Drive
Pocatello, Idaho 83201
(208) 232-9159

October 10, 1984

Mr. Kenneth Dunn, Director
Idaho Department of Water Resources
State House
Boise, Idaho 83720

Dear Mr Dunn:

The Eastern Idaho Group, Northern Rockies Chapter of the Sierra Club supports the minimum stream flow proposals by the Idaho Department of Fish and Game for Falls River, Warm River, Teton River and Bitch Creek.

It is obvious that the proposed minimum stream flows are necessary to protect vital habitat for native trout, and certainly this is the basis for them. Mr. Arkooshes remark at the Driggs meeting about "locking up the streams" was totally without basis. The four streams in question are the life-blood carriers for Henry's Fork. Despite Mr. Siddoway's remarks about the effect minimum stream flows might have on Fremont County's economy, he should know that recreational use of his county's rivers and streams--particularly their fisheries--are critical to Fremont County's economy.

We Understand the concern of Fremont County irrigators, and feel that in no way would minimum stream flows threaten their livelihoods, indeed, they can only assure the long-term survival of the region's economy.

Please enter this correspondence into the official record of the proceedings.

Yours very truly,

George Wentzel

George Wentzel

RECEIVED
JAN 05 1985

"Not blind opposition to progress, but opposition to blind progress."

21-728

OCT 10 1984

Department of Water Resour

30 Sept. 1984

Mr. Gene Gray,
Vice Chairman
Idaho Water Resource Board
Statehouse
Boise, Idaho 83720

Dear Mr. Gray,

I am writing to urge you and all of the members of the Idaho Water Resource Board to consider favorably the request by the Idaho Department of Fish and Game for minimum streamflows on the Falls River and Warm River.

At the public hearing held in St Anthony on Thursday, emotions were running high and there appeared to be a lack of understanding of the provisions of the Minimum Streamflow Law which contributed to the near explosive nature of the meeting. The majority of those in attendance seemed resolutely opposed to the department's proposal, but the reasons appeared to stem from a native antipathy towards the Department of Fish and Game and from a seemingly unwarranted fear by those opponants of a trespass against their water rights. Since, by law, earlier water rights on the Falls River have priority over the instream flow request, and, certainly, since emotional arguments founded in earlier disputes with the Department of Fish and Game can have no rational bearing on the issue before your board, the facts become simpler to adjudicate. The fishery on the lower Falls River is in trouble now. The excessively low flows of late summer and fall can, will, and most likely already have caused aquatic life loss from loss of habitat and increased water temperatures. The request for the instream flow by the Department is reasonable, necessary, and entirely justified despite the vociferous opposition.

Certainly, no rational person can deny the needs and rights of those who depend upon irrigation water from the Falls River for their livlihood, but by the same token, the rights and needs of the people of the State of Idaho, visitors from other states and those who depend upon the income from tourists and fishermen must be considered, too. Their right to unallocated water is just as cogent, if not more so, than the rights of those with prior water rights.

I hope, Mr. Gray, that the decision of the Board will be based upon reason and rationality and not upon emotion and the weight of numbers.

For the record, I am writing not only as a concerned private individual, but as a representative of the Upper Snake River Chapter of Trout Unlimited and as a Director of the Federation of Fly Fishers.

Thank you for your consideration,

Ralph W. Moon

Ralph W. Moon
Rt. 1 Box 191-3
St Anthony, Idaho 83445

JAN 05 1989

THE FLYFISHER

The Magazine of The Federation of Fly Fishers

RECEIVED
OCT 9 1984
Department of Water Resources

DENNIS G. BITTON, EDITOR
1387 CAMBRIDGE DRIVE
IDAHO FALLS, ID 83401
(208) 523-7300

21-7281

October 3, 1984

Mr. Gene Gray
Vice Chairman
Idaho Water Resource Board
Statehouse
Boise, Idaho 83720

Dear Mr. Gray:

I'd like to express an opinion on the State Fish & Games' request for minimum stream flow requests on a few eastern Idaho waterways. Knowing the individuals at the Fish & Game, as well as the streams involved, I would strongly suggest that you follow their recommendations.

For too many years, Idahoans have looked at water as something to irrigate with, run an industrial plant with, or to power turbines. The rights of the fish have been ignored. Notice that I said the rights of the fish, not fishermen.

Trout in a stream are like the proverbial canary in the miner's tunnel. If they die, it's a signal to the humans. I'm fourth generation Idahoan, and I consider it my duty to protect the quality and quantity of our streams so that my grandchildren can enjoy them like I do. We won't be able to do that without non violatable minimum stream flow packages. The farmers and ranchers are out of line. It's not their water. They merely have the right to use some of the water, and they shouldn't be allowed to use it to anyone else's detriment, especially the fish.

I've seen streams dried up, with fish dying, and irrigation canals filled to overflowing right next to it. They waste water; a lot of it. That need to be changed. Please support minimum stream flow requests on any stream that has trout in it. If we don't our grandkids will have nothing but paved canals to look at.

I could say more, but I believe you get my meaning. Please contact me if I can be of any assistance in any way.

Tight Lines,

Dennis G. Bitton

DGB:jh

Dennis G. Bitton

MICROFILMED
JAN 05 1989

3/83

IDENT. NO. 21-7283

IDAHO DEPARTMENT OF WATER RESOURCES

WATER RIGHT DATA ENTRY LOG

Initials	Date	Item
		Original form entered
		Edit Report Correct
		Date Protested
		Date of Hearing
		Date Approved/Denied (Proof due date, stage and/or status, conditions of approval, water district)
		Record Verified
		Amendment Approved
		Extension Approved
		Partial Proof
		Proof Complete
		Field Exam Received
		Field Exam Accepted and changes entered
		License Updated
		Transfer Updated
		Keypunched by State Office
G	G	DEC 28 1983 VERIFIED

October 30, 1984

Idaho Dept. of Water Resources
Kenneth Dunn, director
State House
Boise, ID 83720

RECEIVED
OCT 31 1984
Department of Water Resource

Dear Mr. Dunn,

I am writing to inform you of my support for the minim stream Flows on the Teton River as proposed by the Idaho Fish and Game Department. As I understand, Bitch Creek, Fall River, Warm River, and Badger Creek will b affected by a minimum stream Flow decision. Two of these, Badger Creek and Bitch creek, are prime spawnir grounds for the Teton River. I also understand that the proposed minimum Flows would not supercede existing water rights of area farmers and developers. Therefore it seems to me that by adopting these minimum Flows we can protect and possibly even improve the unique Teton River ecosystem, yet not infringe on the existing rights of irrigators and hydroelectric energy suppliers.

JAN 05 1989

The Teton River represents a truly unique habitat for fish, waterfowl and at one time served as the cente of an important moose, elk, and deer winter range. A River that can boast being home to quality trout, sandhill cranes (even an occasional Whooper!), Canadian geese, 200+ Trupeter swans, and ducks of all sorts Is not commonplace! I feel the value of the Teton River and its tributaries as habitat For these animals far outweighs the value of any additional

use of the river for irrigation and hydroelectric power plants.

I urge you to adopt the minimum stream flows for the Teton River as proposed by the Idaho Fish and Game, and support efforts for establishing additional minimum flows for the River and its tributaries above Highway 33.

Sincerely,

Claire Lavendel
Box 591
Driggs, ID 83422

JAN 1993

RECEIVED
NOV 1 1984
Department of Water Resources

October 30, 1984

Idaho Water Resources Board
Statehouse
Boise, Idaho 83720

Dear Water Resources Board:

I understand that the Idaho Department of Fish and Game has applied for minimum stream flows for the Falls River, the Warm River, Bitch Creek, and the Teton River.

These minimum stream flows would not affect existing water rights held by irrigators, but they would preclude or limit proposed small hydro projects so that they would have acceptable impacts on the important fisheries of these streams.

Currently there is a surplus of electrical power in the Northwest. There is not a surplus of high quality fishing streams such as these.

If I understand the process correctly, you will forward Fish and Game's application to Mr. Dunn in the Idaho Department of Water Resources. He will hold a hearing or hearings, and make a decision for or against the application. If he decides in favor of the application, then it goes into effect unless the state legislature overturns it.

I read in the Fremont County Chronicle-News that county commissioner Jim Siddoway had made a number of his typical anti-wildlife comments about the Fish and Game proposal. He should know that the future of Fremont County is not sheep and logging, it's recreation. Furthermore, these streams are state and national resources. Opinion outside of Fremont country should count too. Please keep me informed about this issue, particularly about any hearings that may be scheduled.

Sincerely,

Ralph Maughan

Ralph Maughan
P. O. Box 1173
Pocatello, Idaho 83204

MICROFILMED
JAN 05 1989

INTER-DEPARTMENT MEMO — 1

DATE August 17, 1984

FROM Roberta Garrett

TO File 21-7283 ~~Appl~~

SUBJECT Minimum Streamflow Filing - Warm River

Reach: SWSE, Sec. 12, 09N, 43E
SESW, Sec. 12, 09N, 43E

NWNW, Sec. 13, 09N, 43E (Warm River in Sec. 13, 09N, 43E)

21-4024
21-7283 -
21-7277 } Upstream
21-4023 }

MICROFILMED
JAN 05 1989

SIGNATURE

On September 14, 1984 copies of the attached materials were sent to the property owners and waterusers identified on the attached mailing labels.

Linda Smith
LINDA SMITH

MICROFILMED
JAN 05 1989

MINIMUM STREAM FLOW
Fact Sheet

Water Right No.: 21-7281

Source: Fall River tributary to Henry's Fork

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: June 19, 1981

Rate of Flow: 140 cubic feet per second

Location of Reach: NE¼SE¼ Sec. 14 T8N R41E, Fremont County, upstream approximately 8 miles to State Highway 32 in SE¼ NW¼ Sec. 18 T8N R43E, Fremont County.

Purpose: To maintain the quality of the fishery and spawning and rearing habitat for the trout populations.

Public Meeting: Wednesday, September 26, 1984, at 7:30 p.m. in the courtroom of the Fremont County Courthouse, St. Anthony.

- -

Water Right No.: 21-7283

Source: Warm River tributary to Henry's Fork

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: June 19, 1981

Rate of Flow: 141 cubic feet per second

Location of Reach: NW¼NW¼ Sec. 12 T9N R43E, Fremont County, upstream about ½ mile to State Highway 47 in the SW¼SE¼ Sec. 18 T9N R43E, B.M., Fremont County.

Purpose: To maintain high quality fisheries and spawning and rearing habitat.

Public Meeting: Wednesday, September 26, 1984, at 7:30 p.m. in the courtroom of the Fremont County Courthouse, St. Anthony.

RECEIVED
JAN 05 1989

MINIMUM STREAM FLOW
Fact Sheet

Water Right No.: 22-7369

Source: Teton River tributary to Henry's Fork

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: June 19, 1981

Rate of Flow: 106 cubic feet per second

Location of Reach: NW¼NE¼ Sec. 20 T7N R44E, B.M. Teton County, upstream approximately 9 miles to State Highway 33 in SE¼SW¼ Sec. 23 T6N R44E, Teton County.

Purpose: To maintain trout habitat.

Public Meeting: Thursday, September 27, 1984, at 7:30 p.m. in the courtroom of the Teton County Courthouse, Driggs.

- -

Water Right No.: 22-7370

Source: Bitch Creek tributary to Teton River

Applicant: Idaho Water Resource Board

Requesting Agency: Idaho Department of Fish and Game

Date Application Filed: June 19, 1981

Rate of Flow: 28 cubic feet per second

Location of Reach: NW¼NE¼ Sec. 20 T7N R44E, B.M., Teton County, upstream approximately 6 miles to State Highway 32 in NW¼NW¼ Sec. 17 T7N R45E, Teton County.

Purpose: To maintain spawning and rearing of game fish.

Public Meeting: Thursday, September 27, 1984, at 7:30 p.m. in the courtroom of the Teton County Courthouse, Driggs.

MICROFILMED
JAN 05 1989

INTER-DEPARTMENT MEMO — 1

DATE August 17, 1984

FROM Roberta Garrett

TO File 21-7283

SUBJECT Minimum Streamflow Filing - Warm River

Reach: SWSE, Sec. 12, 09N, 43E
SESW, Sec. 12, 09N, 43E

NWNW, Sec. 13, 09N, 43E (Warm River in Sec. 13, 09N, 43E)

21-4024
21-7283

SIGNATURE

MICROFILMED
JAN 05 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

September 14, 1984

Re: Minimum Stream Flow Application on Warm River

Dear Property Owner:

The Idaho Water Resource Board will be holding a public meeting to solicit public input regarding a proposed minimum streamflow water right on a reach of Warm River. According to the records at the county courthouse, you are one of the owners of property adjacent to the reach where the minimum streamflow is proposed.

Information describing the application and the time and place of the meeting is shown on the enclosed fact sheet. Note that during the same meeting a proposed minimum streamflow on Fall River will also be reviewed. Also enclosed is a brochure which describes the minimum streamflow procedure.

At the meeting you will have an opportunity to learn more about the application and to express your views. On behalf of the Idaho Water Resource Board, you are cordially invited to attend.

Sincerely,

David R. Tuthill Jr.

DAVID R. TUTHILL, JR., P.E.
Supervisor, Water Allocation Section

DRT:ls

Enclosures

MICROFILMED
JAN 05 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

September 14, 1984

Re: Minimum Stream Flow Application on Warm River

Dear Property Owner:

The Idaho Water Resource Board will be holding a public meeting to solicit public input regarding a proposed minimum streamflow water right on a reach of Warm River. According to the records at the county courthouse, you are one of the owners of property adjacent to the reach where the minimum streamflow is proposed.

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At the meeting you will have an opportunity to learn more about the application and to express your views. On behalf of the Idaho Water Resource Board, you are cordially invited to attend.

Sincerely,

David R. Tuthill Jr.

DAVID R. TUTHILL, JR., P.E.
Supervisor, Water Allocation Section

DRT:ls

Enclosures

MICROFILMED
JAN 05 1989

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
Statehouse
Boise, Idaho 83720

RECEIVED
SEP 21 1984
Department of Water Resources

Samuel J. Howe
2 Sassafras Land
W. Helena, AZ

No such post office in state named

RETURNED TO SENDER
JAN 05 1989

WARM RIVER
Property Owner

Warm River Corp.
Box 593
Ashton, ID 83420

Alice Howe
Box 3242
Estes, Park, CO

Elizabeth H. Strange
7180 E. Berry
Englewood, CO

Samuel J. Howe
2 Sassafras Land
W. Helena, AZ

Claude A. Malan
1750 E. 29th
Ogden, UT 84403

Stimpson Enterprises
628 W. Craig
No. Las Vegas, NV

Teton Peaks Council
Idaho Falls, Idaho

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Boy Scouts of America
c/o T.P. Peterson
2566 Woodland
Ogden, UT

IDAHO DEPARTMENT OF FISH AND GAME
REGION 6

M E M O R A N D U M

September 11, 1984

TO: Virgil Moore

Dave Tuthill
Water Resources

FROM: Chip Corsi Chip Corsi

SUBJECT: RIPARIAN OWNERSHIP - TETON RIVER, BITCH CREEK, WARM RIVER, AND FALLS RIVER.

Here are the maps and lists of landowners you requested for the above mentioned streams.

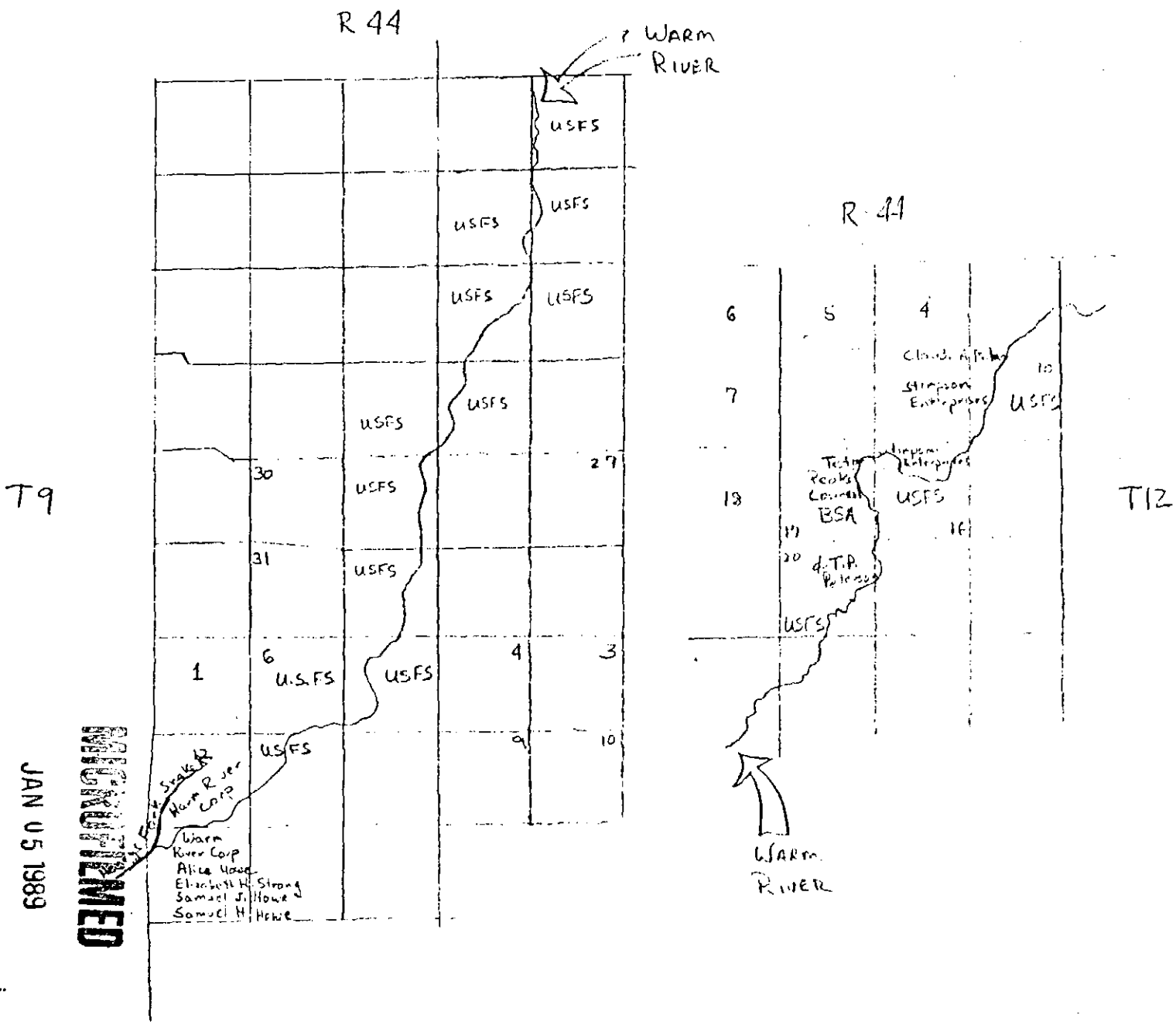
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JAN 05 1989

WARM RIVER

T	R	S	NAME	ADDRESS
9	44	12	Warm River Corporation	Box 593 Ashton, Idaho
9	44	13	Warm River Corporation Alice Howe Elizabeth H. Strang Samuel J. Howe Samuel H. Howe USFS	Box 593 Ashton, Idaho Box 3242 Estes Park, CO 7180 E Berry, Englewood, CO 2 Sassafras Lane, W Helena, A 2 Sassafras Land, W Helena, A
12	44	10	Claude A. Malan Stimpson Enterprises	1750 E 29th, Ogden UT 84403 628 W Craig, No. Las Vegas, N
12	44	16	Stimpson Enterprises	628 W Craig, No. Las Vegas, N
12	44	17	Teton Peaks Council, Boy Scouts of America	Idaho Falls, Idaho
12	44	20	c/o T.P. Peterson	2566 Woodland, Ogden, UT

NOTE: Remainder of Warm River flows through USFS, BLM, and State of Idaho lands.

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JAN 05 1989



RECEIVED
JAN 05 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

September 14, 1984

Re: Minimum Stream Flow Application on Warm River

Dear Wateruser:

The Idaho Water Resource Board will be holding a public meeting to solicit public input regarding a proposed minimum streamflow water right on a reach of Warm River. According to the records of this Department, you have a water right for which the point of diversions is located in or near the proposed minimum streamflow reach.

Information describing the application and the time and place of the meeting is shown on the enclosed fact sheet. Note that at the same meeting a proposed minimum streamflow on Fall River will also be reviewed. Also enclosed is a brochure which describes the minimum streamflow procedures.

At the meeting you will have an opportunity to learn more about the application and to express your views. On behalf of the Idaho Water Resource Board, you are cordially invited to attend.

Sincerely,

DAVID R. TUTHILL, JR., P.E.
Supervisor, Water Allocation Section

DRT:ls

Enclosures

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JAN 05 1989

WARM RIVER
WATERUSER

Harry J. Lewis
Box 593
Ashton, ID 83420

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JAN 05 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

Senators and Representatives
Letter

September 14, 1984

Re: Public Meetings Regarding Water Rights for Minimum Stream Flows

The Idaho Water Resource Board is planning to hold public meetings to solicit public input and reaction to four minimum streamflow applications for water rights proposed in or near your legislative district.

Applications on Fall River and Warm River will be reviewed at a meeting in the Fremont County Courthouse in St. Anthony at 7:30 p.m. on Wednesday, September 26. Applications on Teton River and Bitch Creek will be reviewed at a meeting in the Teton County Courthouse in Driggs at 7:30 p.m. on Thursday, September 27. Please find enclosed two fact sheets regarding the applications and a brochure which describes the minimum streamflow procedure.

On behalf of the Idaho Water Resource Board, you are cordially invited to attend.

Sincerely,

David R. Tuthill Jr.

DAVID R. TUTHILL, JR., P.E.
Supervisor, Water Allocation Section

DRT:ls

Enclosures

MICROFILMED
JAN 05 1989

Senators and Representatives

Sen. Vearl C. Crystal
Rt. 6, Box 232
Idaho Falls, ID 83401

Sen. Mark G. Ricks
Rt. 4, Box 173
Rexburg, ID 83440

Rep. Rich E. Orme
Box 32
St. Anthony, ID 83440

Sen. J. Marsden Williams
1950 Carmel Dr.
Idaho Falls, ID 83401

Rep. Kurt L. Johnson
Rt. 6, Box 407
Idaho Falls, ID 83401

Rep. Martin B. Trillhaase
Rt. 4, Box 226
Idaho Falls, ID 83401

Sen. Dane Watkins
2975 Fieldstream Lane
Idaho Falls, ID 83401

Rep. J. F. Chadband
460 E. Anderson
Idaho Falls, ID 83401

Rep. Gary L. Paxman
719 E. 16th St.
Idaho Falls, ID 83401

Rep. Linden B. Bateman
Rt. 1, Box 442
Idaho Falls, ID 83401

Rep. John O. Sessions
Box 10
Driggs, ID 83422

F. Melvin Hammond
149 Elm Ave.
Rexburg, ID 83440

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JAN 05 1989

State of Idaho
DEPARTMENT OF WATER RESOURCES
STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS
Governor

A. KENNETH DUNN
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 334-4440

September 14, 1984

Re: Public Meetings Regarding Water Rights for Minimum Stream Flow

Dear Interested Party:

The Idaho Water Resource Board is planning to hold public meetings to solicit public input and reaction to four minimum streamflow applications for water rights in which you may have in interest.

Applications on Fall River and Warm River will be reviewed at a meeting in the Fremont County Courthouse in St. Anthony at 7:30 p.m. on Wednesday, September 26, 1984. Applications on Teton River and Bitch Creek will be reviewed at a meeting in the Teton County Courthouse in Driggs at 7:30 p.m. on Thursday, September 27, 1984. Please find enclosed two fact sheets regarding the applications and a brochure which describes the minimum streamflow procedures.

On behalf of the Idaho Water Resource Board, you are cordially invited to attend.

Sincerely,

David R. Tuthill, Jr.

DAVID R. TUTHILL, JR., P.E.
Supervisor, Water Allocation Section

DRT:ls

Enclosures

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JAN 05 1989

Interested Parties

James Siddoway
County Courthouse
St. Anthony, ID 83445

Laurence Parker
County Courthouse
St. Anthony, ID 83445

Committee of 9
Robert Reichert
Rt. #2
Fyler, ID 83328

Dale Rochwood
Rt. #1, Box 218
Idaho Falls, ID 83401

Reed Murdock
Rt. #5 Box 53
Blackfoot, ID 83221

Reid Oldham
Rt. #2, Box 297
Rexburg, ID 83440

Paul Berggren
Rt. #1, Box 231
Blackfoot, ID 83221

Lester Saunders
Hazelton, ID 83335

Preston Alchley
Ashton, ID 83420

Claude Storer
Rt. #8 Box 327
Idaho Falls, ID 83401

Phil Hanks
Rt. #4 Box 455
Burley, ID 83318

Ronnie Ard
President - Teton Pipeline Assn.
Star Rt.
Newdale, ID 83436

Glen D. Nelson
Star Rt.
Newdale, ID 83436

Rex Ard
274 W. 1 S.
Rexburg, ID 83440

John C. Briggs
Box 96
Tetonia, ID 83452

Idaho Dept. of Lands
Statehouse
Boise, ID

Idaho Dept. of Parks and Recreation
Statehouse
Boise, ID

Mr. Clair Whitlock
State Director - BLM
3380 Americana Terrace
Boise, ID 83706

U.S. Forest Service
Ririe Hwy - Beeches Corner
Idaho Falls, ID 83401

Larry Cooke
County Courthouse
Driggs, ID 83422

Lowell B. Curtis
County Courthouse
Driggs, ID 83422

Reid Brower
County Courthouse
Driggs, ID 83422

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JAN 05 1989

DEPARTMENT OF WATER RESOURCES

State of Idaho, Statehouse, Boise, Idaho 83720
Phone: (208) 334-4440

FOR IMMEDIATE RELEASE

September 12, 1984

NEWS RELEASE

BOISE--- The Idaho Water Resource Board (IWRB) will conduct two public information meetings in eastern Idaho this month to discuss proposed minimum stream flow applications on file with the Idaho Department of Water Resources (IDWR.)

The Wednesday, Sept. 26 meeting at the Fremont County Courthouse, court room, St. Anthony, at 7:30 p.m. will deal with two proposed instream flow applications on Fall and Warm Rivers.

The Thursday, Sept. 27 meeting at the Teton County Courthouse, court room, Driggs, at 7:30 p.m. concerns Teton River and Bitch Creek instream flow applications.

All four applications were filed on June 19, 1981, at the request of the Idaho Department of Fish and Game. The applications, which seek year-round protection of fisheries and spawning and rearing habitat, provide for the following rates of flows and locations:

Fall River---140 cubic feet per second (cfs) from Highway 32 downstream about eight miles.

Warm River----141 cfs from Highway 47 downstream about 1/2 mile.

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more

Teton River---106 cfs from Highway 33 downstream about nine miles.

Bitch Creek---28 cfs from Highway 32 downstream about six miles.

As required by law, if the Idaho Water Resource Board finds the proposed minimum stream flows to be in the public interest, the Idaho Department of Water Resources will conduct public hearings on the applications later in the year. After the hearings, the applications will be reviewed by the Director of the Department, for approval or denial. If approved, the applications must be sent to the Idaho Legislature, which may approve or reject them.

The public is encouraged to come and let the Idaho Water Resource Board know how it feels about any or all of these proposed instream flow rights, which, if approved, would be junior to any other established rights on the streams. These minimum stream flow rights also would not in any way affect any earlier, existing rights.

-30-

JAN 05 1989

IDAHO DEPARTMENT OF FISH AND GAME
REGION 6

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JAN 05 1989

M E M O R A N D U M

September 11, 1984

TO: Virgil Moore

Dave Tuthill
Water Resources

FROM: Chip Corsi Chip/dlt

SUBJECT: RIPARIAN OWNERSHIP - TETON RIVER, BITCH CREEK, WARM RIVER, AND FALLS RIVER.

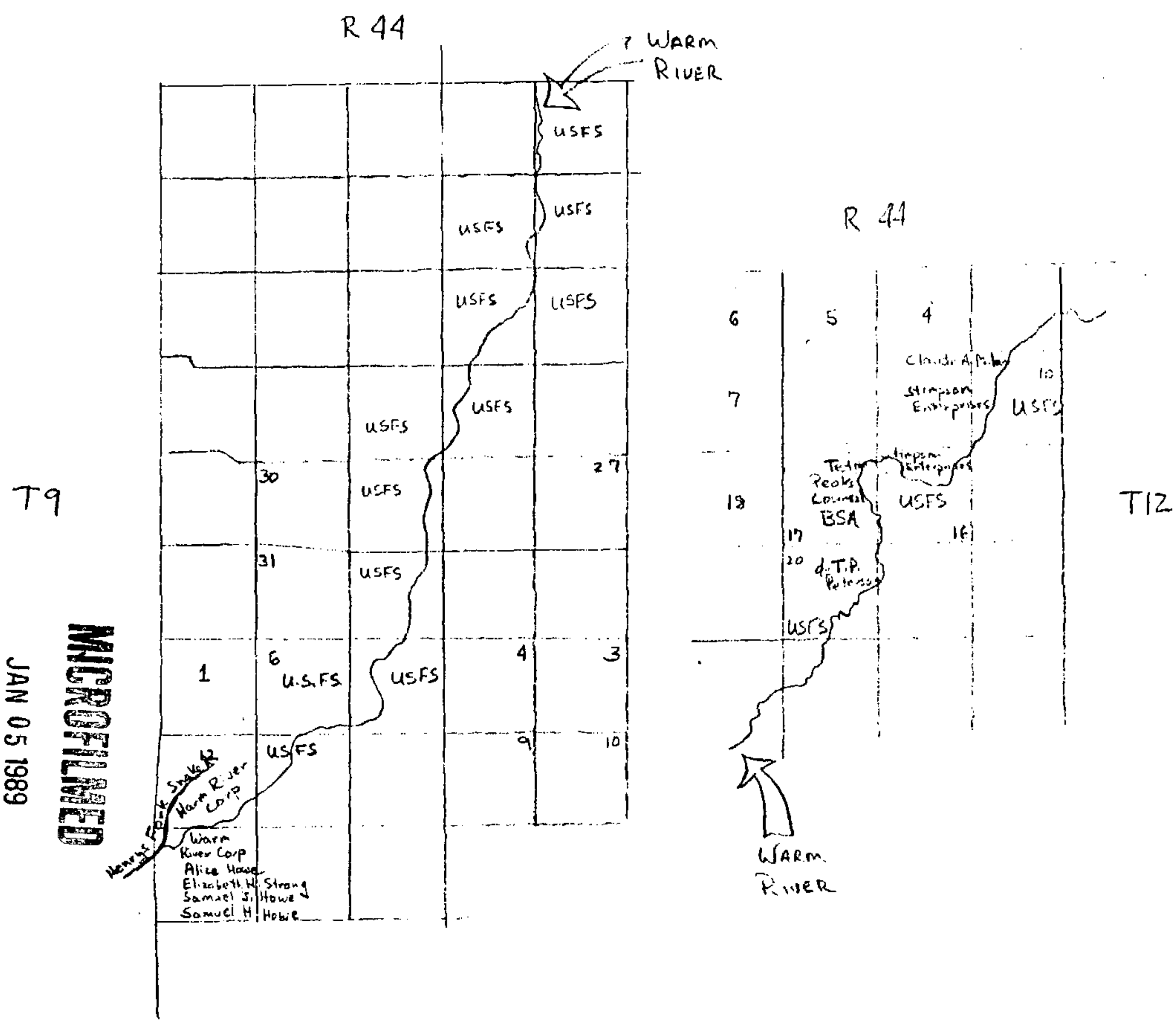
Here are the maps and lists of landowners you requested for the above mentioned streams.

WARM RIVER

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12	44	20	c/o T.P. Peterson	2566 Woodland, Ogden, UT

NOTE: Remainder of Warm River flows through USFS, BLM, and State of Idaho lands.

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