EQ 13-2 Water Budget EA/FONSI
PGC 2. July thru Dec. 1983

OCT 04 1983

PGC

Anthony R. Morrell, Environmental Manager - SJ

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

(Sgd.) JOHN B. PYRCH

Transmittal of Water Budget EA FONSI

Enclosed for transmittal to DOE for approval are: (1) the Water Budget EA FONSI; and (2) the errata sheet to the EA.

This copy of the FONSI is for your office to initiate a 568 for formal transmittal to DOE. It incorporates comments received from internal review.

Enclosures (2)

SPrice:sp (2406K)

cc:
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J. McLennan - PG
W. Hibbard - PGC
D. Harper - PJS
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U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Proposed Power System Changes
To Implement The Water Budget;
Finding Of No Significant Impact

AGENCY: Bonneville Power Administration (BPA), DOE.

ACTION: Finding of No Significant Impact (FONSI) on BPA's proposal to participate in implementation of the Water Budget measure of the Columbia River Basin Fish and Wildlife Program.

SUMMARY: The Columbia River Basin Fish and Wildlife Program was adopted in November 1982 by the Pacific Northwest Electric Power and Conservation Planning Council. The Water Budget measure of the Program is intended to meet the underlying need of improving the survival of juvenile salmon and steelhead migrating through reservoirs on the Columbia and Snake Rivers between April 15 and June 15 of each year. BPA has prepared, circulated for review, and considered an Environmental Assessment (DOE/EA-0214) on its proposal to join with the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) in the decision to implement the Water Budget as a firm power planning constraint on the coordinated Federal Columbia River Power System (EA, page 3). The Corps and the Bureau are in the process of preparing appropriate environmental documentation regarding their participation in implementing the Water Budget.

Reasons why power system changes are not significant:

(1) Implementation of the Water Budget creates a firm power planning constraint. The only clearly identifiable impact of the proposal results if additional generating resources would have to be acquired to replace generation previously obtained from flows which are now dedicated to fish.

However, the region's current energy surplus allows for derating the system without requiring the acquisition of additional resources. (EA, page 41). NEPA analysis on any future acquisition of additional resources will take place at the time the acquisition is proposed.

(2) Because BPA's action is a power planning function, BPA's treatment of the Water Budget as a firm power planning constraint results in no air, land, or water quality impacts at hydrogenerating projects within the region. Generating projects which are not on the mainstem Columbia River but are part of the Coordinated System will participate through coordinated system planning only to the degree that individual project constraints will allow (EA, page 30).

(3) The impact to power marketing is a reduction in firm energy availability of 510 MW, and increased and reshaped secondary energy production. BPA will compensate for any lost revenue by increasing rates (EA, page 43). The effects of rate increases attributable to the Water Budget are primarily socioeconomic in nature; there are no definitive physical effects (EA, pages vii, 44, and 49).

Notification of intent to prepare this EA was published in the Federal Register on February 17, 1983, and was mailed to Federal, State, and local agencies and to affected and/or interested members of the public on February 24, 1983. The EA, with a notice of preliminary FONSI (EA, page 49) was distributed for review on May 20, 1983. The comment period for the EA and preliminary FONSI ended on June 24, 1983. Copies of this finding will be distributed, along with responses to comments received, and errata to the EA, to those persons who received the EA. Copies are also available upon request from the Environmental Manager, Bonneville Power Administration, P.O. Box 3621 - SJ, Portland, Oregon 97208; telephone (503) 230-5136.

Based on the information outlined above, the Department of Energy finds that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, an environmental impact statement will not be prepared.

Issued in Washington, D.C.,

WILLIAM A. VAUGHAN
Assistant Secretary
Environmental Protection, Safety,
and Emergency Preparedness

ERRATA

Environmental Assessment

PROPOSED POWER SYSTEM CHANGES
TO IMPLEMENT THE WATER BUDGET

(Bonneville Power Administration, May, 1983)

1. Page V, Table S-1, number 1.a (right hand column) replace "Resource," with "Reduced."

2. Page vi, Table S-2, number 3.a (right hand column) after "total", insert "space available for". Delete "space".

3. Page vii, Table S-3, type of Environmental Impact #3, should be changed to read:

   "Relatively small physical changes, therefore no significant impacts."

4. Page 1, paragraph 2, line 7, delete all of line 7 and insert

   "will improve conditions for instream migrants. The" (in response to comment number 6).

5. Page 3, paragraph 5, line 4, insert the following after the word "alternative":

   ". . ., while it would at times provide optimum flows, . . ."(in response to comment number 7).

6. Page 14, paragraph 1, line 5, delete all in parentheses (in response to comment number 11).

7. Page 24, line 2, delete the word "generating" (in response to comment number 13).

8. Page 27, paragraph 2, delete last three sentences and replace with the following:

"Investigation of the 40-year record using seasonal hydroregulations with monthly averages of flows and generation indicated insignificant occurrences of peaking reductions for the Columbia and Snake River systems. Further analysis from an hourly standpoint showed that the continuous peaking ability of the Federal hydrosystem is very sensitive to the amount of energy generation and, hence, water releases from Federal reservoirs. This is particularly evident during normally low flow periods of the year such as August, September, and October. Reductions in firm load which cause the Federal system to approach minimum generation (as identified by minimum flow and electrical constraints) limit the ability to enter into peaking exchange arrangements. Too much return of energy during offpeak hours could cause Federal system load to fall below Federal system minimum generation requirements resulting in forced spill of water."

9. Page 28, section 4.5.2, paragraph 1, line 5; delete "any given year" and replace with ". . . the 40 years of record."

10. Page 31, section 4.6.4(b), delete the words "additional conservation" from lines 3 and 4. Acquisition of conservation has been detailed in a new subsection (d) of section 4.6.4 (in response to comments number 5 and number 80).

11. Page 31, section 4.6.4, add the following new section 4.6.4(d): (in response to comments number 5 and number 80).

"d. Acquisition of CONSERVATION and implementation of conservation programs to enhance efficient use of electricity. Conservation actions include but are not limited to the following:

1. Ensuring new residential and commercial facilities are energy efficient;
2. installing energy efficient appliances;
3. seeking more efficient means of manufacturing goods; and
4. making existing structure more energy efficient."

12. Page 31, section 4.6.5, line 9, delete "reductions to" and insert ". . . modifications to the timing of . . ."

13. Page 36, first paragraph, last sentence, insert "nonfirm" after "increased" (two places in the sentence).

14. Page 37, Table 2, last line, change (-69,204,000) to (+69,204,000).

15. Page 39, section 5.2.1, first paragraph, delete last sentence, insert "The decrease is approximately 9% of the total space available for storage during the September 1 to April 15 period." (in response to comment number 61).

16. Page 42, section 6.1.3, delete the first four lines and replace with the following:

> "Reductions in firm load during normally low flow periods may cause the Federal load to approach the generation required by the minimum flow. This condition can limit peaking exchange contracts in which energy is normally returned during offpeak hours. However, there are no physical changes anticipated to . . ."

17. Page 53, under Others/Individuals, add (in response to comment number 28) "Committee (PNUCC)" to "Pacific Northwest Utilities Conference."

18. Page D-1, add the following definition to the glossary: (in response to comment number 9)

> "CONSERVATION - Any reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution."

19. Page D-3, delete glossary definition of the Pacific Northwest Utilities Conference Committee (PNUCC) and replace with the following: (in response to comment number 29)

> "A voluntary association of public and investor-owned electric utilities and BPA's direct service industries. Its primary responsibility is long-range planning of resources to meet forecasted electricity demand."

PGC

NOV 18 1983

Interested Organizations and Individuals:

On May 20, 1983, Bonneville Power Administration (BPA) distributed its Environmental Assessment (EA) on the Proposed Power System Changes to Implement the Water Budget. Comments were accepted until June 24, 1983. BPA received 21 comment letters which contained 80 comments/questions.

Based upon the EA and the public review process, a Finding of No Significant Impact has been made with respect to BPA power system changes to implement the Regional Council's Water Budget. BPA's role in implementation of the Water Budget is not a major Federal action significantly affecting the quality of the human environment and, therefore, an environmental impact statement is not required. It must be recognized, however, that implementation of the Water Budget is not without cost. While the region currently has energy surpluses that allow BPA to alter its power marketing without significant environmental impact, the Water Budget does reduce the amount of that surplus by dedicating some water to fish flows. Simply put, this means that the region will reach load/resource balance sooner than if there were no Water Budget. When the region begins to approach this balance, new resource acquisition may be considered. When this occurs, BPA will assess the economic and environmental consequences of new resource acquisition.

Enclosed for your information are: (1) the Finding of No Significant Impact, and (2) an errata sheet to the Water Budget EA with the comment letters and responses to those comments. Any questions about the FONSI or our responses to comments should be directed to John B. Pyrch, Environmental Coordinator, Office of Power and Resources Management - PGC, P.O. Box 3621, Portland, Oregon 97208.

Sincerely,

(Sgd.) JOHN B. PYRCH

John B. Pyrch
Environmental Coordinator
Office of Power and Resources Management

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Department of Energy

Bonneville Power Administration
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In reply refer to: PGC

NOV 18 1983

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Sincerely,

John B. Pyrch
Environmental Coordinator
Office of Power and Resources Management

Enclosures (2)

U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Proposed Power System Changes
To Implement The Water Budget;
Finding Of No Significant Impact

Also filed in FONSI Book

AGENCY: Bonneville Power Administration (BPA), DOE.
ACTION: Finding of No Significant Impact (FONSI) on BPA's proposal to participate in implementation of the Water Budget measure of the Columbia River Basin Fish and Wildlife Program.
SUMMARY: The Columbia River Basin Fish and Wildlife Program was adopted in November 1982 by the Pacific Northwest Electric Power and Conservation Planning Council. The Water Budget measure of the Program is intended to meet the underlying need of improving the survival of juvenile salmon and steelhead migrating through reservoirs on the Columbia and Snake Rivers between April 15 and June 15 of each year. BPA has prepared, circulated for review, and considered an Environmental Assessment (DOE/EA-0214) on its proposal to join with the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) in the decision to implement the Water Budget as a firm power planning constraint on the coordinated Federal Columbia River Power System (EA, page 3). The Corps and the Bureau are in the process of preparing appropriate environmental documentation regarding their participation in implementing the Water Budget.

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FOR FURTHER INFORMATION CONTACT: Copies are also available upon request from the Environmental Manager, Bonneville Power Administration, P.O. Box 3621 - SJ, Portland, Oregon 97208; telephone (503) 230-5136.

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Issued in Washington, D.C., November 15, 1983.

/sgd/ William A. Vaughan

WILLIAM A. VAUGHAN
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11/83

WATER BUDGET FONSI

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DEPT OF NAT RES ENERGY DIV
32 S EWING
HELENA
MT
59601

00258
LARRY
KORN
STATE OF OREGON
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PO BOX 3503
PORTLAND
OR
97208

00268
CARLA
LEVINSKI
STATE OF IDAHO
DEPT HEALTH & WELFARE DIV OF ENV
450 W STATE ST
BOISE
ID
83720

00269
JIM
LICHATOWICH
STATE OF OREGON
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303 EXTENSION HALL OSU
CORVALLIS
OR
97331

00271
HERBERT
LUNDY
OREGON F&W COMMIS
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LAKE OSWEGO
OR
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00280
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83720

00296
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59901

00301
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OR
97828

00304
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DEPT OF FISH & GAME
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BOISE
ID
83707

00246
STEPHEN W
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STATE OF IDAHO
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1540 WARNER AVE
LEWISTON
ID
83501

00493
GLENN
PHILLIPS
POLLUTION CONTROL OFFICE
STATE OF MONTANA
DEPT OF FISH WILDLIFE & PARKS
HELENA
MT
59620

00308
HERB
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00317
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00016
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OR
97310

00322
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WA
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00323
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DEPT OF LANDS
STATEHOUSE
BOISE
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83720

00325
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STATE OF OREGON
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OR
97378

00347
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WA
98504

00363
CHUCK
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STATE OF OREGON
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CLACKAMAS
OR
97015

00368
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WOODIN
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DEPT OF FISHERIES
115 GENERAL ADMIN BLDG
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00177
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00108
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97201

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7500 SW GREENWOOD DR
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97223

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00231
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98368

00244
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WA
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OR
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00088
CC RED
PITTACK
TROUT UNLIMITED
1721 N AURORA
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WA
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00309
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3320 10TH ST
LEWISTON
ID
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00310
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00316
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6315 NE 196 ST
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WA
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00318
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MT
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00330
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SHUEY
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1010 4TH & PIKE BLDG
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WA
98101

00333
JEAN L
SIDDALL
OR RARE & ENDANG PLANT STUDY CTR
535 ATWATER RD
LAKE OSWEGO
OR
97034

00335
CURT
SMITCH
NW STEEELHEAD & SALMON COUNCIL
1617 E BAY DR
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98506

00337
MIKE
SPRANGER
WASHINGTON SEA GRANT
1919 NE 78TH ST
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WA
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00379
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ID
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98501

00390
LIBRARIAN
LINCOLN CO LIBRARY
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LIBBY
MT
59923

00391
MISSOULA CITY-CO LIBRARY
REFERENCE DEPT
101 ADAMS
MISSOULA
MT
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CONSERVATION
MOUNTAINEERS
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00394
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00460
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WA
98121

00481
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60201

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OR
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PGC

NOV 14 1983

Mr. Hugh Oriordan
Attorney
P.O. Box 1960
Boise, Idaho 83701

Dear Mr. Oriordan:

Enclosed is the Water Budget Environmental Assessment (EA) prepared by our office in May 1983 that you requested recently. You also requested a copy of any comments made on the EA and the Finding of No Significant Impact (FONSI). At this time, comments on the EA and the FONSI have not been distributed to the public. Your name will be placed on our mail list to receive the above.

Sincerely,

Shirley F. Price
Computer Assistant

Enclosure

SPrice:sp (2558K)

cc:
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

BPA

DATE : OCT 2 0 1983

In reply refer to : SJ

UNITED STATES GOVERNMENT

Memorandum

TO : Larry C. Larson
Assistant Administrator - AC

FROM : for Anthony R. Morrell Nicholas J Stas
Environmental Manager - SJ

SUBJECT: Transmittal of Finding of No Significant Impact (FONSI) on the Proposed Power System Changes to Implement the Water Budget

Attached is our memorandum to the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness (AS/EP) requesting that he approve the subject FONSI.

Attachments include:

1. Memorandum to AS/EP requesting approval of the FONSI.

2. Finding of No Significant Impact (the original and four copies for AS/EP and five extra copies for you).

3. Memorandum to Federal Register Management Team III requesting publication of the FONSI in the Federal Register. Please hold in your office pending AS/EP approval of the FONSI.

Thank you for your assistance. Please call Bill Freeland at FTS 429-4721 if you have any questions.

2 Attachments

LBurbach:jh (WP-SJ-24650)

cc:
W. Hibbard - PGC
J. Pyrch - PGC
Official File - SJ
x4721

OE F 1325.8
(7-79)

4-2-13 file · Water Budget

U.S. DEPARTMENT OF ENERGY

memorandum

DATE September 26, 1983

REPLY TO ATTN OF BPA-SJ

SUBJECT Advance Review of Proposed Power System Changes to Implement the Water Budget; Finding of No Significant Impact

TO

Michael Kleinrock, Compliance Policy Division, EP-361
Stanley Echols, Office of General Counsel, GC-34

Copies of the subject document are attached for your review. Following your review, we will submit the FONSI for official approval of the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness. We would appreciate receiving your comments as soon as possible. Please send your comments directly to Bill Freeland of my staff at FTS 429-4721.

(Orig. Sgd) Anthony R. Morrell

Anthony R. Morrell
Environmental Manager
Bonneville Power Administration

Attachment

BPA:WFreeland:amy:633-8330:09-26-83 (WP-SJ-24350)

cc:
BPA-AC (2)
J. Pyrch - PGC
W. Hibbard - PGC
Official File - SJ

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
BUILDING 602, CITY-COUNTY AIRPORT
WALLA WALLA, WASHINGTON 99362

REPLY TO
ATTENTION OF:

2 SEP 1983

NPWPL

Dear Interested Party:

Enclosed is a Final Environmental Assessment (FEA) prepared by the U.S. Army Corps of Engineers, Walla Walla District. The environmental analysis in this document focuses on the District's ability to provide water for the Northwest Power Planning Council's water budget concept as expressed in the Council's fish and wildlife program.

The Corps has made a Finding of No Significant Impact (FONSI) with respect to Alternatives A and B. The other alternatives require additional study before implementation. This finding is enclosed with the FEA.

We are sending this FEA to you for your information. The plates, tables, photo sheets, and map in the Draft Environmental Assessment (DEA) are to be incorporated into the FEA. Please transfer these pages to the FEA. Copies of the DEA or FEA will be sent to any interested party upon request. Additional copies are available for distribution by contacting the District Office at (509) 525-5500, extension 143.

Thank you for your cooperation.

Sincerely,

Gary A. McMichael
for L. V. Armacost, P.E.
Chief, Planning Division

Enclosures

ENVIRONMENTAL ASSESSMENT
Dworshak Dam and Reservoir
Water Budget Concept

I. INTRODUCTION

On 30 September 1982, the Northwest Electric Power Planning and Conservation Council (Council) requested the Corps of Engineers' assistance in analyzing the proposed water budget, which is part of the Council's Fish and Wildlife Program. The Fish and Wildlife Program establishes a total water budget of 78 KCFS-months [4.64 million acre-feet (MAF)] to be divided into 58 KCFS-months (3.45 MAF) at Priest Rapids Dam and 20 KCFS-months (1.19 MAF) at Lower Granite Dam. The intent of the water budget is to provide improved transportation flows for juvenile anadromous fish during their downstream journey to the Pacific Ocean. The water budget requirement has been simplified for study purposes and is assumed to be an average of 85,000 cfs at Lower Granite and 134,000 cfs at Priest Rapids for the month of May. These studies were undertaken to identify the impacts of alternative modes of operation for the water budget and their impacts on operation for other project purposes. In actual practice the water budget may be utilized during a 61-day period of 15 April through 15 June. Firm power flows have been specified in the Fish and Wildlife Programs to provide a base from which to measure water budget usage. Water budget usage is to be measured as the difference between the actual average weekly flows which result at Priest Rapids and Lower Granite and the firm power flows. The firm power flows are as shown below and the water budget concept is illustrated on Figure 1.

	Firm Power Flow in 1,000 cfs	
Date	Priest Rapids	Lower Granite
15 April through 30 April	76	50
1 May through 31 May	76	65
1 June through 15 June	76	60

The water budget is made available by retaining water in low runoff years that previously was released during the fall and winter months for firm energy load carrying capability (FELCC). The five storage projects that are utilized for this purpose are all located in the United States and consist of Libby (COE), Hungry Horse and Grand Coulee (both Bureau of Reclamation) located above Priest Rapids, Dworshak (COE), and possibly Brownlee (Idaho Power Company) located above Lower Granite. This reserved storage is then available for release during the spring juvenile anadromous fish migration period during those years when runoff conditions are adverse and flow augmentation is required. The impact on FELCC resulting from the water budget requirement is estimated to be approximately 500 average MW. This average FELCC impact and the generation resulting from the water budget implementation are shown on Figure 2.

Water budget implementation must not conflict with firm nonpower constraints. For example, the fish and wildlife program recognizes that physical storage of the water budget will be precluded some years due to the evacuation of reservoirs for flood control. All five of the storage reservoirs previously identified as water budget participants have flood control responsibilities. Flood control regulation requires that storage space be available at the beginning of the flood season (say 1 April) so that runoff can be stored during the spring snowmelt season to reduce peak discharges at downstream flood damage centers. The required amount of flood control space is variable and is dependent on the magnitude of the volume of runoff estimates for the specific year. The Dworshak and Libby reservoir flood control rule curves (Figures 3 and 4) are used to illustrate the constraint that flood control operation places on retention of reservoir storage prior to the beginning (15 April) of the water budget period. The 40 years of runoff data that are used for power studies (1928-68) illustrate the frequency of the magnitude of reservoir evacuation for flood control regulation. Figure 3 shows that the April-July volume of runoff at Dworshak will require complete evacuation of the reservoir by 1 April in 16 of the 40 study years. The Libby reservoir flood control rule curves (Figure 4) show that Libby is completely evacuated by April in 7 of the 40 study years. Results from these 40-year

studies at Dworshak show that the water budget requirement during years that have average or above runoff volumes will be provided by unregulated runoff and because of this, water budget requirements will not be dependent upon releases from reservoir storage.

During years of low runoff the water budget requirement will be provided from storage made available by the reduction of approximately 500 MW of FELCC. Studies indicate that approximately one-fourth of the years will fall into the critical low-flow category. Water budget releases from the five previously identified reservoirs will be made to meet the flow requests of the water budget managers for the Lower Granite and Priest Rapids control points. Control point flows exceeding the firm power flows resulting from the water budget managers' request will be considered to apply towards the water budget requirement.

During years of low to average runoff, the water budget will be made up of a combination of uncontrolled runoff and reservoir storage. As the volume of runoff increases, less of the water budget will come from reservoir storage reserved from the approximately 500-MW reduction in FELCC. It is anticipated that when runoff volumes are normal and above, the water budget requirements will come largely from unregulated runoff but the flexibilities of the reservoir system will be utilized to provide water budget flows as requested by the water budget managers.

To make flow studies within available time, it was necessary to assume perfect knowledge of runoff timing and volume, rather than simulating conditions that represent forecasted runoff. Obviously, in actual operation flow releases must be based on forecasted runoff. It was also necessary to use average monthly flows instead of daily flows. This assumption may cause underestimation of storage required for water budget implementation.

This Environmental Assessment evaluates the nonpower impacts at Dworshak Dam and Reservoir resulting from implementing the water budget. The Water Budget Concept was developed by the Northwest Power Planning

Council which was created by the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (PL 96-501). The Council developed the Columbia River Basin Fish and Wildlife Program which includes the water budget. We will determine whether the alternative modes of operation result in impacts which will require the implementation of the Dworshak Final Environmental Impact Statement for the 1984 water budget proposal. The program may be amended in 1985. The Corps of Engineers is required to work with the Council on the implementation of the Fish and Wildlife Program by Section 4(h)(11)(A) of the Act. Other proposals concerning the Fish and Wildlife Program will be studied separately.

II. PROJECT DESCRIPTION

Dworshak Dam and Reservoir is a Corps of Engineers' multipurpose water resource project at river mile 1.9 on the North Fork Clearwater River in Clearwater County, Idaho. The dam and lower portion of the reservoir are within the Nez Perce Indian Reservation and the entire project is in Clearwater County. Dworshak project was completed in 1976 and is an integral part of the comprehensive water resource development plan for the Columbia River and its tributaries. The authorized purposes of Dworshak are flood control, hydroelectric power production, navigation, and recreation.

Dworshak Dam is a concrete gravity structure rising 717 feet above the riverbed. The crest length is 3,287 feet at elevation 1613 mean sea level (msl). The hydraulic height of the dam (water depth of the lake at the dam) is 632 feet at full pool. The spillway extends down the front of the dam and consists of a concrete chute with two tainter gates. Maximum discharge capacity is 190,000 cfs at normal full pool elevation 1,600 feet msl. The dam is equipped with a turbine intake system that has selector gates for selective withdrawal of water from various levels of the lake to provide temperature control of released water. The powerhouse encloses the turbine-generator units, assembly area, and control and

maintenance facilities. Initial generator installation includes two 90-MW generating units and one 220-MW generating unit. Hydraulic capacity of these units is around 10,000 cfs.

Dworshak Dam creates a long narrow lake, extending 53.6 miles in the North Fork Clearwater River Canyon when the water is at elevation 1,600 feet msl. Prominent arms extend into Elk Creek, Canyon Creek, and the Little North Fork River Canyon. The water surface area is 16,417 acres at full pool and 9,050 acres at minimum pool elevation 1,445 feet msl. The shoreline length is 175 miles at full pool. When full, the reservoir contains 3,469,000 acre-feet of water. The difference between the full and minimum water level elevations is 155 feet providing 2,015,000 acre-feet of water storage.

III. NEED FOR THE PROPOSED ACTION.

The salmon and steelhead resources have both economic and cultural importance to the citizens of the Pacific Northwest. Certain populations of these fish have shown a marked decline during the twentieth century. The Council's Columbia River Basin Fish and Wildlife Program stresses the need to improve downstream migration and the survival of anadromous fish. The Water Budget Concept is one part of a total regional program to improve certain populations of these fish resources in the Columbia River and its tributaries.

IV. ALTERNATIVES.

A number of alternative modes of operation to meet the water budget were considered. However, a number are not reported here because the adverse impacts were so severe that they were discarded.

Alternative A (Base 2 Var Fish). This is the base regulation meeting firm and secondary powerloads. This proposal represents the "no action" alternative.

Alternative B (WMPCC#3). Dworshak would provide up to 0.6 MAF and Brownlee reservoir would provide the remaining flow to reach 85,000 cfs for a 31-day period at Lower Granite. (It must be recognized that the inclusion of flows from Brownlee project is for study purposes only. Idaho Power Company has made no commitment to participate in providing flows for water budget requirements.)

Alternative C (WMPCC#4). This alternative has the same flow objectives as Alternative B. Dworshak would provide up to 0.9 MAF of which at least 0.3 MAF would be spilled. Brownlee reservoir would provide the remaining flow to make up the 85,000 cfs for 31 days at Lower Granite.

Alternative D (WMPCC#2). This alternative has the same flow objectives as Alternative B. Dworshak was allowed to spill and Brownlee was utilized to meet the 85,000-cfs flow objective at Lower Granite Dam. Operating rule curves dictated the diversion of participation between Dworshak and Brownlee projects.

Alternative E (WM5HA-3). This alternative has the same flow objectives as Alternative B. Dworshak project would be utilized to meet the 85,000-cfs 31-day flow at Lower Granite. Brownlee project would be operated as shown in Alternative A Base Case. During some years, this alternative would not be able to meet the flow requirements.

Alternative F (81WGF). This alternative has flow of 85,000 cfs at Lower Granite in the last half of April and first part of May and then is reduced to 75,000 cfs. Water is supplied to meet required flow at Lower Granite from Dworshak and Brownlee in proportion to the amount of remaining water.

Alternative G (CRITFC5). This alternative was prepared by the Indian Nations and it deviates from the water budget requirement by requiring an additional 15 days of flow maintenance and having a slightly lower target flow. Following are target flows at Lower Granite:

46-Day Average Flow
15 April - 30 May

1929	83.6 kcfs
1930	73.5 kcfs
1931	No augmentation requirement
1932-1934	83.6 kcfs
1935	73.5 kcfs
1936-1968	83.6 kcfs

Dworshak will provide up to 15,000 cfs and it is assumed Brownlee would provide the remaining flows.

Alternative H (Galloway Dam). This alternative involves the construction of a dam on the Weiser River in Washington County, Idaho. The project could provide up to 900,000 acre-feet of the water necessary to meet the Water Budget Concept. This project is in the early stages of planning and could not be immediately available to meet the water budget. The development of Galloway Dam would reduce the need for the use of existing reservoirs for the water budget. However, because this involves future development which is not certain, this alternative will not be discussed further in this analysis.

V. ENVIRONMENTAL IMPACTS.

INTRODUCTION: Please consult Plates 1-61 which show comparison reservoir levels or Clearwater River flows at Spalding, Idaho, and Tables 1-26 which show comparisons of refill frequencies, reservoir levels, and regulated flows.

A. Physical Considerations.

1. Impacts on Water Quality.

a. Overall Impacts - Reservoir.

Dworshak Reservoir is a cold nutrient-poor body of water with low biological productivity and high aesthetic water quality. Dworshak's reservoir morphology (depth, low surface-to-volume ratio) and low watershed nutrient contribution are the primary factors influencing its water quality. During certain months implementation of the proposed alternatives will result in slight to moderate differences in pool elevations when compared to base conditions. The magnitude of pool level fluctuation will not differ appreciably from the base regime.

b. Overall Impacts - Downstream of Project.

Dworshak Reservoir has a multi-outlet release structure to allow selection of the temperature of water discharged through the turbines. An initial operating objective was to match Dworshak outflow temperatures with those of the main stem Clearwater River just above the North Fork confluence. With the thermal structure existing in the reservoir during stratification, however, and the physical limitation on the minimum depth from which water can be withdrawn, water warm enough to match summer temperatures in the Clearwater River is not available. The selector gates are presently used to provide the downstream steelhead hatchery with suitable water temperatures for fish production. Water temperature partially establishes the growth rate of the fish and helps to control disease. The present operation has moderated water temperatures in the lower Clearwater River, and the temperature regime has moved toward the mean, with warmer winter water temperatures and cooler summer water temperatures. Under the proposed alternatives, outflow requirements from the reservoir will differ from base conditions only during the winter and spring when both the Dworshak outflow and main stem Clearwater River temperatures will be relatively cold.

During periods of spill from the reservoir, gas supersaturation has occurred at levels that violate State of Idaho water quality standards. Under the current operational mode, periods of spill are infrequent and no adverse effects on the downstream ecosystem have been observed. Discharge requirements under Alternatives F, C, D, E, and G (in order of increasing severity) will exceed powerhouse capacity more often, resulting in an increase in the frequency and magnitude of spill. Alternative B outflows would exceed powerhouse capacity less frequently during the January through May period, and the frequency of spill would be reduced to 7 to 12 percent of that which occurs under base operations. The frequency changes are summarized below:

Percent of Time Outflow Exceeds Powerhouse Capacity (Spill)

	Feb	Mar	Apr	May
Alternative A	17	35	25	5
Alternative B	0	2	2	2
Alternative C	32	55	25	35
Alternative D	32	55	25	35
Alternative E	32	52	25	37.5
Alternative F	25	30	5	40
Alternative G	32	57	67	35

With the turbulent nature of the North Fork and main stem Clearwater Rivers, gas supersaturation is rapidly reduced to levels that do not adversely affect the aquatic ecosystem. It is likely that the impact associated with the increased frequency of spill will be limited to violations of Idaho's water quality standards. The wildlife of the river has adjusted to spillway use; therefore, no new adverse impact is expected.

2. Impacts on Air Quality.

Alternative A. The base releases water that is colder than the main stem of the Clearwater. This water has a cooling effect on the microclimate along the lower Clearwater River. During warmer weather, air temperature is somewhat lower than the main Clearwater River just above the confluence of the North Fork Clearwater River. The colder temperatures result in more frequent and more concentrated dew formations on vegetation along the riverbank.

Alternative B. This alternative would result in some minute shifts in the microclimate of the reach along the lower Clearwater River. Such shifts are a result of the temperature of the water selected from Dworshak Reservoir to meet the flow requirement at Lower Granite. As mentioned in Alternative A, Dworshak Reservoir water is usually colder than the water flowing in the main Clearwater River. The greater the percentage of the volume of water originating from Dworshak Reservoir passing through the reach, the greater the cooling effect. Therefore, it is expected that the cooling effect will extend farther along the riverbank.

All other alternatives would result in impacts similar to those expected in Alternative B.

B. Biological Considerations.

1. Impacts on Vegetation.

a. Aquatic Community. Aquatic macrophytes are virtually nonexistent in the North Fork Clearwater River system.

b. Terrestrial Community. Several areas of the reservoir contain vegetation which is dependent on seasonal pool elevations. Herbaceous wetland and red alder communities are the most common types affected. These communities are stressed when pool levels remain below

elevation 1590; this occurs approximately 15 percent of the years under present conditions (Alternative A). Consecutive years of stress on these communities would likely remove the less stress-tolerant species and encourage invasion of mesic upland species. Associated faunal changes would also occur as described below.

Little increase in impacts is expected under Alternative B. However, the increasing frequency of low-water years under Alternatives C (10%), D (10%), E (15%), F (10%), and G (18%) would be expected to result in changes in species composition within those communities with possible losses of these types in some areas.

2. Impacts on Animals.

a. Aquatic Community.

Alternative A. Fishes. Kokanee salmon, rainbow trout, and smallmouth bass are the principal game fish in the reservoir. Their food habits and spawning requirements typify the ecological niches occupied by the majority of reservoir fishes.

Kokanee salmon. Although it may consume aquatic insects, the kokanee is mainly a pelagic, plankton feeder, and would be impacted to the extent that an alternative reduced plankton production. Limnological investigations during the low-flow year of 1977 (maximum pool level of 1,548.8 feet msl) indicated that epilimnial planktonic production (phytoplankton and zooplankton) was only slightly reduced at the low pool level. Species shifts occurred, however, and during the summer, cyanobacteria (blue-green algae) which are not utilized in the food web to any great extent, dominated the phytoplankton community. The volume of the epilimnion, where the majority of plankton production occurs, will also be reduced at lower pool levels, and it is anticipated that kokanee populations will be impacted to some degree.

Kokanee spawning occurs primarily in the Breakfast Creek, North Fork Clearwater River, Elk Creek, and Little North Fork drainages. Access to spawning areas would not be impaired under any of the alternatives.

Under the present operational procedure, kokanee are frequently lost through the dam during periods of high discharge in the winter and early spring. Since the water budget alternatives propose storing water for release later in the spring, it is presumed that the demand for high outflows in the December to February period will be reduced and fewer kokanee losses may occur.

Rainbow trout. Terrestrial insects washed into the reservoir as the pool rises are the principal food items consumed by rainbow trout in the spring. As the frequency of achieving any particular reservoir elevation is decreased, total bank area inundated will be reduced, thereby decreasing the terrestrial insect biomass available to reservoir fishes. Since plankton production is minimal in the spring, a reduction of this allochthonous food source may constitute a moderate to severe (during low-flow years) stress on rainbow trout populations. Although higher than normal amounts of food (and cover) will be provided in succeeding years as the reservoir fills and inundates grasses and forbs which have colonized barren bank areas, it will have little mitigative effect on the population stressed during the low-water year.

Smallmouth bass. A decrease in the available terrestrial insect biomass will adversely affect the bass population not only by reducing the availability of food items in the spring, but also by impacting populations of insectivorous fishes (e.g., redside shiner) upon which they prey. Unlike rainbow trout, smallmouth bass do not shift to plankton as a food source as the summer progresses. They feed mainly on smaller fishes and aquatic and terrestrial insects throughout the year. Although flying insects may be deposited in the water at any reservoir elevation, it is likely that numbers of insects available to reservoir fishes are

influenced significantly by the proximity of the pool to shoreline vegetation. Since the banks below elevation 1,600 feet msl (normal maximum pool) are not vegetated, lower maximum pool levels and a decrease in the frequency of attaining full pool will result in a reduction in available food to the smallmouth bass population.

The most significant impact on smallmouth bass due to lower maximum pool levels may be a reduction in spawning success. Most of Dworshak Reservoir is steep-sided; there are relatively few shallow shoreline areas suitable for smallmouth bass spawning, e.g., Magnus Bay area. Maximum spawning opportunity exists at full pool. The impact of altered maximum pool levels may be slight at 5 feet below normal full pool to significant at 20 feet below.

Other fishes. Other fish species that have been documented from Dworshak Reservoir include chiselmouth, bridgelip sucker, largescale sucker, sculpin, northern pike, Pacific lamprey, brown bullhead, largemouth bass, mountain whitefish, northern squawfish, longnose dace, speckled dace, redside shiner, cutthroat trout, brook trout, and Dolly Varden. Certain of these fish (e.g., chiselmouth) were documented prior to a preimpoundment treatment with fish toxicant and it is unknown whether populations still exist in the reservoir. Others, such as northern pike, resulted from the illegal introduction of a few individuals. It is unlikely that the reservoir contains a viable population.

Little information exists on the life histories of most fishes in Dworshak Reservoir. Cutthroat trout, brook trout, Dolly Varden, and mountain whitefish, which likely spawn in the upper reaches of the reservoir, would be affected very little by variations in maximum pool levels. Species which spawn in shallow shoreline areas (largemouth bass and brown bullhead) could be expected to experience reduced spawning success as lowered pool levels reduce the available habitat. Redside shiners, which have a strong homing tendency, may be seriously impacted if access to preferred shoal spawning areas is limited by low pool levels.

Aquatic macroinvertebrates. With its steep sides and widely fluctuating water levels, Dworshak Reservoir does not provide optimum habitat for aquatic macroinvertebrates and the majority of reservoir macroinvertebrate production is limited to the benthic area below minimum pool. At higher pool levels, however, shallow areas near the mouths of tributary streams may support significant populations of displaced stream organisms. Many of these shallow areas will be eliminated as the maximum reservoir elevation decreases, limiting the importance of these tributary embayments as nursery and feeding areas for reservoir fishes.

Alternative B. Except for maintenance of higher pool levels during the winter, maximum elevations attained will not be significantly different from the base condition. No adverse impacts to the aquatic ecosystem are expected.

Alternative C. Lower maximum pool elevations will occur more frequently than base during the June to September period. Aquatic communities will be impacted to some extent, especially during low-flow years when aquatic animals may already be stressed.

Alternative D. Lower maximum pool elevations will occur more frequently than with the preceding alternative. Adverse impacts on the aquatic community will occur in lower than average flow years. Smallmouth bass spawning success and the existence of viable macroinvertebrate communities in shoreline areas may be adversely affected.

Alternative E. The frequency of achieving maximum reservoir elevation will be decreased significantly under this alternative, and aquatic communities will be impacted to a greater extent. Smallmouth bass spawning success may be marginal during low-flow years, resulting in the loss of a particular year class of fish. Shallow shoreline areas will be dewatered more frequently, preventing colonization by macroinvertebrates and making embayment areas less important to reservoir fishes.

Alternative F. The frequency of occurrence of lower maximum pool elevations will be similar to those encountered under Alternative D. Smallmouth bass spawning success and the existence of viable macroinvertebrate communities in shallow areas may be adversely affected.

Alternative G. This alternative, with the greatest frequency of lower maximum pool elevations, is expected to have the greatest impact on the reservoir ecosystem. Smallmouth bass spawning success will decline as suitable spawning areas are dewatered. Since shallow water embayment areas will exist less frequently, macroinvertebrate communities will not become established, reducing the food available to reservoir fishes.

General. The life cycles of the majority of aquatic animals in Dworshak Reservoir are, to some extent, influenced by pool levels achieved at various times of the year. Impacts may be directly related to the frequency and magnitude of pool level variations. Alternatives C, D, F, E, and G (in order of increasing severity) will result in a decrease in the frequency of achieving any particular maximum reservoir elevation. Pool elevations attained under Alternative B will also be lower than normal but with much less frequency than the other alternatives.

The water released from Dworshak is expected to increase migrating smolt survival through the downstream dams and reservoirs. If no other limiting factors of anadromous adults occur, the runs should increase in the Clearwater River as well as in other streams.

b. Terrestrial Community.

Alternative A. Large Mammals. Substantial white-tailed deer and Rocky Mountain elk populations inhabit Dworshak project lands. These animals are impacted under present conditions by the loss of habitat caused by the inundation of lowlands, the barrier to movement caused by the reservoir, the hazards of crossing ice shelves in the winter, and pressures of hunting activities induced by greater access to some areas

provided by the reservoir. Reservoir slopes below elevation 1600 provide some grazing forage to big game animals during those years when pool elevations do not reach maximum levels.

Other Alternatives. It is not anticipated that proposed Alternatives B through G will have significant negative effects on large mammal populations on Dworshak project lands. Because of the increased frequencies of years in which pool levels above 1590 are not reached during Alternatives C through G, large mammals may obtain benefits from increased availability of forage and having less water surface area to cross during movements between shorelines. Hunting pressures may decrease because of the increased frequency of years in which boating access from Grandad Creek ramp is unavailable (Table 5).

Alternative A. Waterfowl: The breeding population of waterfowl using Dworshak project lands is presently of minor proportions (less than 100 nesting pairs) comprised mainly of mallards, common merganser, and wigeon. At pool elevations 1590 to 1600, several brooding areas are available along the reservoir, mainly within protected bays and inlets. The carrying capacity for breeding waterfowl on Dworshak lands would be negatively affected by an increase in frequency of years when the maximum pool elevation remains below 1590 at which most brood areas would be unusable. Grass and forb growth on slopes below elevation 1600 may provide some brooding habitat for waterfowl. Use of the reservoir by wintering waterfowl is mainly for loafing because of the lack of shoreline and aquatic vegetation present during low pool levels during the winter. During the winter, upper reaches of the reservoir are often covered by ice and snow.

Other Alternatives. Alternatives B through G would increase the frequency of years in which reproductive success would be impacted because of the lack of available brooding and feeding areas. The degree of anticipated effect is related to the increase in frequency in years under each alternative in which pool levels remain below 1590.

However, because of the limited use of Dworshak by waterfowl, it is not anticipated that Alternatives B through G would significantly affect wintering populations of waterfowl.

Alternative A. Fur Animals: Several species of fur animals, including beaver, river otter, raccoon, and mink, are associated with reservoir shorelines. All of these species require shorelines with adequate vegetation for cover and food. Many parts of the reservoir lack adequate habitat during those years when maximum pool levels remain below 1595 (Table 2). Any increase in the frequency of those low-water years may further decrease fur animal populations along the 53 miles of Dworshak Reservoir. Fur bearers should not be significantly impacted.

Other Alternatives. Little change is expected under Alternative B. Alternatives C through G are thus expected to decrease the carrying capacity of Dworshak lands for fur animals. Fur bearers should not be significantly impacted.

Alternative A. Osprey. A significant osprey breeding population has become established along the reservoir during recent years. Nearly all active nests are over or very near the reservoir. Most nests are located near shallow bays or inlets. During those years when the reservoir remains below elevation 1590, the lack of nearby fishing areas may affect the reproductive success of the osprey. Ultimately, this could reduce the carrying capacity of the reservoir. An increasing frequency of low-water years within these shallow-water prey-productive areas may place an additional stress on this population.

Other Alternatives. Alternative B would only slightly increase the frequency of low-water years from the present (Table 3), and because of the potential for reduced fish mortality because of altered release rates during winter, there may be benefits to the osprey population if fish populations were increased. However, Alternatives C through

G would substantially increase the frequency of low-water years and thus osprey numbers would be expected to decrease. There would not be a significant impact resulting from the changes.

Alternative A. Bald Eagle: Bald eagles are classified as an endangered species in the State of Idaho and are thus afforded appropriate protection under the Endangered Species Act of 1973, as amended. A wintering population of around 30 bald eagles resides along Dworshak Reservoir, concentrating in feeding areas below the dam and in the Breakfast Creek arm of the Little North Fork area. Bald eagles below the dam feed on dead and dying fish which have passed over or through the dam during the winter; spawning kokanee constitute the major attraction to bald eagles in the Breakfast Creek area. A decrease in this wintering population of bald eagles may result from any declines in availability of fish resources in Dworshak Reservoir.

Other Alternatives. Because of the potential of reduced fish losses through the dam under Alternative B, those eagles feeding downstream may be negatively affected. Conversely, if Alternative B results in significant increases in the kokanee population, the eagles in the Breakfast Creek area may benefit. Alternatives C through G are expected to negatively affect kokanee (see discussion under fish resources), thus the carrying capacity for bald eagles may be decreased to some degree.

C. Cultural Considerations.

1. Impacts on Land Use.

The alternatives do affect wetlands along the lower Clearwater River. However, because the flows are within the natural stream channel, only minute adverse or beneficial impacts are expected.

2. Impacts on Recreation.

a. Downstream Fishing.

Fishing in the 1.9 miles of the North Fork Clearwater River below Dworshak Dam and in the main stem Clearwater River below Orofino consists primarily of steelhead fishing from October through April and rainbow trout fishing from May through September. Fishing success during both seasons is highly dependent on flows and fluctuations in flows in the Clearwater River which are directly related to outflows from Dworshak Dam.

Implementation of Alternatives B-G would result in lower flows and smaller fluctuations in flows in the Clearwater River than under Alternative A from November through March. These effects would improve steelhead fishing. Implementation of Alternatives B-G would also increase Clearwater River flows from 15 April to 15 June. This would reduce fishing success for rainbow trout.

b. Reservoir Boating.

Boating on the reservoir may begin as early as April but is heaviest between June and August. There are six launch ramps on the reservoir. The table below lists the lowest pool elevation at which the ramp is still usable for boat launching.

Grandad Creek	1560 MSL
Canyon Creek	1560
Freeman Creek	1540
Dent Acres	1520
Bruces Eddy	1480
Big Eddy	1440

Boating use is highly dependent on pool elevations with a significant reduction in use occurring when the pool drops below 1590 MSL. This is

explained by the fact that most boating use occurs in association with shoreline use which is sharply affected at this elevation. At elevation 1560 MSL the launching ramps at Grandad Creek and Canyon Creek are unusable, but by the time the pool has dropped this low, boating use has already been reduced by 50 percent. Since major reductions in boating use occur at pool elevations when all launch ramps are usable, extending any of the ramps would have little mitigating effect.

Our model, which we developed to estimate impacts of the various alternatives on recreation activities at Dworshak, is based on the following information.

Number of days of boating use per year under ideal pool conditions:	38,000	
Distribution of boating use:	June	15%
	July	30%
	August	25%
Estimated reductions in boating use at various pool elevations:	>1595	0%
	1594 - 1590	25%
	1589 - 1580	40%
	1579 - 1560	50%
	<1560	75%

Based on this information, we calculated that under Alternative A there would be an average of 35,100 days of boating use or a 7.7-percent reduction from the ideal condition. Under Alternative B, the average annual days of boating use would drop to 34,600 or 8.9 percent of ideal. The results of the model for all alternatives are summarized in the following table.

Alternative	Average Annual No. of Days of Boating Use	Percent Reduction from Ideal Condition
Ideal	38,000	0
A	35,100	7.7
B	34,600	8.9
C	33,300	12.3
D	33,300	12.3
E	32,000	15.8
F	32,600	14.1
G	31,600	16.8

c. Reservoir Fishing.

While some fishing occurs on the reservoir throughout most of the year, most occurs from June through August. An important component of this is shoreline fishing which is affected when the pool drops below 1590 MSL. At this elevation, which is 10 feet below full pool, there is a 15- to 50-foot strip of bare ground around the reservoir. This strip can be steep and muddy and can cause a reduction in shoreline fishing use.

Boat fishermen are also affected by pools below 1590 MSL. Many of them use mini-camps in conjunction with their fishing activities; therefore, when the pool drops below 1590 MSL causing a reduction in mini-camp use, boat fishing also declines.

At pool elevation 1560 MSL, the Grandad Creek ramp is no longer usable which practically eliminates all boat fishing in the upper half of the reservoir.

Our model to estimate impacts of the various alternatives on fishing is based on the following information.

Number of days of fishing use per year under ideal pool conditions:	80,000	
Distribution of fishing use:	June	20%
	July	30%
	August	20%
Estimated reductions in fishing use at various pool elevations:	>1595	0%
	1594 - 1590	10%
	1589 - 1580	25%
	1579 - 1560	50%
	<1560	75%

Based on this information, we calculated that under Alternative A there would be an average of 74,800 days of fishing use or a 6.5-percent reduction from the ideal condition. The results of the model for all alternatives are summarized in the following table.

Alternative	Average Annual No. of Days of Fishing Use	Percent Reduction from Ideal Condition
Ideal	80,000	0
A	74,800	6.5
B	73,500	8.1
C	70,900	11.4
D	70,900	11.4
E	67,600	15.5
F	69,900	12.6
G	67,300	15.9

d. Mini-Camps.

There are approximately 75 mini-campsites located around the reservoir. Most of them are accessible only by foot or by boat and consist of a tent pad, picnic table, fire ring, and toilet facility. Most of their use comes during June through August in conjunction with other activities such as fishing, boating, picnicking, and hunting.

Use of the mini-camps is highly dependent upon pool elevations, with a significant reduction in use occurring when the pool drops below 1590 MSL. The band of unvegetated shoreline can be very steep and muddy and makes use of the mini-camps unappealing and undesirable.

The model developed to estimate impacts of the various alternatives on mini-camps is based on the following information.

Number of days of mini-camp use per year under ideal pool conditions:	17,000	
Distribution of mini-camp use:	June	20%
	July	35%
	August	30%
Estimated reductions in mini-camp use at various pool elevations:	>1595	0%
	1594 - 1590	25%
	1589 - 1580	50%
	1579 - 1560	75%
	<1560	95%

Based on this information, there would be an average of 14,900 days of mini-camp use or a 12.3-percent reduction from the ideal condition under Alternative A. Under Alternative B, the average annual days of mini-camp use would drop to 14,600 or 14.2 percent of ideal. The results of the model for all alternatives are summarized in the following table.

Alternative	Average Annual No. of Days of Mini-Camp Use	Percent Reduction from Ideal Condition
Ideal	17,000	0
A	14,900	12.3
B	14,600	14.2
C	13,700	19.6
D	13,700	19.6
E	12,700	25.1
F	13,300	21.8
G	12,500	26.7

e. Camping.

Campgrounds on the Dworshak project are located at Freeman Creek, Dent Acres, and Canyon Creek. Overnight parking is permitted at Bruces Eddy on weekends only and at Grandad Creek as well. Most people who camp at Dworshak also participate in other activities. Therefore, when pool levels drop to levels where fishing and boating are affected, camping use will likewise be reduced. It is not, however, as sharply affected as mini-camp use because it is not as closely associated with shoreline use.

The following information was used in our model to estimate impacts of the various alternatives on camping use.

Number of days of camping use per year under ideal pool conditions:	17,500	
Distribution of camping use:	June	20%
	July	35%
	August	30%

Estimated reductions in camping use at various pool elevations:	>1595	0%
	1594 - 1590	10%
	1589 - 1580	25%
	1579 - 1560	50%
	1559 - 1540	75%
	<1540	90%

Based on the model, we calculated that under Alternative A there would be 16,000 days of camping use which is 8.4 percent below the ideal condition. The results of the model for all alternatives are summarized in the following table.

Alternative	Average Annual No. of Days of Camping Use	Percent Reduction from Ideal Condition
Ideal	17,500	0
A	16,000	8.4
B	15,700	10.4
C	14,900	14.6
D	14,800	15.4
E	13,900	20.6
F	14,500	17.1
G	13,900	20.7

f. Hunting.

Hunting on the Dworshak project occurs from September through November for white-tailed deer, Rocky Mountain elk, black bear, grouse, and quail. Some of the hunting use occurs in association with mini-camp use and many hunters travel by boat to their hunting areas. Consequently, pool levels which affect mini-camp use and boating will also affect hunting.

The following information was used in our model to estimate impacts of the various alternatives on hunting use.

Number of days of hunting use per year under ideal pool conditions:	4,500	
Distribution of hunting use:	September	20%
	October	60%
	November	20%
Estimated reductions in hunting use at various pool elevations:	>1590	0%
	1589 - 1580	10%
	1579 - 1560	25%
	<1560	50%

Based on the model, our calculations showed that hunting use under Alternatives A and B averages 3,500 days of hunting use annually which is 22.2 percent below the ideal condition. Under Alternative C, hunting use drops to 3,400 days of hunting use or 24.2 percent of ideal. The results for all alternatives are summarized in the following table.

Alternative	Average Annual No. of Days of Hunting Use	Percent Reduction from Ideal Condition
Ideal	4,500	0
A	3,500	22.2
B	3,500	21.8
C	3,400	24.2
D	3,400	24.2
E	3,100	30.9
F	3,200	28.7
G	3,300	27.0

g. Swimming.

Swimming at Dworshak occurs mainly in June, July, and August throughout the reservoir but mainly in areas which have developed sandy beaches like Dent Acres and Freeman Creek. When pool levels drop below 1595 MSL, these beach areas are exposed and swimming use declines drastically because swimmers do not like to wade through mud to swim.

The table below lists the frequency of pools below 1595 MSL for each alternative for the June-August period.

Alternative	Number of years out of 40 pool is below 1595 MSL	Percent
A	10	25
B	10	25
C	13	33
D	13	33
E	15	38
F	16	40
G	18	45

h. Water Skiing.

This activity is so closely related to boating use that impacts of the various alternatives on water skiing are very similar to those described in the discussion of reservoir boating.

i. Picnicking.

This activity was not analyzed in detail since it is probably least affected by lower pool levels. Besides, picnicking usually occurs in association with one of the recreation activities already discussed.

j. Total Recreation.

There are five main recreation activities at Dworshak which would be impacted by implementation of the Water Budget Concept. The following table summarizes these impacts by activity and calculates these impacts on total recreation use.

RECREATION TABLE 1/ 2/

Activity	Ideal	Alternatives A	B	C	D	E	F	G
Mini-Camp	17,000	14,900	14,600	13,700	13,700	12,700	13,300	12,500
		12.3%	14.2%	19.6%	19.6%	25.1%	21.8%	26.7%
Boating	38,000	35,100	34,600	33,300	33,300	32,000	32,600	31,600
		7.7%	8.9%	12.3%	12.3%	15.8%	14.1%	16.8%
Fishing	80,000	74,800	73,500	70,900	70,900	67,600	69,900	67,300
		6.5%	8.1%	11.4%	11.4%	15.5%	12.6%	15.9%
Camping	17,500	16,000	15,700	14,900	14,800	13,900	14,500	13,900
		8.4%	10.4%	14.6%	15.4%	20.6%	17.1%	20.7%
Hunting	4,500	3,500	3,500	3,400	3,400	3,100	3,200	3,300
		22.2%	21.8%	24.2%	24.2%	30.9%	28.7%	27.0%
TOTAL	157,000	144,300	141,900	136,200	136,100	129,300	133,500	128,600
		8.1%	9.6%	13.2%	13.3%	17.6%	15.0%	18.1%

1/ Numbers represent projected days of recreation use.

2/ Percentages represent the reduction from ideal conditions.

3. Impact on Aesthetics and Human Interest.

Alternative A. This alternative results in a modification of the aesthetics of the reservoir. As clearly shown on photo sheet 4, the drawdown in the reservoir results in a highly visible ring (earth-brown in color) along the shoreline. The reduction of the pool level by 5 feet to 1,595 feet msl does not result in a visual disturbance as the reservoir continues to have a natural lake appearance. Between 6 to 10 feet, sections of the reservoir begin to appear unnatural and after 10 feet of drawdown, the reservoir has lost much of its aesthetics. During our period of record, drawdown of the reservoir in June, July, and August below 10 feet occurs 8 times in 40 years.

Alternative B. This alternative would result in no increase in the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 8 times in 40 years.

Alternative C. This alternative would result in an increase of the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 12 times in 40 years.

Alternative D. This alternative would result in an increase of the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 12 times in 40 years.

Alternative E. This alternative would result in an increase of the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 14 times in 40 years.

Alternative F. This alternative would result in an increase of the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 12 times in 40 years.

Alternative G. This alternative would result in an increase of the occurrence of drawdown in the reservoir. It is projected that this operational mode would cause drawdown of the reservoir below 10 feet 15 times in 40 years.

4. Impacts on Cultural Status.

During low-water years, the alternatives would increase the velocity and volume of water moving down the lower Clearwater River. This would slightly increase the safety risk of recreators using the river. However, any increased risk is within the natural occurrence for the river and the river would stay within its banks.

The alternatives would reduce the number of years that the reservoir would reach full pool. This would have an effect on fire control at the project. There would be an increase in the time it would take fire crews to reach a fire. However, this is offset by a tendency of recreators to camp closer to the reservoir and not use minicamps during lower pool elevation. Experience indicates that most fire incidents at the project are the result of human activity.

In addition, debris removal would be affected by lower reservoir levels. The debris usually is deposited on the bank in the first 20 feet of drawdown. If a year passes where the pool does not fill, debris will accumulate requiring a greater effort to remove it. There is a continuing effort to control floating debris on the reservoir, and although this is not expected to be a problem, it could require extra caution by motorboat operators using the reservoir.

5. Manmade Facilities and Activities.

Navigation, and specifically log transportation, is one of Dworshak's authorized project purposes. There are currently five sites where facilities have been constructed for placing logs into the reservoir. Log dump sites at Breakfast Creek, Benton Creek, and Robinson Creek were constructed as part of the original project development by the Corps. Two other sites, one on the Little North Fork Clearwater River and the other at Little Meadow Creek were constructed in 1982 and 1983 by Potlatch, Inc. Log dump sites at Butte Creek and Milk Creek in the Clearwater National Forest are planned for construction in 1985 and 1986, respectively. While no transportation of logs has yet occurred on the reservoir, plans are underway to transport logs in 1983.

As currently planned, logs will be banded together in groups and transported to the dump sites by truck where they will be placed into the reservoir. Under this method of operation, the pool must be above 1580 MSL. If the logs are released from a height of greater than 20 feet (pools below 1580), the bands will break and the logs will separate. This would greatly increase handling costs.

In addition, five of the seven log dump sites are unusable at pool elevation 1580 MSL because of insufficient water depth. The Benton Creek site, for example, is usable only at pool elevations of 1595 MSL and above. Below 1585 MSL the Breakfast Creek and Robinson Creek sites do not have sufficient water depth for placing logs in the reservoir. The Butte Creek and Milk Creek sites will be operational at pool levels above 1590 and 1595 MSL, respectively.

Possible measures to mitigate the impact of pools less than full on log transport activities include extending all existing log dumps to 1580 MSL, establishing separate facilities at lower elevations, and modifying methods to permit releases from heights greater than 20 feet. Extension of the existing dump sites is not feasible because the terrain below these sites restricts their extension. The establishment of separate

facilities at lower elevations is extremely impractical because of a lack of suitable sites with potential road access adjacent to potential timber sales. Alternate release methods would increase handling costs which would reduce the cost effectiveness of log transportation on the reservoir.

Therefore, use of the Dworshak Reservoir for log transportation is extremely dependent on a reliable pool above 1580 MSL and is severely impacted when the pool is below this from June through October. Under Alternative A, pools below 1580 MSL occur 6 years out of 40 or 15 percent of the time. According to Table 4 this frequency would increase to 7 years out of 40 (18 percent) under Alternative B, 10 years out of 40 or 25 percent of the time under Alternatives C and D, 13 years out of 40 (33 percent) under Alternative E, 17 years out of 40 (43 percent) under Alternative F, and 12 years out of 40 (30 percent) under Alternative G.

Alternatives A and B would result in minor adverse impacts. Alternatives C-G, however, would result in frequencies that are significant to log transportation at Dworshak.

6. Water Budget Impacts on Power Production.

Although this assessment was prepared to discuss the nonpower impacts of implementing the water budget at Dworshak project, the following discussion on power impacts, as summarized from Bonneville Power Administration's environmental assessment "Proposed Power System Changes to Implement the Water Budget," is provided to permit a better picture of the impacts resulting from implementing the water budget.

In order to study the power impacts of the water budget, the energy content curves were raised to maintain a high probability of reservoir refill and still provide water budget flows. This resulted in system storage being higher beginning in the fall and continuing until the start of the water budget flow period. Therefore, accommodation of the water

budget requires reshaping of system storage through modification of energy content curves. This results in a loss of approximately 500 MW average of firm energy producing capability.

The primary loss of FELCC is from the transfer of water from firm energy production to providing flows for fish. Other factors that may enter into the loss of FELCC are head loss during second and later years of the critical period and greater potential for spill arising from changes to energy content curves and provision of water budget flows.

Providing water budget flows results in a reduction in the firm energy producing capabilities of the region's hydroelectric system. This increases the system's ability to generate nonfirm energy. Therefore, most markets will have increased accessibility to nonfirm energy. Potential operational impacts are: increased service from nonfirm energy to the direct service industries (DSI) top quartile load, displacement of thermal generating facilities, and increases of energy exports. However, this does not represent a real change under the current surplus situation since these loads would likely have been served from surplus firm energy which has been converted by the water budget to nonfirm energy.

The hydrosystem has been developed with peaking reserves to account for forced outages, unanticipated loads, and hydrosystem maintenance. Hydropeaking capability should not be significantly affected by providing water budget flows. Some third party transmission agreements may, however, be necessary under certain circumstances to insure adequate transmission of peak energy, depending upon the geographical location of the peak need at a given time.

Hydroregulation studies show that there is 1 additional year out of 40 where system refill does not achieve the desired 98-percent-of-full storage content. This means that the probability of providing advance energy or FELCC shift is reduced by a maximum 2.5 percent for any given year. The operational impact is a loss in system flexibility.

Following low runoff years, the system will begin the operating year with lower reservoirs. This can impact the amount of firm load which can be met during the operating year and will slightly increase the chance of drafting the system empty.

The implementation of mitigating measures could lessen water budget impacts on the system's flexibility in production of firm energy. One measure, shifting thermal plant maintenance to the April-June period, has already been done to a large extent. The use of Westside storage and generating capabilities to lessen operational impacts is dependent upon the degree to which existing Westside operation constraints will allow participation. The use of the British Columbia Hydrosystem is being explored but is constrained by terms and procedures of the Columbia River Treaty. Two future mitigation measures--resource acquisition and flood control adjustments--are for the most part beyond the scope of this document. Acquisition of future generating resources would come at a time when forecasts indicated a need for such acquisition and is dealt with as part of the Council's energy plan.

Marketing Impacts.

The identification of power system marketing impacts of implementing the water budget are a responsibility of Bonneville Power Administration. That agency's referenced environmental assessment addresses that issue and marketing impacts will not be discussed in this environmental assessment.

D. Ecological Considerations.

Food Web. Biological effects relative to the proposed alternatives are mainly a result of interactions of changing habitats on the primary and secondary food resource bases within the Dworshak Reservoir ecosystem. Although a few of these effects may have some beneficial impacts on some species, the majority of animal and vegetative species

dependent on pool levels will be negatively affected by the proposed alternatives. Further information is contained in discussions concerning flora and fauna.

VI. ENVIRONMENTAL REVIEW REQUIREMENTS.

A. Preservation of Historical Archeological Act; National Historic Preservation Act; and Executive Order 11593, Protection and Enhancement of the Cultural Environment.

It has been determined that the alternatives would have no effect on cultural resources.

B. Clean Air Act.

As required by Section 309 of the Act, this environmental assessment was provided for review to the Environmental Protection Agency.

C. Clean Water Act.

It has been determined that the alternatives would have no impact on the river from dredge or fill materials. There would be gas supersaturation resulting from spill at the dam. This is a short duration event.

D. Coastal Zone Management Act.

The proposed action is not within the coastal zone and therefore would not be affected by the requirements of the Act.

E. Endangered Species Act.

Coordination and Section 7(c) consultations with the Fish and Wildlife Service were accomplished. The American bald eagle, an endangered species, winters around Dworshak but would not be impacted by the alternatives.

F. Estuary Protection Act.

The alternatives would not adversely affect the Columbia estuary.

G. Federal Water Project Recreation Act.

The Act is not applicable to the proposed alternatives.

H. Fish and Wildlife Coordination Act.

The proposed action has been coordinated with the appropriate agencies.

I. Land and Water Conservation Fund Act.

The Act is not applicable to the proposed alternatives.

J. Marine Protection Research and Sanctuaries Act of 1972, As Amended.

The Act is not applicable to the proposed alternatives.

K. National Environmental Policy Act.

This environmental assessment has been prepared and circulated for review and comment as required by the Act and its implementing regulations.

L. Wild and Scenic River Act.

The alternatives would not impact rivers protected under the Act or included in the inventory.

M. Pacific Northwest Electric Power Planning and Conservation Council Act.

The alternatives are directly in response to the Fish and Wildlife Program which was authorized through this Act.

N. Executive Order 11988, Flood Plain Management.

The alternatives do not conflict with the goals of the Executive Order.

O. Executive Order 11990, Protection of Wetlands.

The alternatives do not conflict with the goals of the Executive Order.

P. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions.

The Executive Order is not applicable to the proposed alternatives.

Q. CEQ Memorandum, 11 August 1980, Analysis of Impact on Prime or Unique Agricultural Lands in Implementing NEPA.

The alternatives are in compliance with the meaning of the Memorandum.

Nez Perce

TRIBAL EXECUTIVE COMMITTEE

Box 305
LAPWAI, IDAHO
83540

(208) 843-2253

CERTIFIED

January 26, 1983

District Engineer, Walla Walla District
U.S. Army Corps of Engineers
ATTN: NPWPL-ER
Bldg. 602, City-County Airport
Walla Walla, WA 99362

RE: December 6, 1982 comments by James Lawyer on the Dworshak Reservoir - Water Budget draft EA

Dear Sir:

1) It has come to the attention of the Nez Perce Tribe of Idaho that comments made by Mr. James Lawyer, Nez Perce Tribal Data Planner in our Economic and Community Development Office, on the Dworshak Reservoir-Water Budget draft EA did not reflect the position of the Nez Perce Tribal Executive Committee (NPTEC). Mr. Lawyer's comments did, in fact, represent his own concerns as to potential adverse economic impacts on the Nez Perce Tribal Marina. However, he was unaware of the need for the Water Budget and the necessity of utilizing water from Dworshak to enhance the survival of downstream migrating smolts. At this time, the NPTEC would like to go on record as endorsing the Water Budget and we fully realize that, at times, a substantial draw-down of Dworshak Reservoir will be necessary in order to augment flows in the Snake and Columbia Rivers. The enhancement and restoration of anadromous salmonid stocks in the headwaters of the Columbia-Snake River system has been, and will continue to be, a high priority of the Nez Perce Tribe of Idaho.

The Nez Perce Tribe regrets any consternation which may have been caused by Mr. Lawyer's letter. If there is need for any further input from our Tribe concerning this matter, please contact James H. Johnson, Tribal Fisheries Program Director at 208/843-2253, extension 342.

Sincerely,

NEZ PERCE TRIBE OF IDAHO

Richard A. Hallinson

for - Wilfred A. Scott
Chairman

cc: Northwest Power Planning Council
700 S.W. Taylor
Portland, OR 97205

INTRANATIONAL

1. Response.

These comments are noted. Mr. Lawyer's letter has been included in the individual letters of comment section.

FEDERAL

2. Response.

The letters' general comments are noted. The Columbia River dams are not able to provide flows into the Snake River. Galloway Dam could provide a portion, but it has not been constructed or authorized and could not provide immediate storage for the water budget program.

Department of Agriculture
Conservation Service
304 North 8th Street
Boise, Idaho 83702

December 15, 1982

U.S. Army Engineer District, Walla Walla
ATTN: NPWPL-ER
Bldg. 602, City-County Airport
Walla Walla, WA 99362

TO WHOM IT MAY CONCERN:

As the Environmental Assessment on the Dworshak Dam and Reservoir Water Budget Concept states, the intent of the water budget is that a quantity of water be stored in headwater reservoirs to provide flows equivalent to an average of at least 85 kcfs at Lower Granite for 31 days consistent with other nonpower project purposes during the critical low flow years to assist populations of juvenile anadromous fish with downstream migrations.

We feel that considering only Dworshak Reservoir as a source of water for the entire downstream migration of steelhead is a mistake.

(2) There are numerous dams on the upstream end of the Columbia River Basin and each should supply a portion of the need or, or as Alternative H (Galloway Dam) suggests, build this dam to supply the total need for the fish.

I am sure all the other dams are fully appropriated and there really isn't that much water available to use.

Sincerely,

Amos I. Garrison, Jr.
State Conservationist

The Soil Conservation Service is an agency of the Department of Agriculture

SCS-AS-1
10-79

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

DEC 15 1982

Colonel Robert B. Williams
District Engineer
U. S. Army Engineer District, Walla Walla
ATTN: NPWPL-ER
Building 602, City-County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

We appreciate the opportunity to review the Environmental Assessment (EA) for Dworshak Dam and Reservoir Water Budget Concept. The EA appears to adequately evaluate the impacts of the proposed alternatives at Dworshak. However, to fully evaluate the impacts of the water budget concept alternatives, it would
3) be helpful if Dworshak and Brownlee Dams were analyzed together in a joint effort among the Corps of Engineers, the Federal Energy Regulatory Commission and the Idaho Power Company. If both dams are to be used to meet the flow requirement at Lower Granite Dam, or if other dams might also be used, the EA should discuss the cumulative impacts of the various alternatives.

Sincerely,

Richard R. Thiel, P.E., Chief
Environmental Evaluation Branch

3. Response.

There has been no assurance that Brownlee project will participate in the water budget proposal. This environmental assessment evaluates only the proposal's nonpower impacts at Dworshak for significance. This is the only area of review that is being investigated at this time.

4. Response.

We have included a discussion of the power impacts which are analyzed in the Bonneville Power Administration's (BPA) environmental assessment, "Proposed Power System Changes to Implement the Water Budget."

5. Response.

See the above response. In addition, water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget report. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows.

6. Response.

The power aspects are discussed in BPA's environmental assessment referenced above.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

OEPR-DEA

DEC 15 1982

Colonel Robert B. Williams
District Engineer
U.S. Army Engineer District, Walla Walla
ATTN: NPWPL - ER
Bldg. 602, City - County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

This is in reply to your letter dated November 19, 1982, requesting comments of the Federal Energy Regulatory Commission (FERC) on the draft environmental assessment (EA) of the non-power impacts associated with the operation of the U.S. Army Corps of Engineers (Corps) Dworshak Project as part of the water budget program proposed by the Northwest Electric Power Planning and Conservation Council (Council).

The Commission staff has reviewed the EA and has the following general comments.

The EA focuses only on the nonpower impacts of the water budget program on the Dworshak Project; however, power impacts of the proposed Dworshak Project operation may be substantially
(4) greater than those discussed. Additionally, the impacts related to Dworshak represent only a portion of the total impacts related to the water budget concept, as proposed by the Council.

Because of the significant regional effects on the proposed water budget concept, which involve several major hydroelectric projects and other facilities, an environmental impact state-
(5) ment (EIS) should be prepared. The EIS should include an assessment of the total impacts of the water budget on all projects, both power and non-power. A project-by-project approach does not allow an adequate understanding by the reviewer.

Specific comments on the EA are as follows:

(1) Although the EA states that 550 megawatts of firm power would be lost and other adverse impacts would be realized, it
(6) does not evaluate the projected benefits. It would appear that quantification of benefits must be provided before such power capacity is precluded from operation.

(2) The EA should consider or discuss the region-wide environmental and socioeconomic impacts of replacing from
(7) other sources the 550 megawatts of firm power capacity which would be lost by implementing the proposed water budget.

(3) The EA should consider or discuss the possible impacts on the existing Snake River flow regime that is provided for
(8) by a settlement agreement between Idaho Power Company and the fishery agencies (FERC Docket No. E-9579), if Brownlee Reservoir (FERC Project No. 1971) were to participate in the water budget program in coordination with the Dworshak Project.

Thank you for the opportunity to comment on the draft EA for the Dworshak Project.

Sincerely,

Lawrence R. Anderson

Lawrence R. Anderson
Director, Office of Electric
Power Regulation

7. Response.

As stated in response 6, the BPA environmental assessment discusses the power aspects of the proposal. At the present time, we are in a surplus power condition which is expected to last several years. At the time we would expect there to be a need for new power resources, the NEPA process would be considered in selecting the new resource as well as the evaluation of the impacts.

8. Response.

At this time, the Brownlee project is not committed to the water budget proposal. This environmental assessment evaluates only the operational impacts at Dworshak if Brownlee was involved. The scope of this assessment is limited to Dworshak project.

In addition, water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget report. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows.

9. Response.

The Corps of Engineers regulations do not allow an "interim FONSI" procedure. The interpretation of the National Environmental Policy Act is to complete the procedural process before implementation. There will either be a FONSI or the FEIS will be supplemented.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
847 NE 19th AVENUE, SUITE 350
PORTLAND, OREGON 97232
(503) 230-5400

December 17, 1982 F/NWR5:BJB

Colonel Robert B. Williams
U.S. Army Engineer District, Walla Walla
Bldg. 602, City-County Airport
Walla Walla, WA 99362

ATTN: NPWPL-ER

Dear Colonel Williams:

The National Marine Fisheries Service (NMFS) has reviewed the draft environmental assessment (EA) on the nonpower impacts on Dworshak Project as that project is used to provide water for the Water Budget Concept. In accordance with your request dated November 19, 1982, our comments follow:

General Comments

The intent of the Pacific Northwest Electric Power and Conservation Planning Council's (hereinafter the Council) Water Budget is to partially reduce an existing, highly significant impact of the Columbia Basin Hydroelectric System on anadromous salmonids. Our primary concern is the immediate need for flows to protect salmon and steelhead stocks in the Columbia River Basin. In the fish and wildlife agencies' and tribes' recommendations to the Council, upon which the Water Budget is based, we documented survival rates for migrating juvenile salmon and steelhead, to the lower river, of less than 5 percent in low water years.

The urgency of remedial measures to offset the impact of the Columbia River Hydroelectric System is evidenced in the Northwest Electric Power Planning and Conservation Act by the mandate to develop and adopt the fish and wildlife program, prior to the development or review of the regional power plan. Congress further recognized the need for this specific measure by including the provision that the program contain measures which will, "in the case of anadromous fish - provide flows of sufficient quality and quantity between (hydroelectric) facilities to improve production, migration and survival..."

In the event that the response to this draft EA by parties knowledgeable of and/or responsible for the affected environment in and around Dworshak Reservoir does not permit a finding of no significant impact (FONSI), we
(9) propose that an interim FONSI be made for a period of two years, while a full environmental impact statement is prepared. We believe that we are justified in this proposal due to, (1) the significance of the beneficial impact on anadromous fish survival (or conversely, the detrimental impact of the no-action alternative), (2) the remedial nature of the action, and (3) the lack of any identified irretrievable damage that would occur with implementation over for a two-year period.

The latter is especially applicable since most impacts are associated with a reduction in refill probabilities and in most cases have considerably less than a 50 percent probability of occurence.

Specific Comments:

III. Need for the Proposed Action

This section should be amended to more accurately reflect the current status of Snake River anadromous fish runs and the purpose of the improved flows. Additionally, this section should include recognition that the Corps under the (10) provisions of Section 4(h)(11)(A) has an obligation to implement the Water Budget to the "fullest extent practicable" and must provide "equitable treatment" of fish and wildlife with other project purposes at Dworshak.

To incorporate these comments, we recommend the following:

> "Salmon and steelhead resources in the Columbia and Snake Rivers have historical, social and biological importance to the citizens of the Pacific Northwest. In addition, these resources contribute to valuable commercial, recreational and Indian treaty fisheries, for an estimated annual contribution of approximately $141 million per year.
>
> Unfortunately, salmon and steelhead resources have suffered with the development of the Pacific Northwest. Development on and along the Columbia and Snake Rivers, including federal and non-federal water and power projects, have taken a serious toll in lost fish habitat and in continuing fish mortalities. Some runs have been eliminated, while others such as upriver spring and summer chinook salmon are in a critically depressed state. As a result of these declines, regional, national and international ocean fisheries are suffering serious financial setbacks; inriver fisheries have been closed; and harvest management has become an increasingly complicated and difficult process.
>
> The problem of declining salmon and steelhead runs is most severe in the Snake River, where flows for migration of juvenile fish are so low that many observers question whether the runs will continue without improved flows. In fact, salmon and steelhead runs in the Snake River have been considered for listing under the Endangered Species Act.
>
> The Fish and Wildlife Program adopted under the Northwest Power Act is intended to reverse the declining trend of salmon and steelhead runs and to restore populations to levels which can sustain harvest. It is the obligation of the Corps, under the provisions of that Act to take the Council's program into account to the fullest extent practicable and to provide equitable treatment of fish and wildlife with other project purposes at Dworshak. A major component of the program is the Water Budget. Without the improved flows which will be provided by the Water Budget, the restoration of Snake River salmon and steelhead runs could be an impossibility, and it is likely that the runs would continue their sharp decline."

10. Response.

This comment has been noted.

11. Response.

We have included in the general discussion section of the aquatic community portion of the environmental assessment a statement concerning increased smolt survival.

12. Response.

We have made this correction.

V. Environmental Impacts

B. Biological Considerations

2. Impacts on Animals

a. Aquatic community

This section should be expanded to include the impact of the various alternative modes of reservoir operations on anadromous fisheries. In particular, comparisons should be made on the detrimental impact of the no-action alternative on juvenile salmon and steelhead migrant survival and the improvements in survival associated with alternatives that achieve the
(11) flow objective. For example, based on hydroregulation studies conducted by the Interagency Instream Flow Work Group for the base case (85 G) and operation to meet recommended fish flows using Grand Coulee, Dworshak and Brownlee (85 K), we have estimated an improvement in survival per project from 71 percent to 77 percent with the implementation of fish flows.[1/] Considering the cumulative impact of passing eight dams, this would result in an overall increase in survival to the lower river of 90 percent.

Draft FONSI

(12) Page 2, paragraph 2, line 8: "kokanee" should read "smallmouth bass."

Sincerely,

Dale R. Evans

Dale R. Evans
Division Chief

1/ Ceballos, J.R. "Impact of Incremental levels of riverflow on Snake and Columbia River Juvenile Fish Survival. NMFS working paper. May, 1982. p.8.

cc: CBFWC
Curt Marshall (PPC)

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: SJ

December 17, 1982

Colonel Robert B. Williams
District Engineer
U.S. Army Engineer District, Walla Walla
Attn: NPWPL-ER
Bldg. 602, City-County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

Thank you for the opportunity to review and comment on your environmental assessment (EA) of the impacts on the Dworshak Project from releasing water budget flows. Bonneville Power Administration (BPA) recognizes that the (13) document is project specific and does not address systemwide non-power impacts from the Power Planning Council's Water Budget. Therefore, we have no substantive comments to add related to the singular project-specific nature of the document.

We are concerned that the Dworshak environmental assessment did not accurately (14) reflect the Council's final Water Budget and the degree of participation of Idaho Power Company's Brownlee Reservoir.

In response to our own National Environmental Policy Act responsibilities, BPA (15) has initiated an internal review of systemwide changes to the power supply system in order to determine any environmental consequences of program implementation. We will keep you informed of the progress of this review.

Sincerely,

Anthony R. Morrell

Anthony R. Morrell
Environmental Manager

13. Response.

This comment is noted.

14. Response.

The environmental assessment does reflect the water budget impacts on Dworshak's operation. Brownlee reservoir may not participate in the program.

15. Response.

This comment is noted.

16. Response.

Although smallmouth bass are not native to the Clearwater River, they do now exist within the project. Any operational change at Dworshak would attempt to minimize the impacts on the smallmouth bass while meeting the water budget proposal. However, some impact would be unavoidable as priorities of operation are established.

17. Response.

This comment has been noted.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
4620 Overland Road, Room 209
Boise, Idaho 83705

December 20, 1982

Colonel Robert B. Williams
District Engineer
Department of the Army
Walla Walla District, Corps of Engineers
Building 602, City-County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

We have reviewed the draft environmental assessment (EA) and draft finding of no significant impact concerning the proposed operation of Dworshak Dam and Reservoir to facilitate the Pacific Northwest Power Planning Council's water budget as called for in the Council's final Fish and Wildlife Program. Our comments have been coordinated with the Idaho Department of Fish and Game, with our Fisheries Assistance Office in Vancouver, Washington, the Dworshak National Fish Hatchery, and with the National Marine Fisheries Service in Portland.

General Comments

The overall benefits to outmigrating salmon and steelhead from implementation of spills from Dworshak Dam and Reservoir are not discussed in the EA. Since (16) impacts to reservoir fishes from implementation of augmentation flows would be greatest for smallmouth bass, an exotic species, we suspect that benefits to outmigrating salmon and steelhead smolts, endemic species, would be easily justified from a purely biological stance.

The Fish and Wildlife Service (FWS) would consider the no action alternative A as unacceptable because of the urgent need for action to augment passage flows (17) during smolt outmigration. Wherever possible, existing storage in the Columbia River drainage should be systematically considered for use in meeting the water budget called for by the Council. We have no preference among the action alternatives B through G because drainage-wide storage availability has not been addressed in this EA. It would seem that Dworshak storage is one of many storage sources that should be used to provide flow for the water budget.

If further study is needed we would suggest that an interim spill plan to aug-
(18) ment passage flows for salmon and steelhead smolts from the Snake River be developed, so that at least a portion of the Council's water budget can be soon met.

We understand that your evaluation for Endangered Species Act impacts is in
(19) progress. We would be glad to informally review this evaluation report.

Thank you for this opportunity to comment on a matter of vital importance to the future of salmon and steelhead in the Snake River drainage.

Sincerely yours,

James F. Gore

James F. Gore
Acting Field Supervisor

cc: FWS/OEC, Washington, D.C.
FWS, RO, Portland (Weaver)
FWS, SE, Boise (Gore)
FWS, FAO, Vancouver (Handy, Olney)
FWS, FAO, Dworshak, Ahsahka (Varley)
IDFG, Hdqtrs, Boise (Richards)
IDFG, Region 3, Boise (Reid)
IDFG, Region 2, Lewiston (Bowler)
NMFS, Portland (Brian Brown)
BIA, Portland (Burnham)
Nez Perce Tribal Council (Johnson)
Clearwater N.F., Orofino (Espinosa)

18. Response.

Compliance with the National Environmental Policy Act must be obtained before an interim plan could be used.

19. Response.

The evaluation for the Endangered Species Act is following guidelines for compliance. We have completed the requirements for implementation of Alternative A or Alternative B. For the other alternatives we will continue to work with the Fish and Wildlife Service on endangered species concerns.

20. Response.

The environmental assessment is scoped to the Corps of Engineers' jurisdictional concern for evaluating recreation at Dworshak. Moreover, water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget request. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows.

21. Response.

This comment is noted.

22. Response.

An incremental analysis method was used in evaluating the recreational impacts at Dworshak.

United States Department of the Interior
NATIONAL PARK SERVICE
Pacific Northwest Region
Westin Building, Room 1920
2001 Sixth Avenue
Seattle, Washington 98121

IN REPLY REFER TO:
FPC-32-2 (PNR-RE)

December 20, 1982

U.S. Army Corps of Engineers
Walla Walla District
Attention: NPWPL-ER
Building 602, City County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

We have received your Environmental Assesment on Dworshak Dam and Reservoir Water Budget Concept transmitted by your letter of November 19, 1982.

We realize this assessment focuses on the nonpower impact on Dworshak and final or absolute figures cannot be provided. We also realize the importance of guaranteed flows for migrations of juvenile anadromous fish.
(20) However, at this preliminary stage it appears as if the flows required to enhance the fishery will have significant adverse impact on the recreation resources at both the reservoir and the downstream area. Some alternatives have greater impacts than others, of course, but those having less impact on Dworshak may have more impact on the recreation resources of Brownlee Reservoir, and those impacts were not addressed.

It is possible that the Water Budget Concept (WBC) cannot be implemented
(21) without impacts upon the recreation resources of Dworshak. However, with the information we have on the WBC we are not satisfied that the alternatives explored are the "only" ones, let alone the "best" ones.

We believe incremental quantification of the impacts on the recreation
(22) resource (or recreation use) would be the most legitimate method of selecting the recommended alternative from the recreation point of view.

We may be in a position to assist you toward this end. If assistance by this office would fit into the Corps' study needs and if you believe NPS might play a role, please feel free to contact Fred Bender, Chief of the Recreation Resources Division at FTS 399-4720.

Sincerely,

T. Allan Comp

T. Allan Comp, Ph.D.
Acting Associate Regional Director
Recreation Resources and
Professional Services

IN REPLY REFER TO

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
PORTLAND AREA OFFICE
POST OFFICE BOX 3785
PORTLAND, OREGON 97208

Colonel Robert B. Williams, District Engineer
U.S. Army Engineer District, Walla Walla
Building 602, City-County Airport
Walla Walla, Washington 99362

Attention: NPW PL-SR

Dear Colonel Williams:

We have reviewed the Draft Environmental Assessment Dworshak Dam and Reservoir Water Budget Concept.

Your effort to address the alternative water management plans for Dworshak relative to the needs of the anadromous fishery is appreciated. However, we question whether the assessment is timely since the viability of each
(23) alternative appears to rely, to a great extent, on what occurs at the Brownlee Project. Since the operation alternatives for Brownlee have not been addressed and since the management limitations of Brownlee may preclude meaningful consideration of one or more of the Dworshak alternatives, it would appear the two operations should be evaluated as part of a combined assessment.

We recognize the objective of the water management effort is to improve the anadromous fishery in which the Columbia River Treaty Tribes have a recognized
(24) interest and for which the Bureau of Indian Affairs has a responsibility relative to trust resource protection. However, we are also aware the Nez Perce Tribe has an interest in protecting the reservoir fishery and their reservoir recreation facility. If the management alternatives for Dworshak have the potential for impacting these resources (i.e., increased reservoir fluctuations) we request the impacts be evaluated specifically in consultation with the Nez Perce Tribe. This does not appear to have been done in the draft environmental assessment .

We appreciate the opportunity to comment on the draft document. If we can be of further assistance, please contact our office.

Sincerely,

Assistant Area Director
(Economic Development)

23. Response.

The environmental assessment evaluates the need to supplement the existing FEIS for Dworshak project. The significance of the impact at Dworshak is the jurisdictional limit in this evaluation. The contribution of Brownlee is used to model the impacts at Dworshak.

24. Response.

We are coordinating with the Nez Perce Tribe concerning the water budget proposal. We will continue to work with the Nez Perce Tribe as part of this environmental process.

25. Response.

We have continued our evaluation to clarify the impacts at Dworshak project. The level of evaluation is designed to provide the decision maker with adequate information to decide if more detailed information of an environmental impact statement needs to be developed. The document provides adequate information.

26. Response.

The two pages referenced discuss different recreational uses. The first discusses boating, the second swimming. Swimming at Dworshak is quite sensitive to reductions in pool elevations because designed swimming beaches are exposed.

27. Response.

Please refer to Response 25.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FEDERAL BUILDING
P.O. BOX 7669
MISSOULA, MONTANA 59807

DEC 23 1982
1990

Col. Robert Williams, District Engineer
U.S. Army Engineer District, Walla Walla
Attn: NPWR-ER
Bldg. 602, City-County Airport
Walla Walla, WA 99362

Dear Colonel Williams:

We have reviewed the Environmental Assessment (EA) prepared by the Corps of Engineers for the Water Budget Concept relating to the Dworshak Project. We believe the effects of the proposed alternatives are not fully assessed and offer the following comments:

1. Analysis of the document is hindered because most of the effects of alternatives are described subjectively. For example: "fishing effort may be reduced," "higher flows may result in adverse impacts," "increases
(25) in the number of minor, moderate, and major reductions in boating use," and "an adverse impact on hunting." To judge impacts of the various alternatives on recreation, these effects need to be quantitatively described and listed in a fashion that permits comparison.

2. There appear to be contradictory statements about impacts on recreation. The most noticeable are page 14, paragraph 2 v. page 17, last
(26) paragraph:

a. "When pool levels drop below 1595 msl, there is a minor drop in shoreline use . . . ."

b. "The number of years with pools below 1595 msl in July will increase . . . During these years, swimming will be drastically reduced . . . ."

3. We suggest including specific discussions of the social and economic impacts to the reservoir user and concessionaires and adjacent communi-
(27) ties. Their economic dependence on summer recreation users could be a significant factor.

Impacts to recreation become significant at pool level 1580. The number of years when this level occurs ranges from 6 to 17 years out of 40 in the prime recreation season. This is a range of 15 to 40 percent of the time span. Recreationists (particularly local residents) who have purchased boats, planned recreation or have come to depend on the reservoir for daily recreation outings may find their opportunities diminished severely. With an undependable recreation resource, use could drop significantly and local dependent businesses adversely affected.

4. The analysis should also identify the effects of the various alternatives on log transportation from adjacent private and Forest Service
(28) lands. Private companies are currently constructing log transport facilities and the Forest Service has two planned sales that will require water transport for the full length of the reservoir. Dependability of pool level is a major factor in the location and construction of these facilities. In addition, log purchasers without dependable transport will be impacted economically because they will not have control over their stumpage inventory and harvest schedules. Contractual agreements between buyers and sellers will be difficult to meet due to conditions beyond their control. Damage claims may result if down timber is not transportable for a year or more.

5. Include a benefit-cost analysis of the overall proposal. Consider
(29) local economics, power generation opportunities, recreationists, reservoir and upstream fisheries and the timber industry.

Overall we recommend a more comprehensive assessment before concluding whether an environmental assessment is adequate or an EIS is necessary.

Thank you for the opportunity to review and comment.

JAMES E. REID
Director of Planning,
Programing and Budgeting

28. Response.

The use of the reservoir for log transport has been reevaluated to obtain a clearer estimate of impacts from the water budget. No major log transport program has been occurring, but future use could be influenced. Future contracts would have to consider new reservoir fluctuations.

29. Response.

The power benefit is not being analyzed with this assessment. We are evaluating nonpower impacts to determine if a supplement should be prepared.

30. Response.

The environmental assessment was developed to determine if implementing the water budget proposal would require the supplementing of the existing FEIS. Each agency would have to make a decision under NEPA whether or not their operational change from the water budget proposal warranted supplementing the EIS for their project.

31. Response.

The projected impacts at Dworshak for the alternatives are based on operation models to meet water budget flows. The assessment will determine the need for supplements under each alternative. This assessment has identified which alternative modes of operation can be implemented at Dworshak without adversely impacting the nonpower resources at Dworshak.

United States Department of the Interior
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY REFER TO: PN 150
125.1

DEC 23 1982

Col. Robert B. Williams, District Engineer
U.S. Army Engineer District
Attn: NPWPL-ER
Building 602, City-County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

The environmental assessment (EA) you provided concerning the nonpower impact on the Dworshak Project as a result of the implementation of the Water Budget Concept (Northwest Electric Power Planning and Conservations Council's Fish and Wildlife Program) has been reviewed by our staff. The following comments are provided for your use in considering further NEPA compliance requirements.

The EA does not cover the full range of impacts, systemwide, which will occur as a result of implementation of the water budget concept. How any
(30) one dam in the system operates effects how all the other dams must operate to achieve the overall releases. A document with such a narrowly defined range of analysis does not provide the reviewer with an understanding of the impact of Dworshak operating mode on power, irrigation, resident and anadromous fisheries, wildlife, water quality, etc. throughout the Columbia River Basin. For example, it should be noted that the studies used in the EA did not include the fish flow requirements that the Montana Fish, Wildlife and Parks has proposed for Hungry Horse Project. The impact of Hungry Horse operation on Dworshak Project could be slightly greater draft in October, November, and December when Hungry Horse outflow is restricted.

The fact that no "preferred" alternative was indicated adds to the difficulty of determining the degree of impact in other areas within the system. The final selection of an operation alternative at Dworshak will influence the
(31) operations at the Bureau's Grand Coulee and Hungry Horse Projects and, correspondingly, the impact of such operations.

Thank you for the opportunity to review this document.

Sincerely yours,

L. W. Floyd

Regional Director

IDAHO STATE HISTORICAL SOCIETY
610 NORTH JULIA DAVIS DRIVE BOISE, 83702
STATE HISTORIC PRESERVATION OFFICE

November 26, 1982

Robert B. Williams
U.S. Army Engineer District Walla Walla
Building 602, City-County Airport
Walla Walla, WA 99362

ATTN: NPWPL-ER

Dear Colonel Williams:

Thank you for providing us a copy of your Dworshak dam nonpower impact assessment (NPW PL-ER) of November 19. Although a Galloway dam alternative could not be analyzed yet, we should note that such a project is
(32) likely to have some impacts upon cultural resources, in contrast to your other alternatives. If that proposal is developed, this feature no doubt will be noticed.

Sincerely,

Merle Wells

Merle W. Wells
State Historic Preservation Officer

STATE

32. Response.

We will consider cultural resource protection should the Galloway Dam project be developed.

33. Response.

This comment is noted.

34. Response.

The Federal Energy Regulatory Commission (FERC) would be the Federal agency to review the Idaho Power Company's activities for NEPA compliance. The Corps of Engineers may be a cooperating agency with FERC on any environmental documents developed, but Brownlee project is not within our jurisdiction. In addition, water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget report. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows.

35. Response.

This comment is noted.

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 13, 1982

Col. Robert B. Williams
District Engineer
U.S. Army Corps of Engineers
Building 602
City-County Airport
Walla Walla, WA 99362

ATTENTION: NPWPL-ER

Dear Col. Williams:

This is to provide our comments on your environmental assessment of use of Dworshak Reservoir to provide water for the "water budget concept" of the Northwest Power Planning Council. Because the water budget is only a concept, not a plan, it is not possible to do a complete assessment of its effects. The assessment is as definitive as the water budget concept permits at this time. (33)

We would have preferred to have seen an environmental assessment of the effects on both the Snake and Clearwater rivers resulting from use of Dworshak and Brownlee reservoirs to provide the water budget flows. While the reservoir impacts at Brownlee may not be the Corps' responsibility to describe, your responsibilities for navigation and flood control management will require your involvement in an evaluation of Snake River impacts. We understand your division office is working with Idaho Power Company to improve the base case simulation of Brownlee operation. After that is accomplished, we would hope you would re-run a similar range of alternatives and include a description of impacts in the middle Snake River area. We are particularly interested in the effects of water budget releases on the ability to meet the navigation flow requirements at Lime Point. (34)

We disagree with your tentative finding of no significant impact at Dworshak. Dworshak Reservoir is a major recreational resource for the state and region. A potential damage to recreation values in ten to fifteen percent of all years is not insignificant. (35)

Sincerely,

Ken

A. KENNETH DUNN
Director

AKD:alw

IDAHO DEPARTMENT OF FISH AND GAME
600 South Walnut • Box 25
Boise • Idaho • 83707

December 20, 1982

Colonel Robert B. Williams
U. S. Army Engineer District, Walla Walla
ATTN: NPWPL-ER
Bldg. 602, City-County Airport
Walla Walla, Washington 99362

Dear Colonel Williams:

We have reviewed the Draft Environmental Assessment (DEA) and Draft Findings of No Significant Impact (DFONSI) for the nonpower impacts to the Dworshak Project created by meeting the Water Budget Concept of the Northwest Power Planning Council's Fish and Wildlife Program. Your timely response in preparing these documents in a matter which is so important to maintaining and restoring the salmon and steelhead runs of Idaho and the entire Columbia Basin is appreciated. Our general and specific comments follow.

The DEA appears to depict most of the possible negative nonpower impacts of alternatives A-G, but fails to recognize the most important positive impact produced by all alternatives except the no action alternative, A. That positive impact is
(36) the incremental benefit to the entire Snake River and the Dworshak project area, in particular, of increasing the return of adult salmon and steelhead by additional water for downstream migration. While the DFONSI shows some recognition of this fact by indicating which alternatives can meet the target flows, there is nothing in the body of the DEA to indicate any likely differential in adult fish return under any of the alternatives. Improved adult returns is the goal of the Water Budget Concept.

The DEA does not fully respond to the implementation of the Water Budget Concept by holding flood control rule curves and power releases constant for all the described alternatives. Section 304(a) of the Fish and Wildlife Program contains
(37) specific language instructing the Corps to re-examine its flood control requirements and for power managers to flex power production operations to better accommodate the Water Budget. The nonpower impacts of all the alternatives in the DEA could be mitigated to some extent by changing firm power production and/or flood control management.

• EQUAL OPPORTUNITY EMPLOYER •

36. Response.

We have included a discussion of this in the document. Please refer to Response 11.

37. Response.

This document reflects the nonpower impacts from water budget implementation. The Corps is considering a systemwide study of flood control purposes that will require several years to complete. Any change in authorized flood control purposes of a Federal project will require Congressional reauthorization.

38. Response.

This comment is noted.

39. Response.

Water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget request. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows. However, we have discussed the impact on steelhead fishing in the recreation section.

40. Response.

The time of recreation usage was taken into account as impacts were evaluated.

41. Response.

We have made the change to indicate smallmouth bass instead of kokanee.

42. Response.

This comment is noted.

(38) Page 8, Rainbow trout. Comment - We believe the implication that the majority of terrestrial insects appearing in the trout diet in the spring are made available by the water rising in the reservoir is not well substantiated and is probably an overstatement of the potential detrimental impact.

(39) Page 13, a. Downstream fishing. Comment - This section ignores fishing for steelhead which is by far the greatest fishing use the Clearwater River below Dworshak Dam receives. Alternatives B-G would tend to reduce high flows and improve fishing opportunities during much of the steelhead season.

(40) Page 14, b. Reservoir boating (paragraph 3). Comment - We believe the drop in boating use related to reservoir levels below 1590 may be more closely related to time of year rather than reservoir level. Generally, under base case conditions the reservoir does not drop below 1590 until September which is the end of the summer vacation period. Elevations below 1590 earlier in the year would probably not be as closely correlated to a decrease in boating use as it is in September.

(41) In the fourth paragraph of the DFONSI, a reference is made to kokanee losing spawning habitat with lower pool levels. This should be changed to read, "smallmouth bass" rather than kokanee. Winter spill which results from flood control management is one of the most detrimental impacts to kokanee and occurs under every alternative unless alternative flood control and/or power generation operations are evaluated.

(42) None of the alternatives evaluated appear to pose irreversible negative impacts. Clearly, in light of the Fish and Wildlife Program, the no action alternative (A) is unacceptable. Alternative B does not meet the target flows in all years, and is probably unrealistic in assuming that Brownlee would provide all the remaining flow to reach the 85,000 cfs objective. Alternatives C and D probably come closest to meeting the Water Budget Concept with minimal negative nonpower impacts. However, alternative flood control and/or power production releases would relieve some or all of the negative nonpower impacts of all the listed alternatives.

Sincerely,

Jerry M. Conley
Director

cc: Region 2
Columbia Basin Fish and Wildlife Council

offer no objections to the Corps finding of no significant impacts with respect to the impacts of the water budget on Dworshak reservoir operations.

Sincerely,

Brett Wilcox
Executive Director

2D001:E/1
cc: Herb Kennon
Ed Sienkiewicz
Ed Sheets

DIRECT SERVICE INDUSTRIES, INC.
1290 Lloyd Center Tower • 825 N.E. Multnomah Street
Portland, Oregon 97232
(503) 233-4445

December 8, 1982

U. S. Army Engineer District, Walla Walla
Attn: WPWPL-ER
Building 602, City County Airport
Walla Walla, Washington 99362

We appreciate the opportunity to review and comment on your Environmental Assessment (EA) of the impacts on the Dworshak project and its environs of providing water budgets included in the Regional Planning Council's Fish and Wildlife Plan. The Direct Service Industries, Inc. recognize the need for and support programs to protect, mitigate and enhance fish and wildlife impacted by development of the region's hydroelectric systems while assuring the adequate, reliable and economic power supply system.

The principle concern of the DSIs in modifying hydro system operations to provide the water budget is the impact such operations may have on the availability of and recall requirements for Advance Energy (and Flexibility Energy) essential to DSI top quartile loads. Fish flow operations in the April-June period reduce the number of months during which this "borrowed" energy
(43) can be returned. In recognition of this, the Memorandum of Understanding among BPA, the Corps and the Bureau of Reclamation, BPA Contract No. DE-MS79-82BP90930, was modified in August 1982 to advance possible recall from March 1 to February 1 of any year following reservoir drafts for supply of Advance Energy if recall is determined to be necessary by the project operator to restore reservoirs for non-power purposes. The earlier return obligation deteriorates the quality of service for DSI top quartile loads; e.g. unnecessary returns could be initiated on unreliable January snow pack data and subsequent precipitation make the returns unnecessary.

Your EA does not address the impacts of water budget operations on power supply. However, from numerous discussions we understand there is a high probability that the supply of Advance
(44) energy can be accommodated without further deterioration in the quality of service anticipated under the August 1982 Memorandum of Understanding. If this understanding is correct, the DSIs

43. Response.

This concern was addressed in BPA's environmental assessment, "Proposed Power System Changes to Implement the Water Budget."

44. Response.

See the above response.

SNAKE RIVER
HYDRO POWER

IDAHO POWER COMPANY

BOX 70 BOISE, IDAHO 83707

D. E. BARCLAY
VICE PRESIDENT

December 17, 1982

U S Army Engineer District
Walla Walla
Bldg 602, City-County Airport
Walla Walla, Washington 99362

Attention: NPWPL-ER

Dear Sir:

This letter constitutes the comments of Idaho Power Company ("Company") on the Draft Environmental Assessment ("Draft EA") prepared by the U S Army Corps of Engineers ("Corps"), Walla Walla District, to assess the non-power impacts on the Dworshak Project as that project is used to provide water for the Water Budget ("Water Budget") established in the Northwest Electric Power and Conservation Planning Council's ("Council") Fish and Wildlife Program ("Program").

With respect to the Snake River, the Water Budget calls for an amount of water up to 20,000 cfs months at Lower Granite Dam during the April 15 to June 15 period. This water is to come from water releases at Dworshak and Brownlee Reservoirs.

You are correct when you state in the Introduction that "Idaho Power Company has made no commitment to participate in providing flows for water budget requirements." As you are aware, (45) the Company is continuing to discuss with the Corps a proper allocation of participation between Dworshak and Brownlee Reservoirs for Water Budget implementation.

The Company does not believe that an adequate Draft Environmental Assessment can be prepared based upon the alternatives utilized. The reason for this is that several improper assumptions were made in preparing the water budget studies. The results (46) of which limit the drawdown at Dworshak Reservoir to levels which are considerably higher than is realistic. Some of the improprieties which have significant impact on the results of the Corps' Water Budget studies are as follows.

First, the Corps ignored the flood control requirements, which they obligate the Company to comply with, by filling Brownlee Reservoir on April 30 in twenty out of forty years. In actual practice, in only two years since completion of the Brownlee facility has it been filled by April 30. The result of this approach is to allow retention or refill of Brownlee Reservoir followed by a water

45. Response.

This comment is noted.

46. Response.

The model for Dworshak Reservoir elevations was based on the 40-year (1928-1968) data. The alternative mode of operation at Dworshak for the water budget did include flows from Brownlee project. These flows were included to determine how often the target flow at Lower Granite would be met. There was no intent in the studies to develop operating criteria for Brownlee project as this is the responsibility of the Idaho Power Company and the Federal Energy Regulatory Commission.

47. Response.

As noted in your last sentence of this comment, North Pacific Division is working with the company to determine participation in the water budget requirements.

48. Response.

Please refer to Response 4. The power aspects of the water budget are being studied by BPA. The administration will provide power to replace that lost at Brownlee.

49. Response.

The model used to simulate the impacts of the water budget proposal reflects the historic period of downstream fish migrations to allow the decision maker to determine which mode of operation meets water budget requirements without adversely impacting nonpower purposes of Dworshak project.

budget draft as opposed to the flood control draft followed by the water budget draft. In actual practice, on April 30, the reservoir is normally somewhere between elevations of 1976 and 2034
(47) or anywhere from empty to half full of live storage, resulting in substantially less storage compared to the Corps' studies and hence reduced ability to contribute to the fish flush. The project 1971 license requires that the Brownlee Reservoir be lowered to elevation 2034 on March 1. That is approximately one-half empty with respect to live storage. Further, the Corps can require that Brownlee be lowered to elevation 1976 or empty with respect to live storage on April 1. After April 1, the Company can start storing or recapturing water only when the Corps permits. The Company appreciates that the Council has requested the Corps "... to examine its flood control requirements to insure achieving a proper balance among the multipurpose uses of projects, including the water budget." A revision in the Corps flood control plan to permit the Company to retain water which is normally released or not stored, to some extent, would reduce the impact of the water budget on Brownlee. Since November 19, the date of the Draft Environmental Assessment discussions between the Comapny and the Corps have resulted in an adjustment of the flood control rule curve to be used in performing water budget studies.

Secondly, the studies performed did not take into account the load requirements of Idaho Power Company's customers. The study was conducted based on regional load requirements which do not take into consideration the summer load requirements of Idaho Power Company's system. By performing the studies with northwest regional loads
(48) with winter peaks and in effect for running it for purposes of providing water for downstream reservoirs, the model filled the reservoir in low water years without regard for load requirements and did not provide for drafting to meet summer peaks. In some years Dworshak was storing water while Brownlee is being drafted. In effect the loads utilized were artifically low and resulted in more stored water, higher head, more generation and therefore less impact. However, even with the improper use of Brownlee storage the impacts on Brownlee Reservoir were considerably greater than those at Dworshak.

Finally, the studies conducted are not necessarily consistent with the water budget program as set forth in the program. It assumes that the water will be made available during a four-
(49) week period in May when in fact the water could be requested as early as April 15 and as late as early June to meet the June 15 deadline. Further, the water could be requested over a shorter period of time, say two weeks, as opposed to four weeks, or a longer period of time, say six weeks as opposed to four weeks. Each scenario will have substantially different impacts.

In conclusion, if the Corps is expecting to realistically fulfill the objectives of the water budget, the volume of water releases from Dworshak will have to increase substantially because
(50) the volume of water releases assumed for Brownlee Reservoir will not be available. As stated earlier, the Company is continuing to work with the Corps of Engineers and the Bonneville Power Administration to resolve the problems which have been outlined. In our opinion, until these differences are resolved it would not be reasonable to make an environmental assessment based on the improper assumptions in the studies which were selected.

DEB:jg

D E Barclay

50. Response.

See Response 46. The Corps will continue to work with the company and BPA to resolve concerns related to meeting water budget target flow at Lower Granite.

51. Response.

The environmental assessment covers the impact on the nonpower operations at Dworshak Reservoir. The water budget power concerns are addressed by BPA. Please refer to Response 4. Information in this assessment will be used to determine the need for a supplement to the FEIS for Dworshak project. Moreover, water budget flows will not impact the maximum and minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget request. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with the water budget flows.

52. Response.

Please refer to the above response.

THE WASHINGTON WATER POWER COMPANY

Electric and Natural Gas Service

P.O. BOX 3727 • SPOKANE, WASHINGTON 99220 • (509) 489-0500

FRED A. SHIOSAKI
MANAGER
ENVIRONMENTAL AFFAIRS

December 22, 1982

Colonel Robert B. Williams
U.S. Army Engineering District, Walla Walla
Attention: NPWPL-ER
Building 602, City-County Airport
Walla Walla, WA 99362

Dear Colonel Williams:

The following are comments by The Washington Water Power Company on the November 19, 1982 Environmental Assessment and draft Finding of No Significant Impact for implementing the water budget concept at the Dworshak project. Our concerns are primarily with the procedural direction taken by the Corps of Engineers in the preparation of the Environmental Assessment and the development of the finding of non-significance. By limiting the assessment to the project-specific, non-power impacts, the full significance of the alternatives for augmenting instream flows has not been (51) evaluated. It may be that at some level of flow augmentation, non-power impacts will be insignificant at the Dworshak project. However, a contribution of flows from the Dworshak project, coupled with other actions intended to achieve a larger, regional goal of instream flows, will likely have significant direct, indirect, and cumulative power and non-power impacts. Impacts on future resource uses and the environment may also be compounded by the need for additional capacity to replace the Dworshak increment of the calculated 550-mw regional loss of firm power.

Considering the interdependence of the proposed action at Dworshak with a regional action, it appears the scope of the assessment must be enlarged to fully comply with the National Environmental Policy Act. Implementation of (52) such a major management action which would alter project operations and have significant economic consequences requires a more complete assessment which addresses the incremental impact of the proposed alternatives to the regional system. Any findings which result from the assessment as it is now written can only be considered partial compliance with the National Environmental Policy Act because of the limiting assumptions which were used. If the scope of this assessment is not enlarged, the final documents should state the perceived process as to how such a limited assessment and

finding may be used in evaluating the overall significance of the alternative actions to the power and non-power values of the regional system.

Environmental Assessments require brief discussions of the significant effects of action alternatives, including impacts which are direct, indirect,
(53) and cumulative. These terms are all well defined in 40 CFR 1508.7, 1508.8, 1508.9, and 1508.27 and served as reference for the above comments. Title 33 CFR 230.6(d), 230.7(c) and Appendix B(8) of 33 CFR 230 also served as reference for these comments.

Thank you for the opportunity to review these environmental documents.

Sincerely,

Fred A. Shiosaki
Manager, Environmental Affairs

RDW:wpc

cc: Executive Department
G. Prekeges
L. Wimer - IPCo.
M. Schultz - ICP
A. Wright - PNUCC (F&W Comm.)

53. Response.

This comment is noted.

54. Response.

The water budget power concerns are addressed by the BPA. Please refer to Response 4.

PNUCC

PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

December 30, 1982

Colonel Robert B. Williams
Department of the Army
Walla Walla District Corps of Engineers
Building 602, City-County Airport
Walla Walla, WA 99362

Dear Colonel Williams:

Our comments on the draft: "Environmental Assessment - Dworshak Dam and Reservoir Water Budget Concept" are as follows:

Reference Page 1, Paragraph 1

Contained in the paragraph is the statement: "This environmental assessment discusses the nonpower impacts of implementing the Water Budget Concept only on the Dworshak project."

(54) The PNUCC feels that power impacts need to be addressed in the assessment. The Fish and Wildlife Program states in Section 304 (a)(4) that "the Water Budget is expected to result in the annual loss of 550 megawatts (MW) of firm energy load carrying capability .. " (FELCC). This will result in a significant impact to the power system. At the very least the assessment should address the additional power requirements that will be needed to replace the lost FELCC and the cumulative impacts placed upon other generating facilities in the region.

We appreciate the opportunity to comment on your draft assessment.

Sincerely,

Rich Nassief

Rich Nassief
Deputy Director

RN/jr:104L

PNUCC · 520 SW SIXTH AVENUE, SUITE 505 · PORTLAND, OR 97204 · (503) 223-9343

Nez Perce
ECONOMIC AND COMMUNITY DEVELOPMENT
Box 365
LAPWAI, IDAHO
83540
(208) 843-2253

December 6, 1982

District Engineer, Walla Walla District
U.S. Army Corps of Engineers
ATTN: NPWPL - ER
Bld. 602, City - County Airport
Walla Walla, Washington 99362

RE: DRAFT EA DWORSHAK DAM AND RESERVIOR WATER BUDGET CONCEPT

District Engineer:

The Nez Perce Tribe has reviewed the draft EA for adherence to the "National Environmental Policy Act of 1969" and its implementing regulations and issues the following statement:

(55) 1. That to comply with NEPA, a "NEPA process" should include the following steps.

a) A receipt of a proposal for action.

b) A step to obtain a range of alternates for the commitment of the available resource.

c) The preparation of draft EA or EIS.

d) Comments on the draft EA or EIS.

e) Preparation of a final EA or EIS.

f) Decision on the proposal.

(56) 2. The Nez Perce Tribe declares this EA to be premature. At the present time the Corps is already in step d. of the above "NEPA process" and the Nez Perce Tribe can only submit adversary comment (40 CFR 1500.5 (b)).

(57) 3. The EA did not address the Economic Impacts in the area, specifically the Nez Perce Tribal Marina.

(58) 4. An alternate was not included that would enhance the operation of the Nez Perce Tribal Marina or operate the reservoir in the best public interest for use, especially for recreation.

Economic Development Program

55. Response.

This comment is noted.

56. Response.

Any comments may be submitted. The process is open to suggestions. Overlooked items of importance can be included in the document.

57. Response.

The assessment includes a discussion on the social impacts in the cultural considerations in Part 5 - Manmade Facilities and Activities.

58. Response.

This was not within the purpose of the assessment. The assessment evaluates the need for supplementing the existing FEIS because of impacts from the water budget.

59. Response.

This comment is noted.

60. Response.

This comment is noted.

61. Response.

The Corps of Engineers is working on minimizing the loss of kokanee within the reservoir. The natural tendency for the kokanee to follow downstream currents results in much of this loss. The Corps of Engineers tries to operate the dam's intake structure at depths to avoid the fish.

(59) 5. The Nez Perce Tribe requests that these impacts be assessed as they are the Corps' responsibility to do so.

(60) 6. An enhancement alternate would include the following:
That from high pool a drop of no more than 5 feet and then stabilization at that drop depth would be most beneficial and would allow for -

a) Runoff containment.
b) Best for fishing on reservoir.
c) Recreation would be maximized - this would result from not depriving the public of a lower lake.
d) Camping areas would have beaches.
e) 60-70% of all debris would be contained in the 5 foot zone and not in reservoirs.
f) A 5-foot drop would also allow a stabilization of temperature.

(61) The Marina operator has noted the public awareness of the loss of resident fish due to the underwater withdrawal. Efforts should be made to mitigate this loss.

Thank you,

James Lawyer

James Lawyer
Research Data Planner
Planning Branch

JL:sj

	Soil Quality	Water Quality - Reservoir	Water Quality - Clearwater	Air Quality	Flora - Aquatic	Flora - Terrestrial	Fauna - Aquatic	Kokanee	Smallmouth Bass	Rainbow Trout	Macroinvertebrates	Fauna - Terrestrial	Deer Family	Riparian Mammals	Waterfowl	Birds of Prey	Food Web	Land Use - Wetlands	Fishing - Downstream	Fishing - Reservoir	Boating	Mini-Camps	Camping	Hunting	Aesthetics	Debris Control	Log Transportation			
Alternative A Base	0	0	-	0	0	0		0	-	0	0		0	-	0	0	0	0	0	-	-	-	-	X	-	-	-			
Alternative B WMPCC#3	0	0	-	0	0	0		0	-	0	0		0	-	0	0	0	0	+	-	-	-	-	X	-	-	-			
Alternative C WMPCC#4	0	0	-	0	0	0		0	-	0	0		0	-	0	0	0	0	+	-	X	X	X	X	-	-	X			
Alternative D WMPCC#2	0	0	-	0	0	0		0	-	0	0		0	-	0	0	0	0	+	-	X	X	X	X	-	-	X			
Alternative E WM5HA-3	0	0	-	0	0	0		0	-	-	0		+	-	0	-	0	0	+	X	X	X	X	X	-	-	X			
Alternative F 81WGF	0	0	-	0	0	0		0	-	0	0		0	-	0	0	0	0	+	-	X	X	X	X	-	-	X			
Alternative G CRITFC5	0	0	-	0	0	0		0	-	-	0		+	-	0	-	0	0	+	X	X	X	X	X	-	-	X			

Significant Pool Elevations

1590 Mini-camps (June - August)
1580 Camping (June - August)
1590 Boating (June - August)
1560 Hunting (September - November)
1580 Log Transportation (June - October)
1580 Fishing (June - August)

X Significant Adverse
- Minor Adverse
0 Minimal Variations
+ Minor Beneficial

Matrix Sheet

FISH & WILDLIFE PROGRAM WATER BUDGET

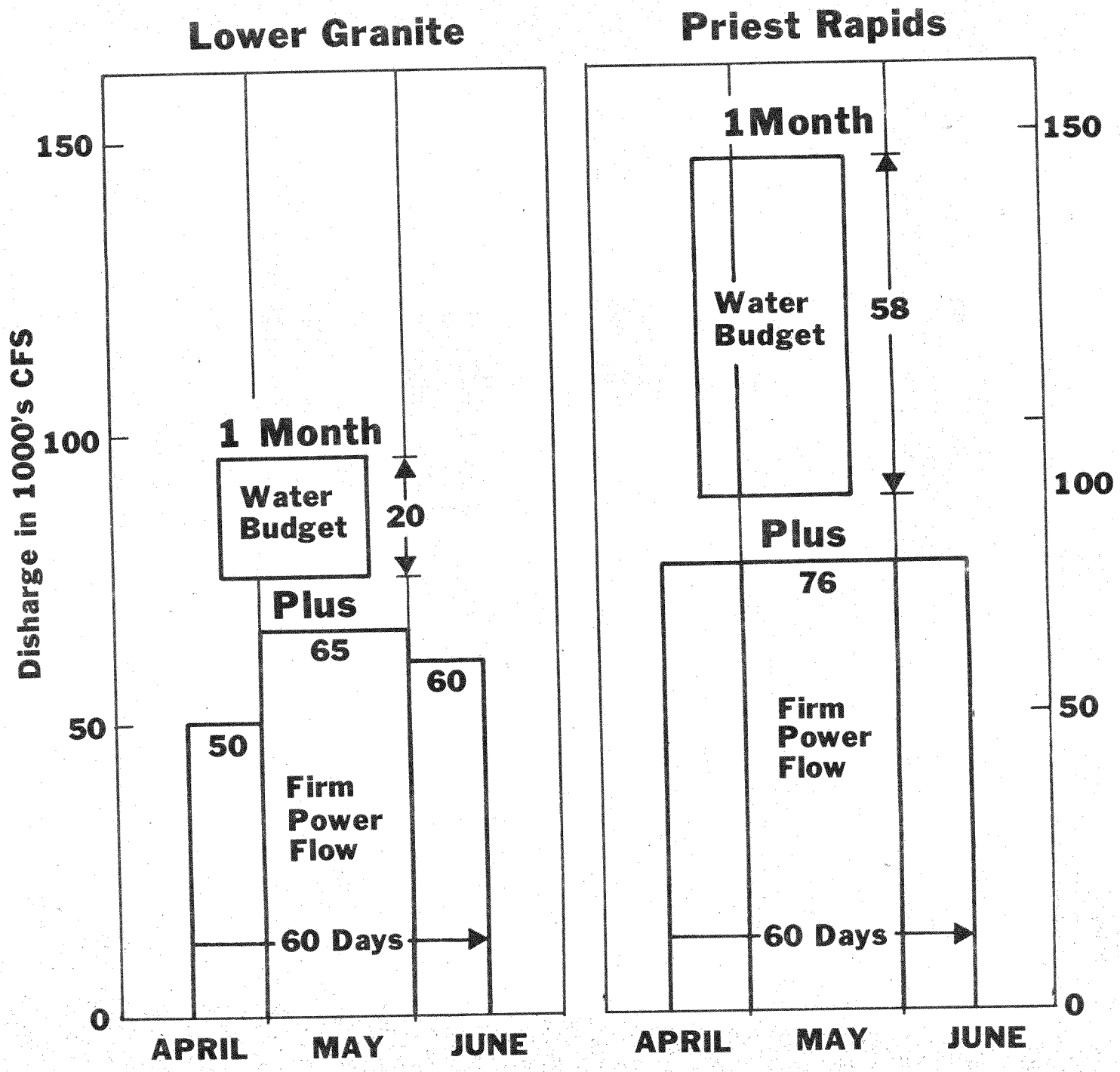


FIGURE 1

HYDRO GENERATION WITHOUT AND WITH WATER BUDGET

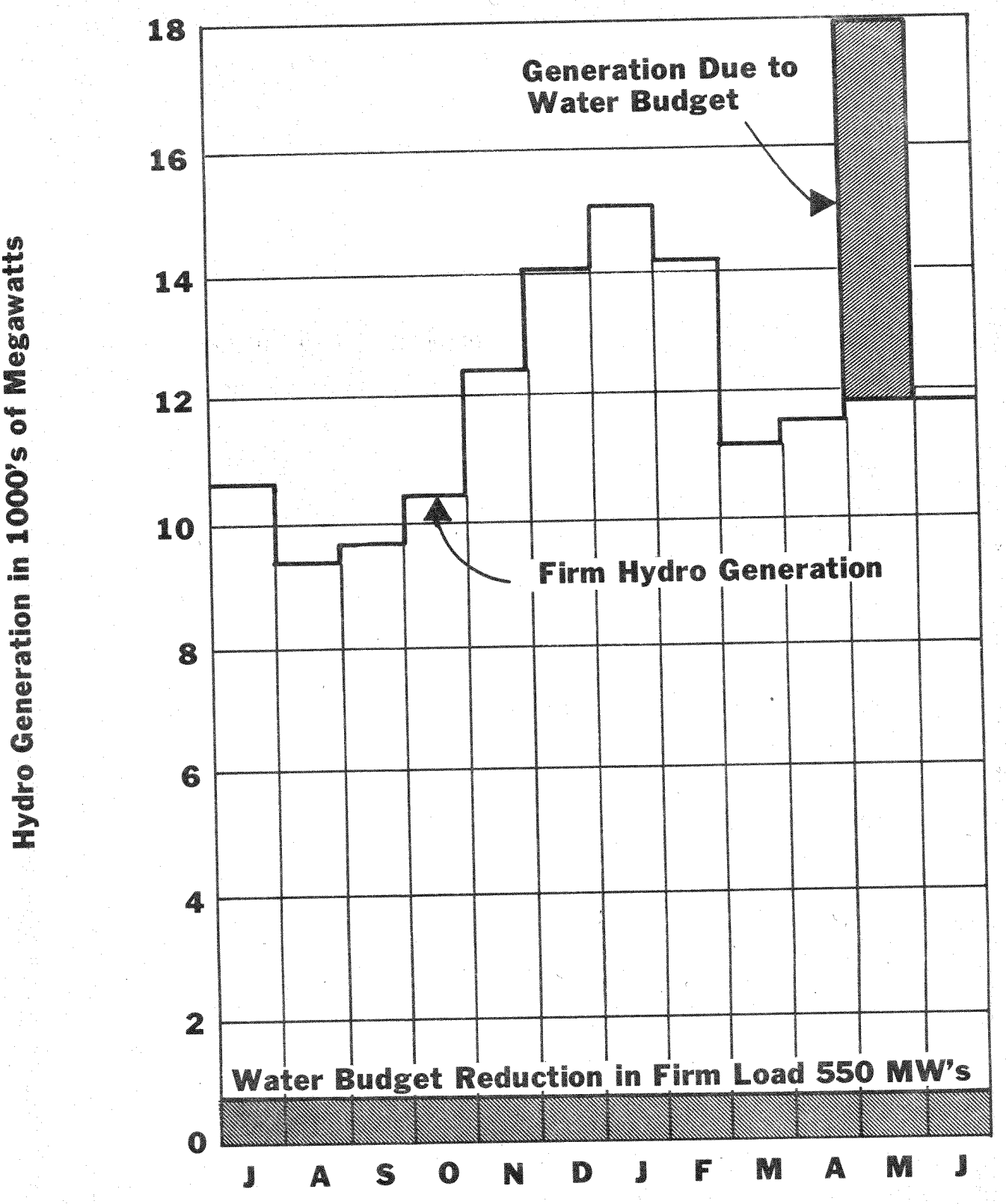


FIGURE 2

DWORSHAK RESERVOIR FLOOD CONTROL RULE CURVES

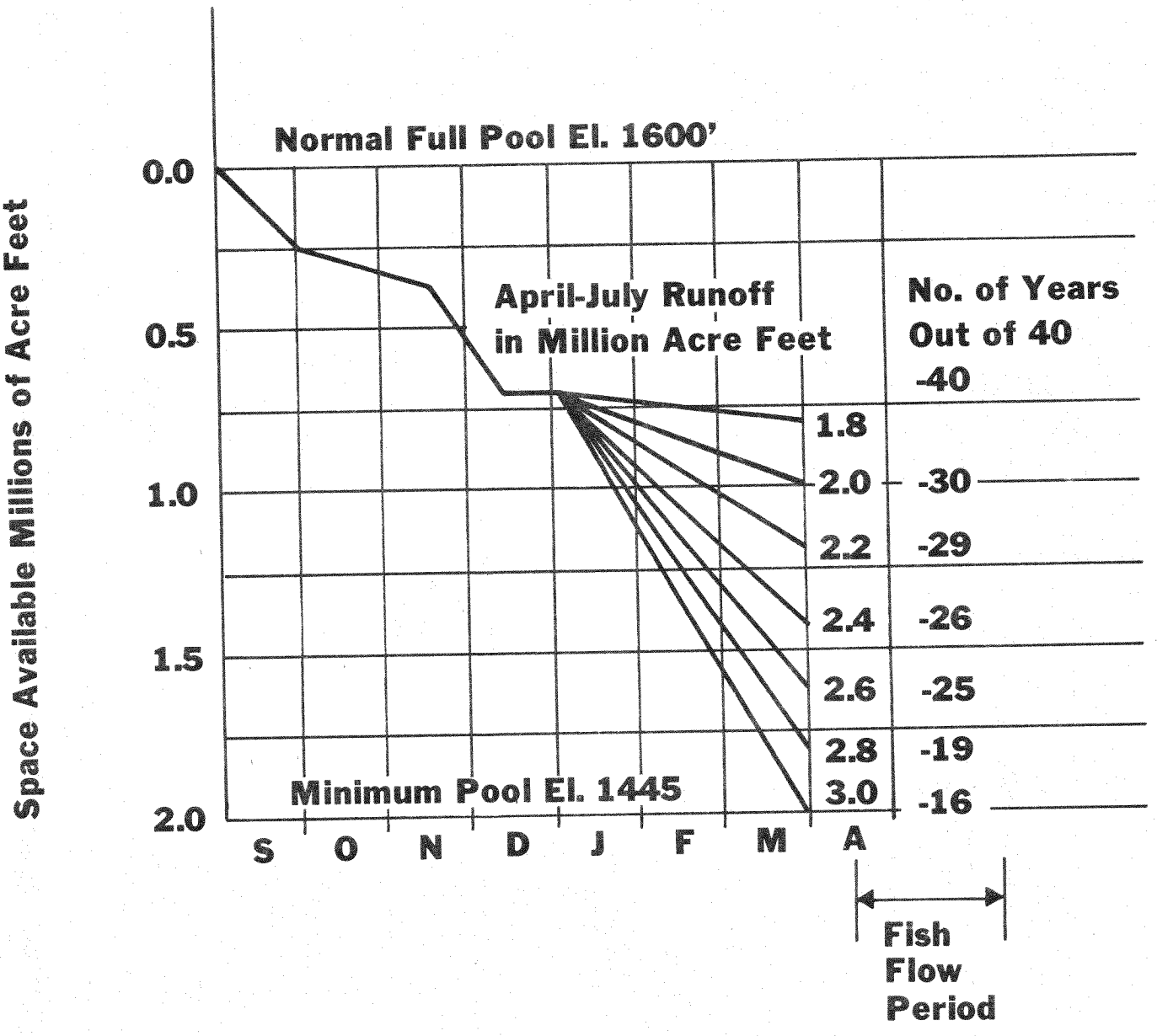


FIGURE 3

LIBBY RESERVOIR
FLOOD CONTROL RULE CURVES

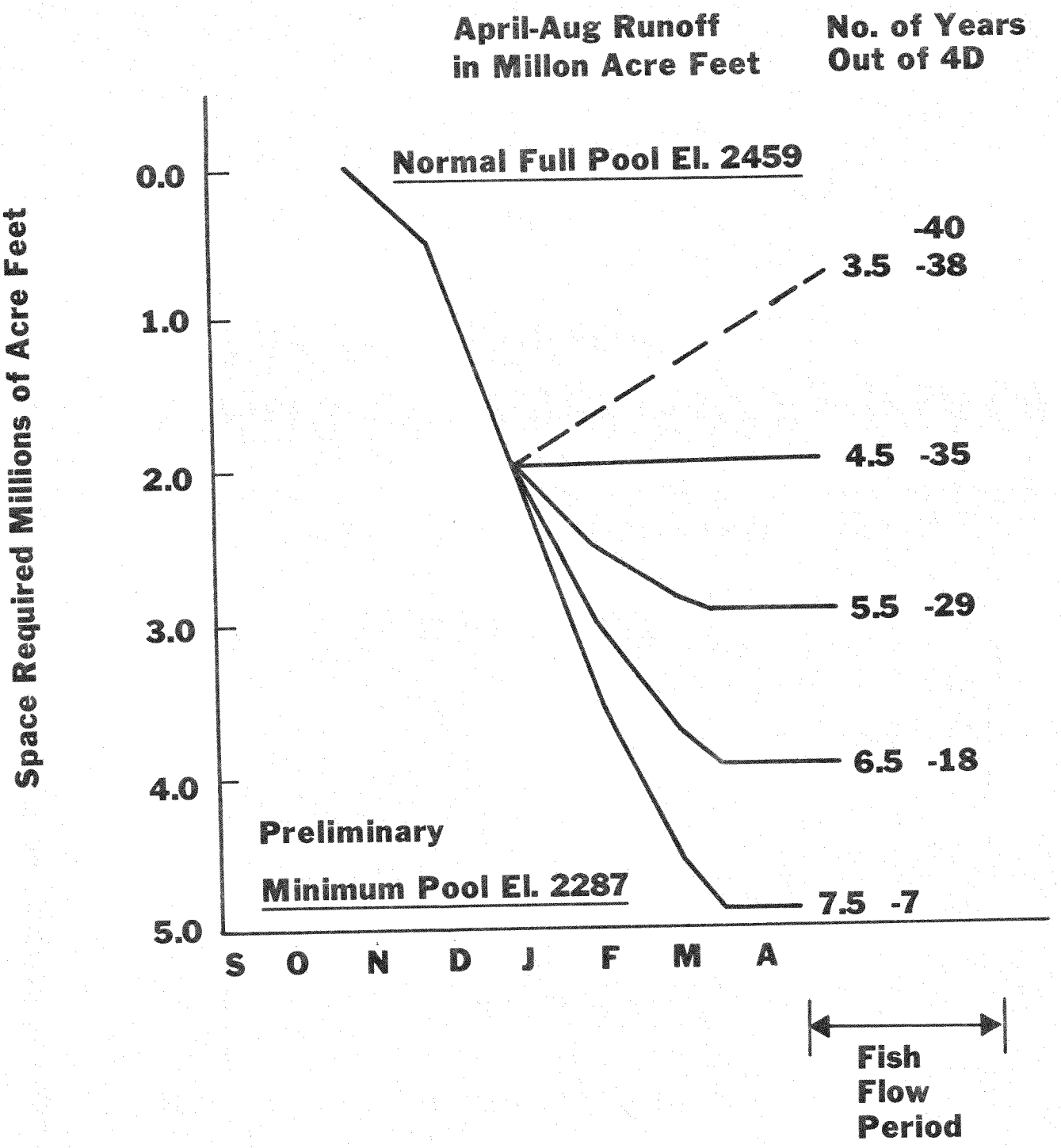
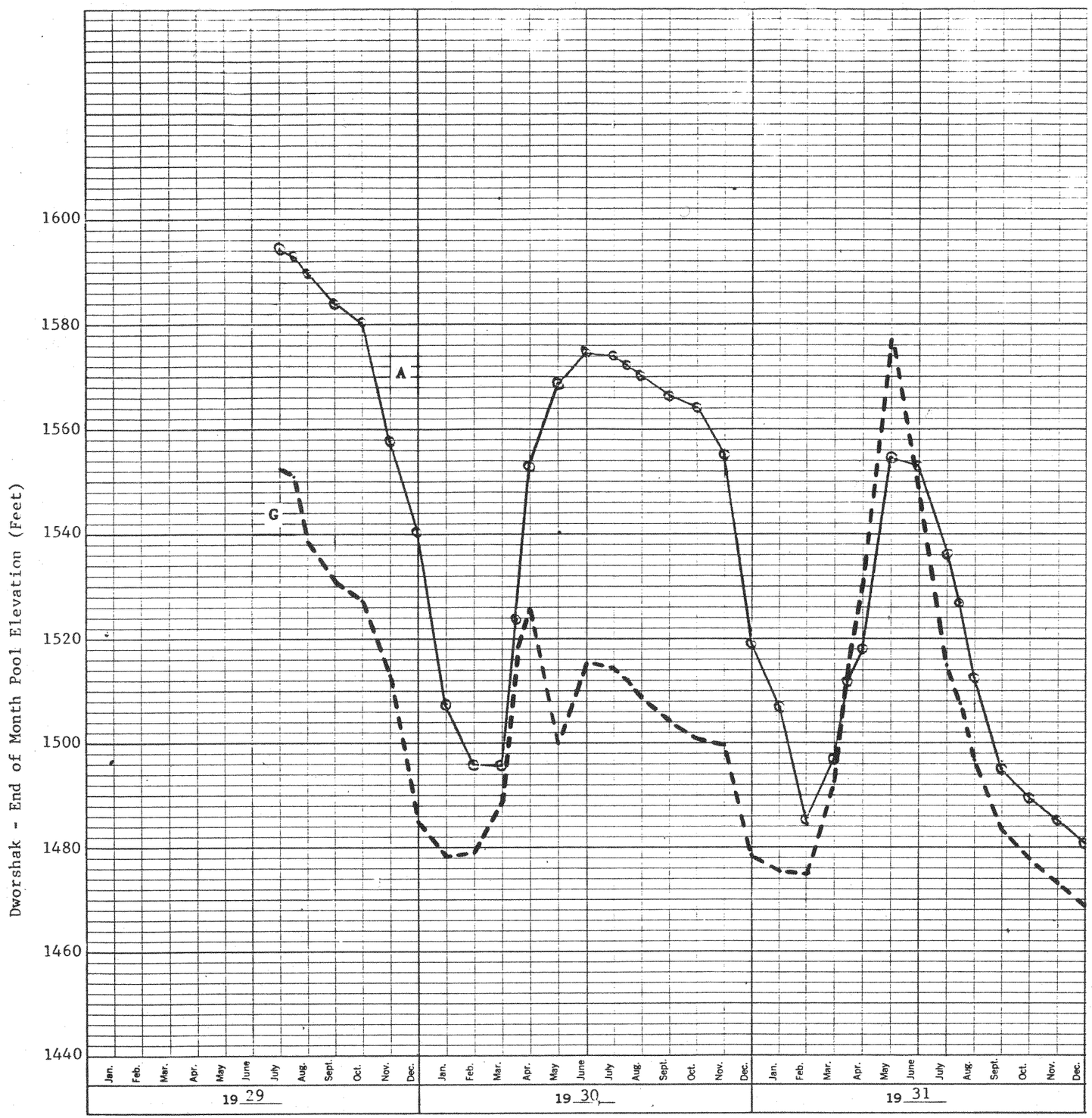


FIGURE 4



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

(Study Data from NPDEN-WM-P)

Alternative G (CRITFC5)

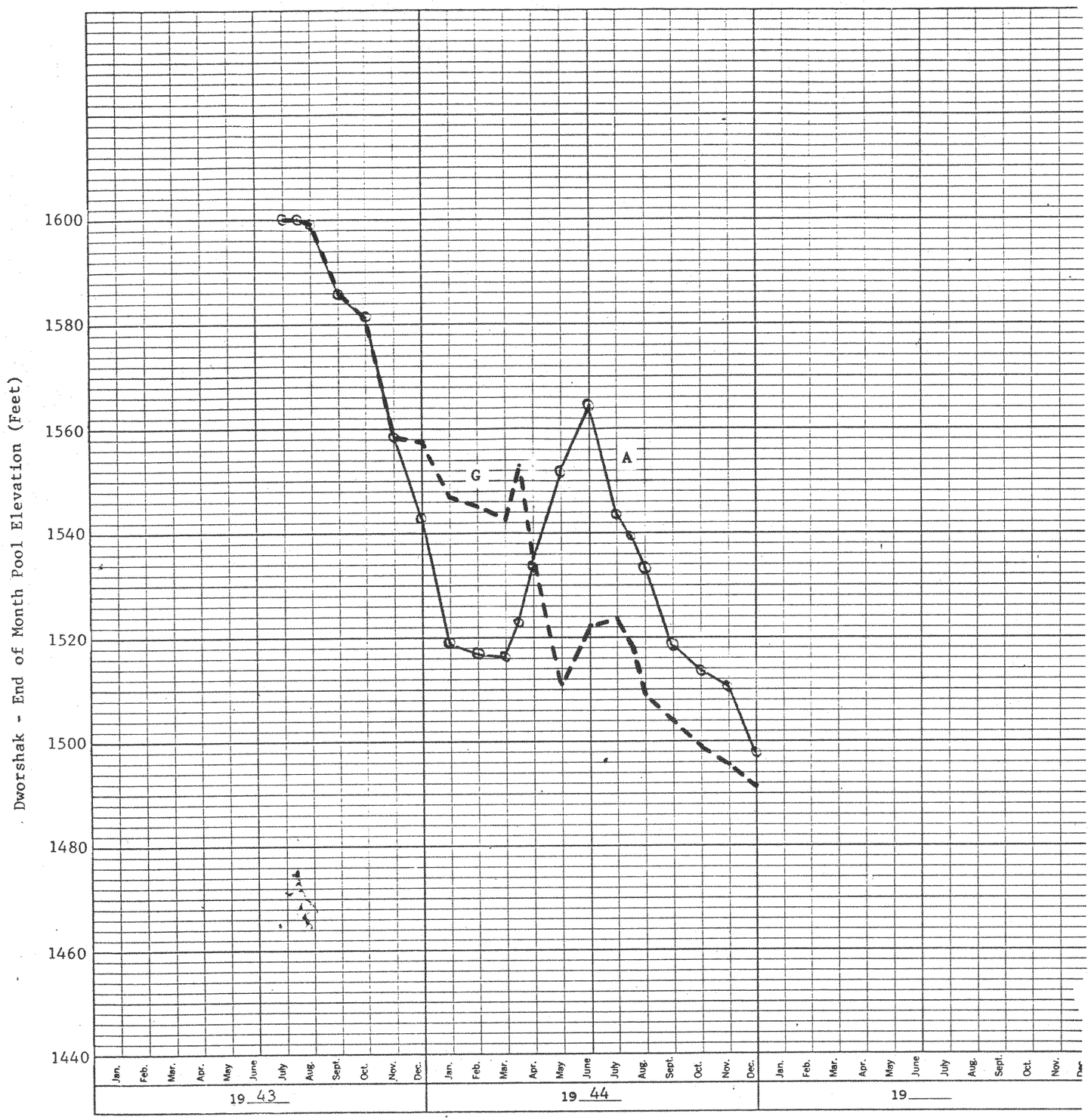
Representative Flow Years

High Year	**1965**		
Dworshak Inflow Volume (April through July)	3,305 MAF 1/		
Percent of Normal (1963 through 1977 base)	114		
Average Year	**1936**	**1958**	
Dworshak Inflow Volume (April through July)	3.085 MAF	2.774 MAF	
Percent of Normal (1963 through 1977 base)	107	96	
Low Year	**1944**	**1930**	**1931**
Dworshak Inflow Volume (April through July)	1.459 MAF	1.892 MAF	1.731 MAF
Percent of Normal (1963 through 1977 base)	51	66	60

1/ MAF = Million Acre-Feet

Graphs prepared by NPWPL-H

PLATE 52



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

(Study Data from NPDEN-WM-P)

Alternative G (CRITFC5)

Representative Flow Years

High Year	**1965**		
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Percent of Normal (1963 through 1977 base)	114		
Average Year	**1936**	**1958**	
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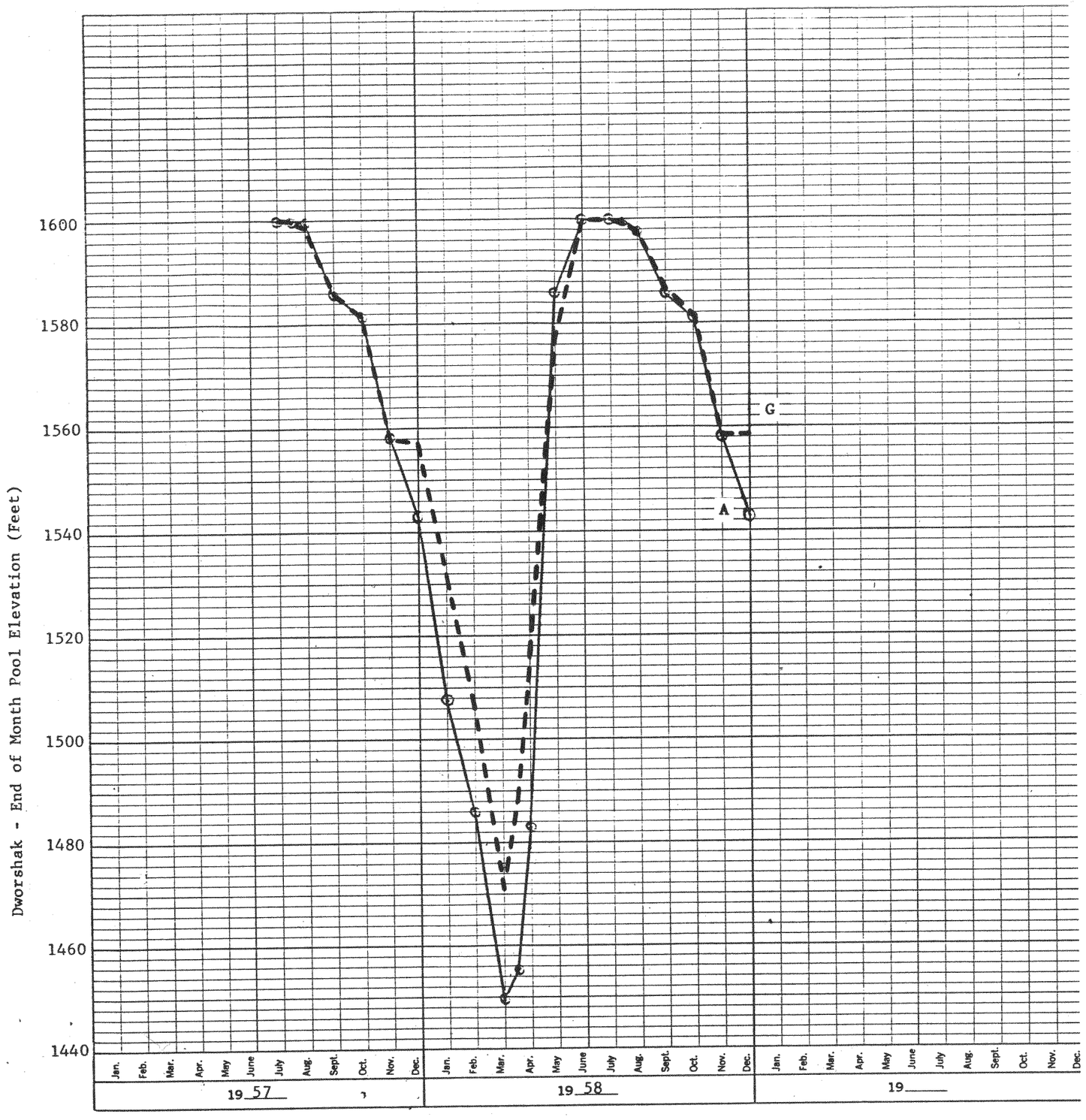
Percent of Normal (1963 through 1977 base)	51	66	60

1/ MAF = Million Acre-Feet

Graphs prepared by NPWPL-H

PLATE 53



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

(Study Data from NPDEN-WM-P)

Alternative G (CRITFC5)

Representative Flow Years

High Year	**1965**		
Dworshak Inflow Volume (April through July)	3.305 MAF 1/		
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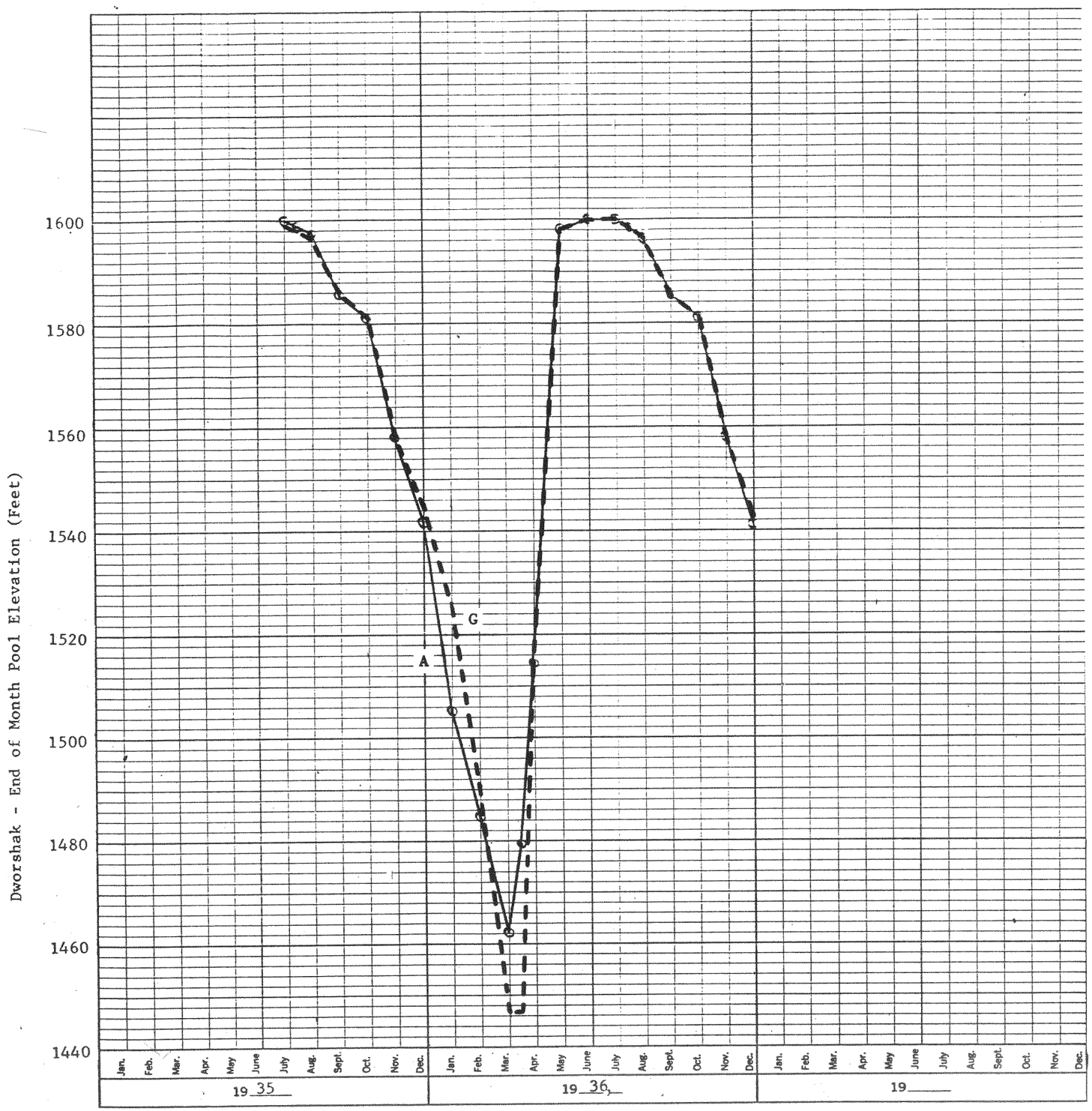
Graphs prepared by NPWPL-II

PLATE 54



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

(Study Data from NPDEN-W4-P)

Alternative G (CRITFC5)

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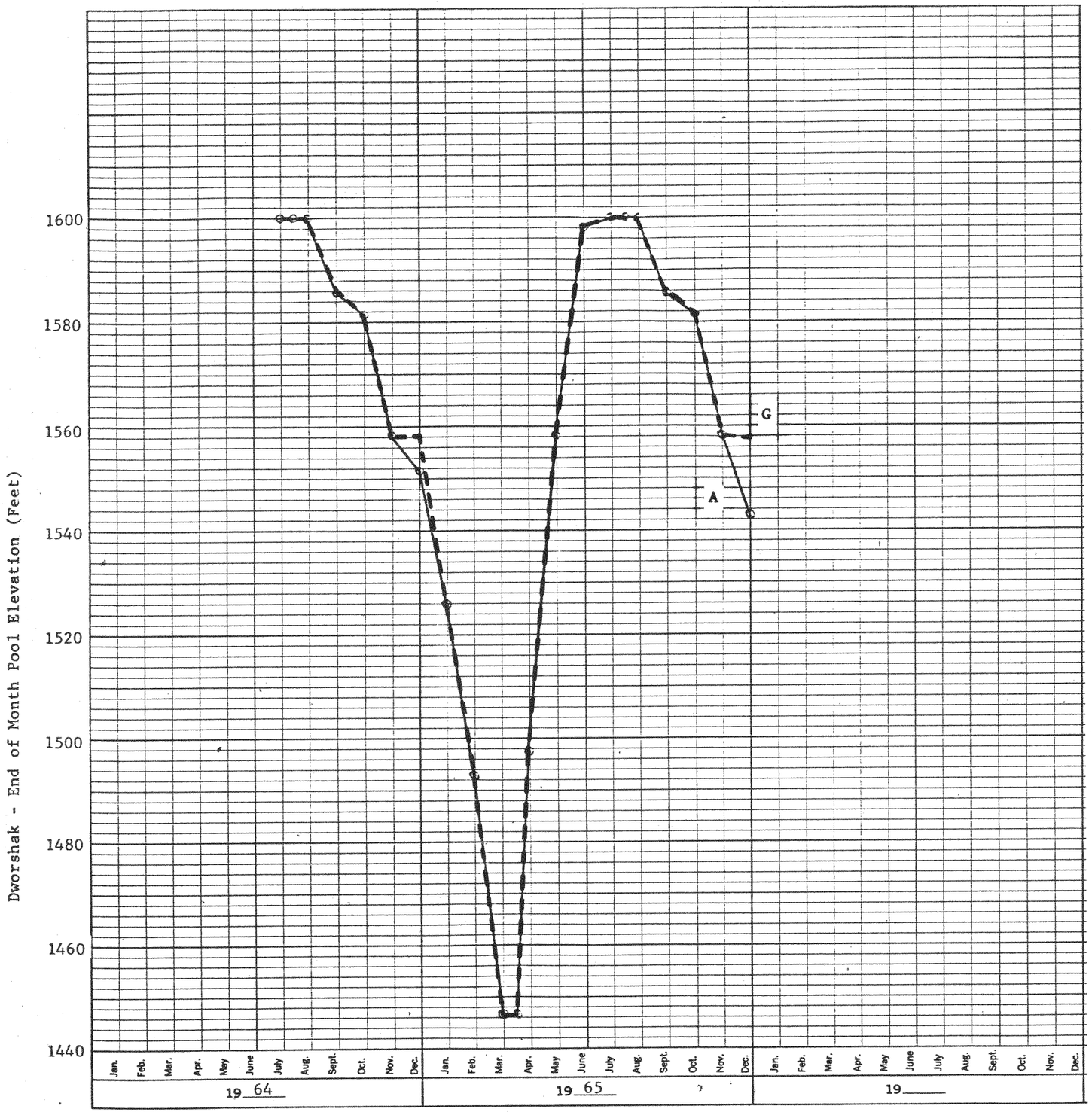
Graphs prepared by NPWPL-H

PLATE 55



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

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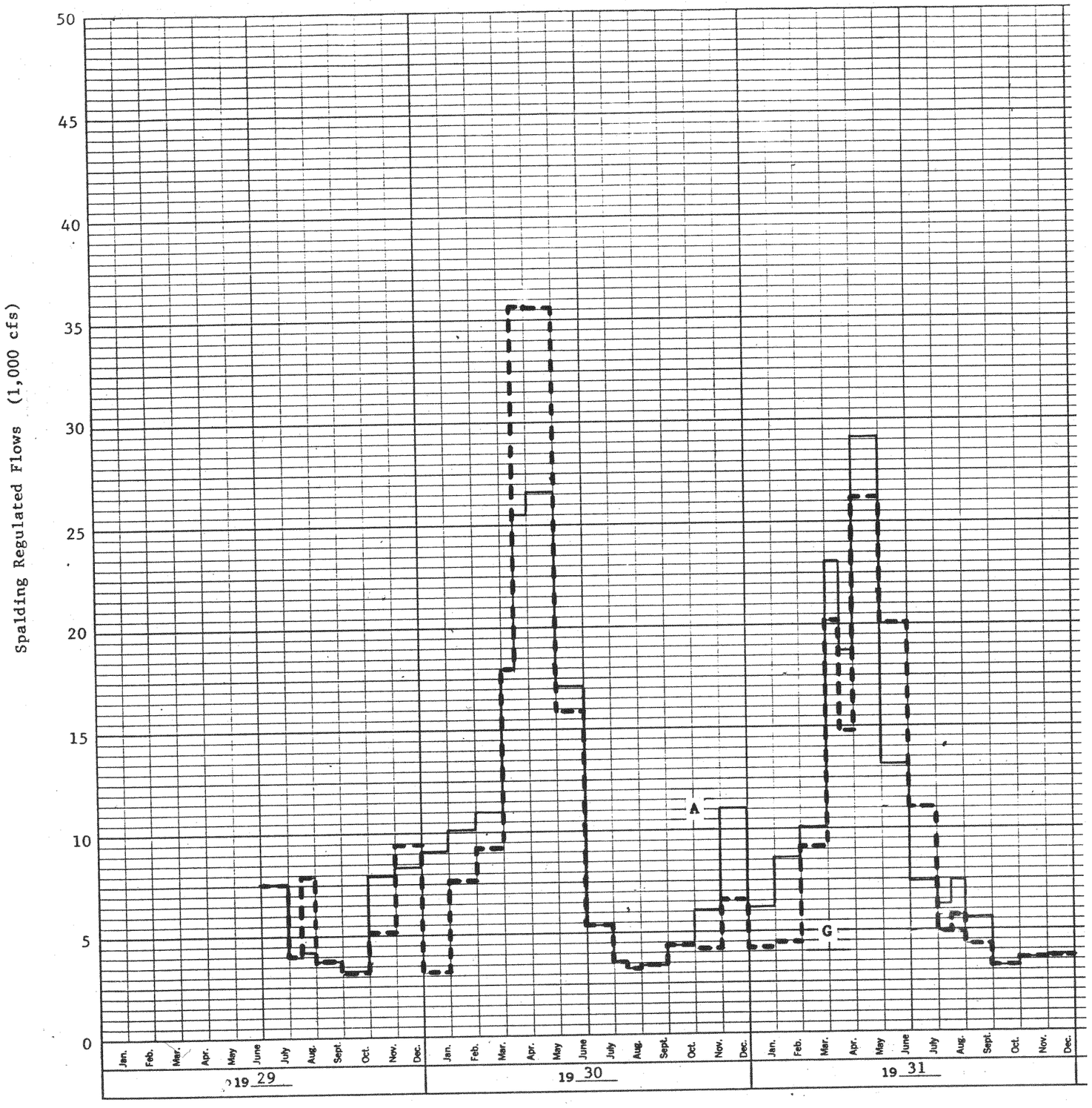
Graphs prepared by NWPL-H

PLATE 56



DWORSHAK WATER BUDGET MODEL STUDIES

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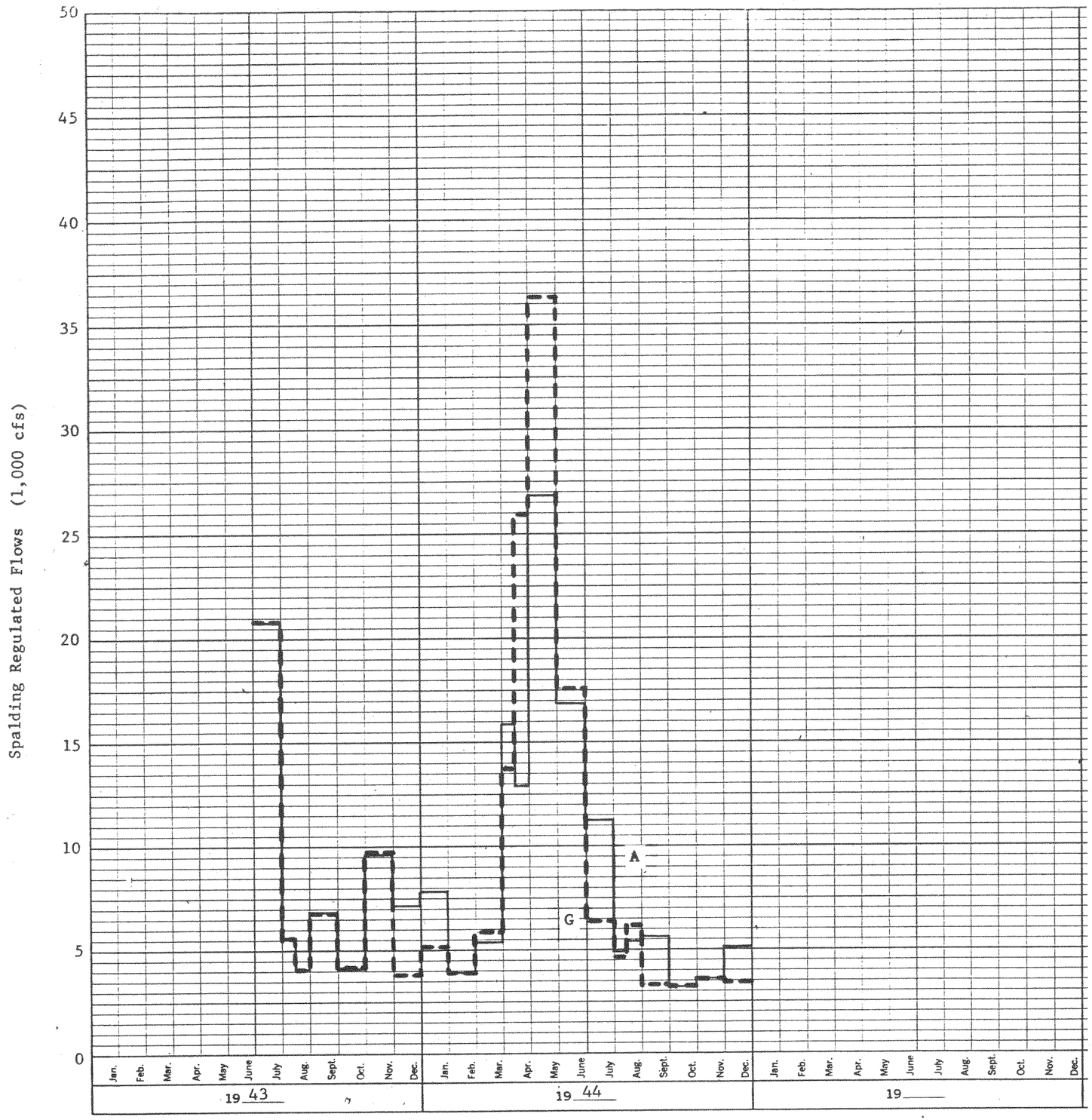
Graphs prepared by NPMPL-H

PLATE 57



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

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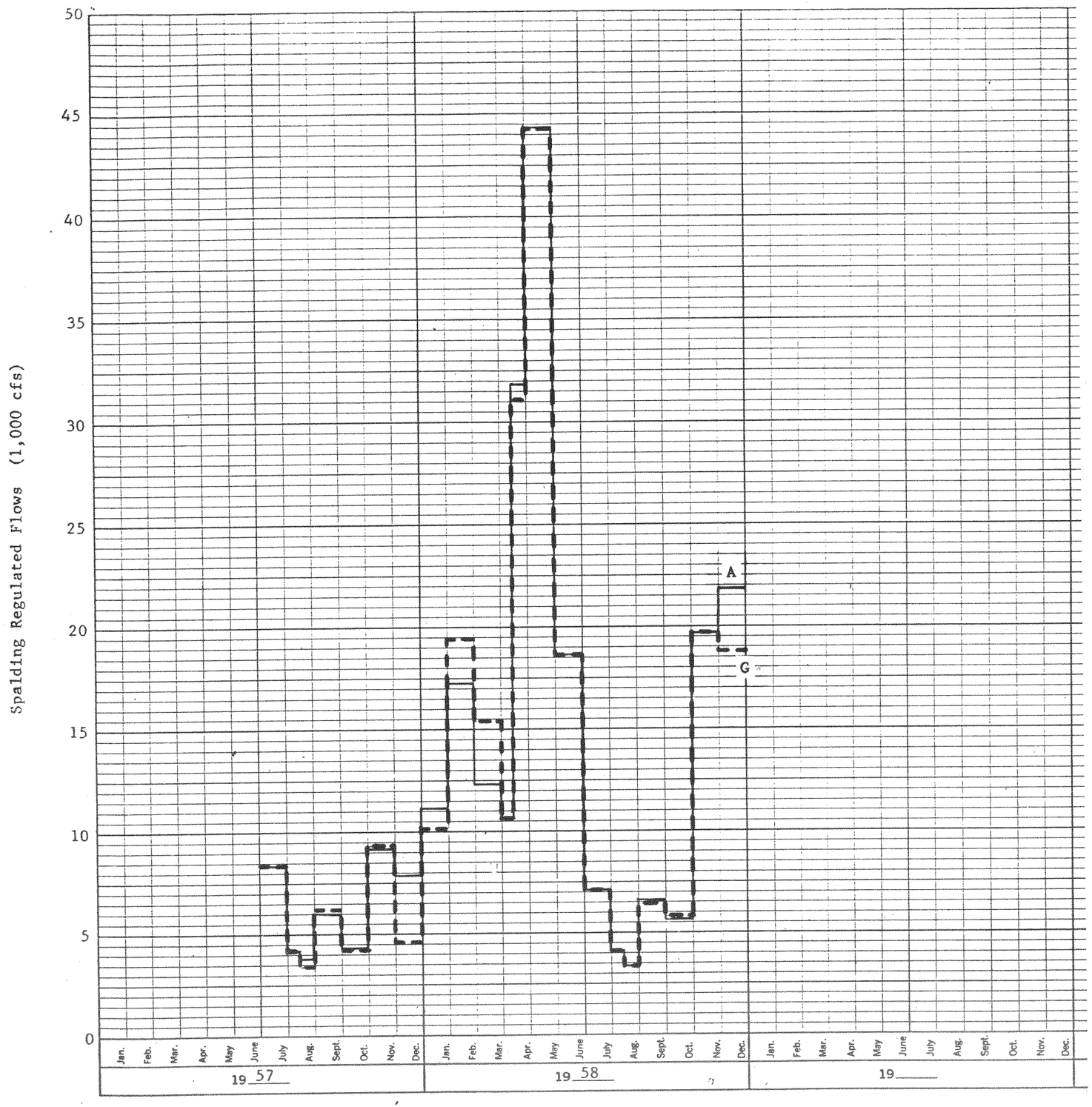
Graphs prepared by NPWPL-H

PLATE 58



DWORSHAK WATER BUDGET MODEL STUDIES

(FLOW IMPACTS TO MEET 85 KCFS AT LOWER GRANITE)

(Study Data from NPDEN-W4-P)

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PLATE 59

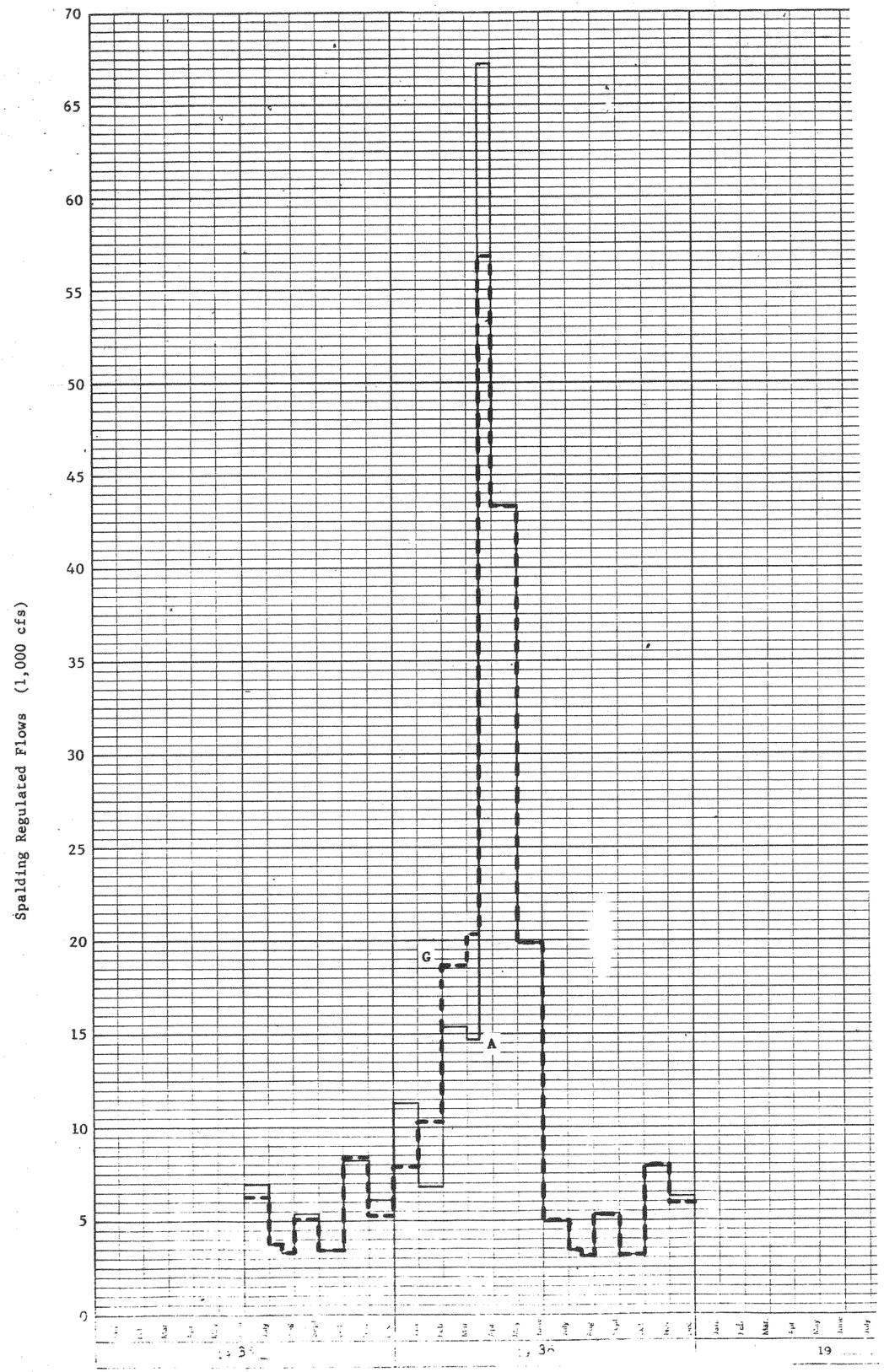

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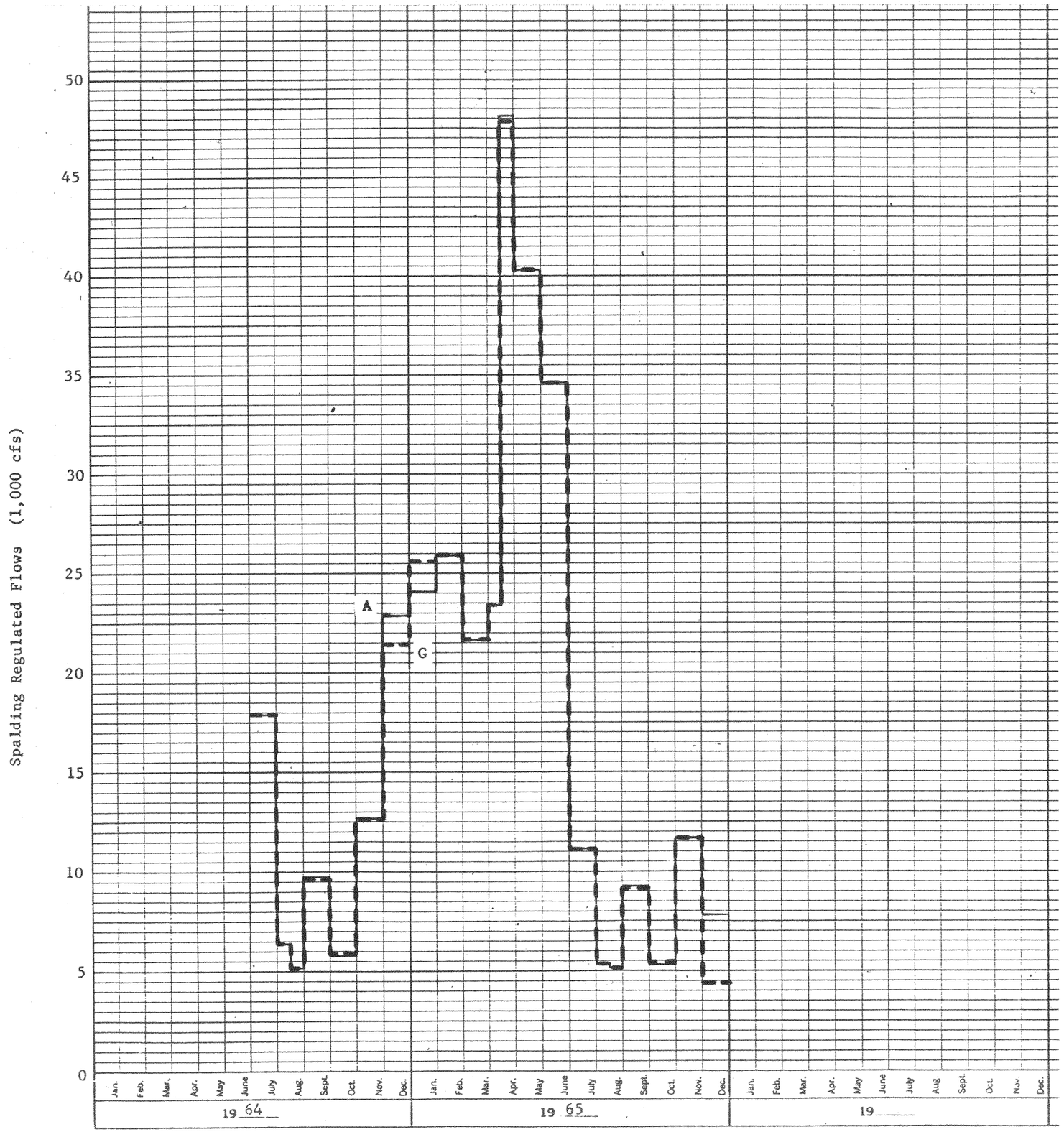
PLATE 60



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Graphs prepared by NWPL-H

PLATE 61

FINDINGS OF NO SIGNIFICANT IMPACT

Dworshak Dam and Reservoir

Water Budget Concept

As part of the NEPA process, an environmental assessment has been prepared for the Dworshak Dam and Reservoir contribution to the water budget for the Northwest Power Planning Council's fish and wildlife program. The intent of the water budget is that water stored in headwater reservoirs be released to improve juvenile anadromous fish migration to the Pacific Ocean. The water budget is that quantity of water in storage to provide flows equivalent to an average of at least 85 Kcfs at Lower Granite for 31 days during the period April 15 through June 15 during critical low flow years.

Important assumptions in the environmental assessment are that flood control criteria at Dworshak will not be violated and flows required to meet firm power will be released. The assessment does not address the impact from lost power generation nor the impacts created by flow requirements from Brownlee. The assessment is limited to Dworshak Reservoir impacts and impacts on Clearwater River downstream from Dworshak to the mouth.

The physical, biological, and cultural impacts have been studied for Alternative A (base condition), Alternative B (0.6 million acre-feet from Dworshak and the rest from Brownlee), Alternative C (0.9 million acre-feet from Dworshak and the rest from Brownlee), Alternative D (0.6 million acre-feet plus uncontained spill from Dworshak and the rest from Brownlee), Alternative E (Dworshak would provide the necessary flows), and Alternative F (Dworshak and Brownlee would provide proportional flows). Alternative G, proposed by the tribes, was also evaluated. This alternative goes beyond the water budget in requiring flows for 46 days instead of 31 days. It appears Alternatives C and D would support target flows in all years and B, E, and F in almost all years. Alternative G flow objectives are not attainable in approximately 20 percent of the years.

The implementation of the water budget alternatives creates impacts on reservoir recreation with a lesser impact on Clearwater River recreation. Reservoir recreation is increasingly impacted with the frequency of pool elevations below 1,595 feet msl and more severely impacted as pool drawdown levels increase. The use of the mini-campsites shows the greatest decline in use. There would be less recreational use in all categories.

The implementation of the water budget alternatives impacts log transportation at the reservoir. The increased frequency of pool level below 1,580 feet msl reduces the ability of logging companies to use the timber resources around Dworshak project.

The water budget increases flows in the Snake and Columbia Rivers which are expected to increase the number of anadromous fish that would return to the Clearwater River. Smallmouth bass that inhabit the reservoir may lose spawning areas and experience a population decline as a result of drawdown for lower pool levels. Wildlife changes would also occur as the result of the increased frequency of reservoir drawdown. The water budget alternatives would change wildlife habitat and slightly alter the Dworshak ecosystem.

I have weighed the beneficial and adverse environmental impacts of the proposed water budget alternatives on the nonpower operation of Dworshak Dam and Reservoir and have determined that implementing alternative A or B is a major Federal action which does not significantly affect the quality of the human environment. Implementing alternative C, D, E, F, or G is a major Federal action which may significantly affect the quality of the human environment and therefore requires further evaluation and the supplementing of the Dworshak Final Environmental Impact Statement.

Robert B. Williams
Colonel, Corps of Engineers
District Engineer

Date June 28, 1983

EQ 4-2-73

SEP 0 2 1983

~~August 31, 1983~~

PGC

Addressees

(Sgd.) JOHN B. PYRCH

John B. Pyrch
Environmental Coordinator - PGC

Responses to Water Budget EA Comments

Attached is a FINAL DRAFT copy of the Water Budget EA FONSI, errata sheet, the comments received, and our responses to those comments. Please review and provide your comments to Wally Hibbard by COB September 12, 1983.

Some editorial judgment was used in determining whether or not a comment warranted a response. This was particularly the case with PNUCC and the Northwestern School of Law where the numerous comments were sifted to find the underlying query. IS THIS APPROPRIATE? HAS THE BASIC ISSUE BEEN ADDRESSED? If you feel that any comment has been left unanswered, or the answer is lacking in detail, please note the comment and provide a handwritten response and/or addition.

Attachments

Addresses:
O. Schmidt - APG
M. Katz - AR
J. Mclennan - PG
J. Palensky - PJ
G. Fuqua - PR
L. Dean - PS
T. Morrell - SJ
G. Taylor - PL

WHibbard (WP-PGC-2206K)

cc
T. Cunningham - ALP
B. Lewis - AR
S. Price - PGC
D. Harper - PJI
B. MacKay - PRCA
D. Faulkner - PS
B. Freeland - SJ
Official File - PGC

U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

PROPOSED POWER SYSTEM CHANGES TO IMPLEMENT THE WATER BUDGET; FINDING OF NO SIGNIFICIANT IMPACT

DRAFT

AGENCY: Bonneville Power Administration (BPA), Department of Energy

ACTION: Finding of No Significant Impact (FONSI) on BPA's proposal to participate in implementation of the Water Budget measure of the Columbia River Basin Fish and Wildlife Program.

SUMMARY: The Columbia River Basin Fish and Wildlife Program was adopted in November 1982, by the Pacific Northwest Electric Power and Conservation Planning Council. The Water Budget measure of the Program is intended to meet the underlying need of improving the survival of juvenile salmon and steelhead migrating through reservoirs on the Columbia and Snake Rivers between April 15 and June 15 of each year. BPA has prepared, circulated for review, and considered an Environmental Assessment (EA) on its proposal to join with the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) in the decision to implement the Water Budget as a firm power planning constraint on the coordinated Federal Columbia River Power System (EA, page 3). The Corps and the Bureau are in the process of preparing appropriate environmental documentation regarding their participation in implementing the Water Budget.

Reasons why impacts are not signifcant::

1. The only clearly identifiable impacts of the proposal could result from the acquisition of new generating resources to replace flows previously used for the generation of firm energy which are now dedicated

to fish. However, there are sufficient existing generating resources within the region to adopt the Water Budget as a firm power planning constraint. Therefore, no new generating resources will need to be acquired in order for BPA to implement its portion of the Water Budget.(EA, page 41)

2. No air, land, or water quality impacts will occur at hydrogenerating projects within the region as a result of BPA's treating the Water Budget as a firm power planning constraint. Generating projects which are not on the mainstem Columbia River but are part of the Coordinated System will participate through coordinated system planning only to the degree that individual project constraints will allow (EA, page 30).

3. The impact to power marketing is the loss of the ability to market 510 MW of firm energy. The loss of 510 MW of firm energy creates an increase of 510 MW of secondary energy. BPA will compensate for lost revenues by increasing revenue requirements and rates (EA, page 43). The effects of increases attributable to the Water Budget are primarily socioeconomic in nature; there are no definitive physical effects (EA, pages vii, 44, and 49).

Notification of intent to prepare this EA was made by direct mailing to Federal, State, and local agencies and to affected and/or interested members of the public on February 24, 1983. The Notice of Intent was published in the Federal Register on February 17, 1983. The EA, with a notice of preliminary FONSI (EA, page 49) was distributed for review on May 20, 1983. The comment period for the EA and preliminary FONSI ended on June 24, 1983. Copies of this finding will be distributed, along with responses to comments recieved,

to those persons who received the EA. Copies are also available upon request from the Environmental Manager, Bonneville Power Administration, P.O. Box 3621 - SJ, Portland, Oregon 97208; telephone (503) 230-5136.

Based on the information in the EA, and after consideration of comments from the public and other agencies, the Department of Energy finds that the proposed action is not a major Federal action significantly affecting the quality of the human enviornment, within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, an environmental impact statement will not be prepared.

Issued in Washington, D.C., _____

WILLIAM A. VAUGHAN
Assistant Secretary
Environmental Protection, Safety,
and Emergency Preparedness

WHibbard:ay (WP-PGC-2132K)

ERRATA

1. Page V, Table S-1, number 1.a (right hand column) replace "Resource," with "Reduced."

2. Page vi, Table S-2, number 3.a (right hand colum) after "total", insert "space available for". Delete "space".

3. Page vii, Table S-3, type of Environmental Impact #3, should be changed to read:

   "Relatively small physical changes, therefore no significant impacts."

4. Page 1, paragraph 2, line 7, delete all of line 7 and insert

   "will improve conditions for instream migrants. The" (in response to comment #6).

5. Page 3, paragraph 5, line 4, insert the following after the word "alternative":

   ". . ., while it would at times provide optimum flows, . . ."(in response to comment #7).

6. Page 14, paragraph 1, line 5, delete all in parentheses (in response to comment #11).

7. Page 24, line 2, delete the word "generating" (in response to comment #13).

8. Page 27, paragraph 2, delete last three sentences and replace with the following:

   "Investigation of the 40-year record using seasonal hydroregulations with monthly averages of flows and generation indicated insignificant occurrences of peaking reductions for the Columbia and Snake River systems. Further analysis from an hourly standpoint showed that the continuous peaking ability of the Federal hydrosystem is very sensitive to the amount of energy generation and, hence, water releases from Federal reservoirs. This is particularly evident during normally low flow periods of the year such as August, September, and October. Reductions in firm load which cause the Federal system to approach minimum generation (as identified by minimum flow and electrical constraints) limit the ability to enter into peaking exchange arrangements. Too much return of energy during offpeak hours could cause Federal system load to fall below Federal system minimum generation requirements resulting in forced spill of water."

9. Page 28, section 4.5.2, paragraph 1, line 5; delete "any given year" and replace with ". . . the 40 years of record."

10. Page 31, section 4.6.4(b), delete the words "additional conservation" from lines 3 and 4. Acquisition of conservation has been detailed in a new subsection (d) of section 4.6.4 (in response to comments #5 and #74).

11. Page 31, section 4.6.4, add the following new section 4.6.4(d): (in response to comments #5 and #74).

    "d. Acquisition of CONSERVATION and implementation of conservation programs to enhance efficient use of electricity. Conservation actions include but are not limited to the following:

    1. Ensuring new residential and commercial facilities are energy efficient;
    2. installing energy efficient appliances;
    3. seeking more efficient means of manufacturing goods; and
    4. making existing structure more energy efficient."

12. Page 31, section 4.6.5, line 9, delete "reductions to" and insert ". . . modifications to the timing of . . ."

13. Page 36, first paragraph, last sentence, insert "nonfirm" after "increased" (two places in the sentence).

14. Page 37, Table 2, last line, change (-69,204,000) to (+69,204,000).

15. Page 39, section 5.2.1, first paragraph, delete last sentence, insert "The decrease is approximately 9% of the total space available for storage during the September 1 to April 15 period." (in response to comment #56)

16. Page 42, section 6.1.3, delete the first four lines and replace with the following:

    "Reductions in firm load during normally low flow periods may cause the Federal load to approach the generation required by the minimum flow. This condition can limit peaking exchange contracts in which energy is normally returned during offpeak hours. However, there are no physical changes anticipated to . . ."

17. Page 53, under Others/Individuals, add (in response to comment #26) "Committee (PNUCC)" to "Pacific Northwest Utilities Conference."

18. Page D-1, add the following definition to the glossary: (in response to comment #9)

"CONSERVATION - Any reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution."

19. Page D-3, delete glossary definition of the Pacific Northwest Utilities Conference Committee (PNUCC) and replace with the following: (in response to comment #27)

"A voluntary association of public and investor-owned electric utilities and BPA's direct service industries. Its primary responsibility is long-range planning of resources to meet forecasted electricity demand."

WHibbard:ay (WP-PGC-2203K)

EQ 4-2-13

PGC

SEP 0 2 1983

Mr. Doug James
Bureau of Reclamation
P.O. Box 043-550, West Fort Street
Boise, Idaho 97208

Dear Mr. James:

As agreed in our July 21, 1983, meeting, please find enclosed a draft copy of Bonneville Power Administration's (BPA) Water Budget Environmental Assessment (EA) errata sheet and a draft of BPA's responses to comments received on the EA. This package is presently undergoing internal review but should give you a pretty clear understanding of how we are dealing with comments received and revisions to the EA. Please let me know as soon as possible if you see any problems. A copy of the Finding of No Significant Impact will be sent to you once it has been drafted and cleared from the technical standpoint.

Sincerely,

(Sgd.) JOHN B. PYRCH

John B. Pyrch
Environmental Coordinator
Office of Power and Resources Management

Enclosure

WHibbard:wb (WP-PGC-2300K)

cc:
Official File - PGC

EQ4-2-13

PGC

SEP 02 1983

Mr. Art Gerlach
Corps of Engineers
P.O. Box 2870
Portland, Oregon 83724

Dear Mr. Gerlach:

As agreed in our July 21, 1983, meeting, please find enclosed a draft copy of Bonneville Power Administration's (BPA) Water Budget Environmental Assessment (EA) errata sheet and a draft of BPA's responses to comments received on the EA. This package is presently undergoing internal review but should give you a pretty clear understanding of how we are dealing with comments received and revisions to the EA. Please let me know as soon as possible if you see any problems. A copy of the Finding of No Significant Impact will be sent to you once it has been drafted and cleared from the technical standpoint.

Sincerely,

(Sgd.) JOHN B. PYRCH

John B. Pyrch
Environmental Coordinator
Office of Power and Resources Management

Enclosure

WHibbard:wb (WP-PGC-2300K)

cc:
Official File - PGC

EQ 4-2-13

SEP 0 2 1983

PGC

Anthony R. Morrell, Environmental Manager - SJ

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC (Sgd.) JOHN B. PYRCH

Transmittal of Draft Water Budget EA FONSI

Attached is a copy of the draft FONSI for the Proposed Power System Changes to Implement the Water Budget EA, the EA errata sheet, and responses to the comments received on the EA. Please forward this package to DOE for advance review and comment.

We would appreciate any comments from DOE by September 12, 1983. This will allow us to integrate their concerns with the BPA comments in a timely manner and distribute this package to the public by the end of September.

Attachments

SPrice:sp (2304K)

cc:
O. Schmidt - APG
W. Hibbard - PGC
D. Harper - PJI
B. MacKay - PRCA
D. Faulkner - PS
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

EQ 4-203 file

BPA

UNITED STATES GOVERNMENT

Memorandum

DATE : August 17, 1983

In reply refer to : SJ

TO : Wallace A. Hibbard
Environmental Specialist - PGC

FROM : William A. Freeland
Environmental Specialist - SJ

SUBJECT: Responses to Water Budget EA Comments

Attached are my handwritten comments on the above subject. I have two general concerns:

First, many of the comments/responses could be evaluated together, i.e. similar comments placed together and one general response covering the topic would be developed. For example, comments on the BPA NEPA process could be brought together and answered. Thirty-three out of 72 responses refer to another response. This indicates many individuals raising similar issues. Individual responses disquise the frequency that an issue is raised and the category of commentors who raise it. This is a valuable piece of information for our decisionmakers.

Second, BPA and the Office of Power and Resources Management in particular, has not developed an overall strategy to evaluate issues and concerns in a coordinated process that is evident to the general public. Our decisions seem to be made piece-meal (with NEPA as only a small portion of the overall program). All too often, our response to outside comments is "a change in circumstances will require further NEPA review and analysis," or that the issue will be raised in another document. This occurs eleven times in these responses. To be informed, the general public must know when and where these issues are addressed. It is our duty to be responsive to this need to the best of our ability.

I urge you to consider these two points before finalizing the responses. Thank you for the opportunity to review your material.

Attachment

WFreeland:mem (WP-SJ-23530)

cc:
J. Pyrch - PGC
A. Morrell - SJ
Official File - SJ

AUG 1 2 1983

PGC

EQ 4-2
Water Budget

Addressees

Wallace Hibbard
Environmental Specialist - PGC

Responses to Water Budget EA Comments

Attached is a copy of the Water Budget EA errata sheet, the comments received, and our draft responses to those comments. Please review and comment to me by COB August 22, 1983.

Please pay particular attention to the following:

Technical completeness of each response.
Is there a response for each comment?
When other responses are referenced, is the reference correct?
Are the references to the errata sheet correct?
Are the errata citations to the responses correct?

Some editorial judgment was used in determining whether or not a comment warranted a response. If you feel that any comment has been left unanswered, or the answer is lacking in detail, please, if you have the information available, note the comment and provide a handwritten response and/or addition.

The EA FONSI is presently being drafted. It will be circulated when available.

Attachments

Addresses:
T. Cunningham - ALP
O. Schmidt - APG
J. Pyrch - PGC
S. Price - PGC
D. Harper - PJI
B. MacKay - PRCA
D. Faulkner - PS
B. Freeland - SJ

WHibbard (WP-PGC-2206K)

cc:
Official File - PGC

ADMINISTRATOR'S BRIEFING PAPER
7-22-83

Water Budget

CONTEXT

BPA believes that BPA committed to the Water Budget as a firm constraint on the system, for 1983-84, when we made our February 1, 1983, submittal under the Coordination Agreement, and for OY 1983-84 and OY 1984-85, when we included meeting the Water Budget in the hydroregulation for the 1983 rate case.

The Corps apparently believes that it will make the decision for OY 1983-84 in September 1983, when the General signs off on the Coordinated Regulation. (Corps and BPA operational and legal staff have disagreed historically on this point.)

At the last meeting between Bill Lloyd (Bureau), General van Loben Sels (Corps), and you (BPA), on March 9, 1983, it was agreed to meet again after BPA received comments on its EA. We had a staff level meeting to discuss the comments and our EA/FONSI strategy on July 21, 1983, and successfully resolved all issues such that we do not see any need for a higher level meeting.

STATUS

BPA Water Budget EA on power effects, released to the public on May 20, 1983 for comment by June 24, 1983, treats the Water Budget as a firm planning constraint that will not need to be re-evaluated each year. BPA expects to FONSI its participation pursuant to this document by mid-September (schedule attached).

Corps Water Budget EA's - The Corps has finalized and is holding for release, EA's for their Libby and Dworshak facilities participating in the Water Budget for OY 1984. The EA's will most likely be released after the Corps has had opportunity to review BPA's draft FONSI and response to comments to insure compatibility between BPA and Corps documents. Release scheduled in September just prior to General signing Coordinated Regulation. The EA/FONSI on Dworshak is based on operating to insure refill which happens to coincide with generation capacity (10,000 cfs).

BPA and IPC have initiated the environmental investigation of non-power effects of IPC providing Snake River water from Brownlee Reservoir. CH2M Hill is the firm contracting to do the study which is funded by BPA. Scoping meetings were held in E. Oregon and W. Idaho during the week of June 12. BPA anticipates preparing an EA/FONSI next winter for a power replacement agreement with IPC for Water Budget participation OY 1984 and beyond. IPC does not view the environmental investigation as a means of determining level of participation.

The Corps and the IPC continue to be at odds as to degree of participation from their facilities for the Snake system. With the minimum Corps participation at Dworshak, and limited participation by IPC, the likelihood of meeting the Water Budget on the Snake will be reduced.

The Water Budget Managers petitioned BPA to not fund the environmental investigation of nonpower impacts to IPC's Hells Canyon complex until Corps and IPC have settled the conflict over degree of participaion (letter attached). Water Budget Managers fear funding of study limiting Brownlee drawdown to elevation 2,036 (IPC's self-imposed limit) rather than to 2,008 (a level that will assure adequate Snake River flows) implies that BPA endorses 2,036. BPA staff response will indicate that the study will continue as it represents the first step of an important information gathering process that IPC will use in their determination of degree of participation. The information will also be used by BPA for NEPA purposes if IPC and BPA enter into a replacement agreement.

Bureau of Reclamation has placed draw-down limits on Grand Coulee of 1,240 feet at end of May. They will, in their FONSI, state that with that limit, no change in operations is needed. They intend to rely on the BPA and Corps EA's and Council program as support for NEPA compliance. The 1,240 limitation may reduce the likelihood that the Water Budget will be met on the mainstem.

(WP-PGC-2013K)

Office of Power and Resource Management
Bonneville Power Administration

REVISED SCHEDULE FOR SYSTEMWIDE POWER IMPACTS EA

ACTIVITY	COMPLETION DATE
Notice of Intent (Federal Register)	2/17/83 +
Mailing to Coordination Group*	2/25/83 +
Develop Final Mailing List	3/29/83 +
Preliminary Draft to DOE	4/4/83 +
Advance Copy to ACOE, B.R., NMFS, FWS, Council staff and key BPA staff	4/21/83 +
Formal Transmittal to DOE	5/11/83 +
Publish and Distribute	5/20/83 +
Agency and Public Information Meeting (room 464 1-4pm)	6/2/83 +
Close of Comment Period	6/24/83 +
Internal review of comments and draft responses due to PGC	7/15/83
Draft responses to comments out for BPA review	7/25/83
Close of BPA internal review	8/15/83
Advance FONSI, EA errata sheet and response to comments to DOE	8/26/83
Formal Transmittal to DOE	8/31/83
Publish and Distribute FONSI	9/16/83

\+ Indicates activity completed.

* Includes Consultation/Coordination, Water Budget, NMFS, FWS, CORPS, BUREAU, and interested citizens mailing lists.

1815K 5-31-83 (revised 7/10/83)

WATER BUDGET CENTER
2705 E. BURNSIDE
SUITE 213
PORTLAND, OR 97214

June 29, 1983

Mr. John Pyrch
Environmental Coordinator
Office of Power and Resources Management - PGE
Bonneville Power Administration
POB 3621
Portland, OR 97212

Dear Mr. Pyrch:

Utilization of the Snake River water budget allocation as intended by the Northwest Power Planning Council Fish and Wildlife Program requires resolution of the degree of participation by both Dworshak and Brownlee reservoirs.

The present position of the Corps is that Dworshak outflow during the water budget period should not exceed the hydraulic capacity of 10,000 cfs. Idaho Power Company presently has taken the position that Brownlee drawdown will be limited to elevation 2036, or less if it is a dry year.

According to our calculations, based upon computer regulations made by the CoE, these limitations would result in flows less than 85,000 cfs at Lower Granite Dam in 6 out of 40 years, or at 15 percent probability of occurrence. This is not consistent with the Fish and Wildlife Program.

The water budget concept was adopted to provide the water in low runoff years necessary to reduce or eliminate smolt losses. The water budget managers, therefore, speaking for the fish and wildlife agencies and tribes, believe that participation by both Dworshak and Brownlee reservoirs must be at the combined level necessary to provide the water budget volume specified in the NPPC Fish and Wildlife Program. Limiting the participation to the respective levels presently suggested by the Corps and Idaho Power Company will defeat the NPPC's intent in adopting the water budget by making it impossible to provide the needed improvement in downstream passage conditions during low runoff years.

We therefore recommend that BPA not conduct the environmental investigation referred to in your June 7, 1983 information bulletin until such time as Idaho Power Company and the CoE agree on a joint participation arrangement that will meet the water budget. The necessary participation likely would require larger releases from Dworshak combined with a lower drawdown level at Brownlee. To proceed with the investigation without resolution of this question would imply approval of the present CoE and Idaho Power Company positions.

Sincerely,

Mark W Maher

Mark Maher
Water Budget Manager
Fish and Wildlife Agencies

Malcolm H Karr

Malcolm H. Karr
Water Budget Manager
Columbia Basin Tribes

cc: NPPC - Curt Marshall
CoE - Nick Dodge
Idaho Power Company - Don Barclay
CBF&W Council - Kahler Martinson
CRITFC - S. Timothy Wapato
Columbia Basin Tribes

MM:MK:ajb

89 4-2-13

JUL 2 0 1983

PGC

(Sgd.) JOHN B. PYRCH

_____
_____
_____

Dear _____:

Thank you for your letter of comment regarding Bonneville Power Administration's Environmental Assessment (EA) on proposed power system changes to implement the Water Budget. Your comments are part of the official record and will be taken into consideration.

You will receive all future information regarding the disposition of the EA.

Sincerely,

(Sgd.) JOHN B. PYRCH

John B. Pyrch
Environmental Coordinator
Office of Power and Resources Management

WHibbard:dg (WP-PGC-2152K)

cc
W. Hibbard - PGC
S. Price - PGC
Official File - PGC

Mr. Randall W. Hardy
Executive Director
Pacific Northwest Utilities
Conference Committee
520 SW. Sixth Avenue, Suite 505
Portland, Oregon 97204

Mr. Lawrence R. Anderson
Director
Office of Electric Power Regulations
Federal Energy Regulatory Commission
Washington, D.C. 20426

Mr. David W. Heiser
Chief, Environmental Coordination
State of Washington
Parks and Recreation Commission
7150 Clearwater Lane, KY-11
Olympia, Washington 98504

Mr. Michael C. Blumm
Associate Professor of Law
Lewis and Clark College
Northwest School of Law
Portland, Oregon 97219

Mr. Merle R. Gibbens
Secretary-Manager
South Columbia Basin Irrigation District
402 West Lewis Street
Pasco, Washington 99301

Mr. T. Allan Comp
Acting Associate Regional Director
Recreation Resource and Professional Services
National Park Service
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2001 Sixth Avenue
Seattle, Washington 98121

Mr. Robert L. Henny
Assistant Chief, Planning Division
North Pacific Division
U. S. Army Corps of Engineers
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Portland, Oregon 97208

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Libby, Montana 59923

Mr. Gary Fritz
Administrator
State of Montana
Department of Natural Resources
and Conservation
Water Resources Division
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Helena, Montana 59620

Mr. Patrick J. Graham
Bureau Chief
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P.O. Box 67
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Mr. Carl A. Barr
Director of Power Production
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Mr. Fred A. Shiosaki
Manager, Environmetal Affairs
The Washington Water Power Company
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Spokane, Washington 99220

Ms. Katherine Fletcher
Director, Environmental Affairs Division
Seattle City Light
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Seattle, Washington 98104

Mr. Brett Wilcox
Executive Director
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Portland, Oregon 97219

Mr. Roger Purdom
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Public Utility District No. 1
of Chelan County
P.O. Box 1231
Wenatchee, Washington 98801

Mr. Douglas J. James
Acting Regional Environmental Officer
Bureau of Reclamation
Pacific NW. Region
P.O. Box 043-550, West Fort Street
Boise, Idaho 83724

JUL 2 0 1983

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: PGC

JUL 2 0 1983

_____
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Acting Regional Environmental Officer
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P.O. Box 043-550, West Fort Street
Boise, Idaho 83724

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon 97310
Phone: 378-3732

RECEIVED
JUN 13 1983
OSDA-DIVISION OF SOIL AND WATER CONSERVATION

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: JUL 08 1983

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

JUL 20 1983

PROGRAM REVIEW AND COMMENT

TO STATE CLEARINGHOUSE: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

(✓) It has Adverse effects. (Explain in Remarks Section)

( ) We are interested but require more information to evaluate the proposal. (Explain in Remarks Section)

( ) Additional comments for project improvement. (Attach if necessary)

REMARKS (Please type or print legibly)

The Oregon Department of Agriculture supports efforts of agencies improving Oregon's fisheries resource.

However, the proposed "POWER SYSTEM CHANGES TO IMPLEMENT THE WATER BUDGET" project will adversely affect Oregon's irrigators if its estimated increase in power rates occurs. In many cases today, the cost of production on irrigated land already exceeds the income obtainable from that land. Irrigation power rates have increased as much as 600% over the past 10 years in Oregon, causing farmers to take irrigated land out of production or revert to dryland farming. Oregon's irrigators can't afford additional reductions in irrigated acres or, additional increases in power rates.

This project conflicts with the recent request by Oregon irrigators (supported by the Oregon Dept. of Agriculture) to Bonneville Power Administration for a long-term, seasonal, off-peak rate for irrigation

Agency Ag Administration By [illegible]

70. Response: The Governor of Oregon has stated that this concern is mitigated through the negligible rate increase to irrigators (see comment number 69).

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon 97310
Phone: 378-3732

RECEIVED
JUN 13 1983
Dept. of Energy

PNRS STATE REVIEW

Project #: OR 050531-005-4 Return Date: JUL 08 1983

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REMARKS (Please type or print legibly)

Agency [illegible] By [illegible]

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon 97310
Phone: 378-3732

Management Services Div.
Dept. of Environmental Quality
RECEIVED
JUN 15 1983
JUN 30

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: JUL 08 1983

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REMARKS (Please type or print legibly)

Glen Carter
Salem

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

JUN 16 1983

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon 97310
Phone: 378-3732

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: JUL 08 1983

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By Lands By [illegible]

OREGON PROJECT NOTIFICATION

ATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon
Phone: 378-3732 97310

INTERGOVERNMENTAL RELATIONS DIVISION
JUN 16 1983

PNRS STATE REVIEW

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REMARKS (Please type or print legibly)

gency Forestry By Roger Miller

Phone Number

OREGON PROJECT

STA

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon
Phone: 378-3732 97310

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: JUL 08 1983

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Agency _____ By _____

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon
Phone: 378-3732 97310

JUL 01 1983

DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT

JUN 13 1983

SALEM
JUL 08 1983

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: _____

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REMARKS (Please type or print legibly)

Agency LCDC By Richard L. Mathews

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage ST NE Salem, Oregon
Phone: 378-3732 97310

RECEIVED
JUN 16 1983
WATER RESOURCES DEPT.
SALEM, OREGON

PNRS STATE REVIEW

Project #: OR 830531-005-4 Return Date: JUL 08 1983

Bonneville Power Adm.

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REMARKS (Please type or print legibly)

Agency _____ By _____

11/83

U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Proposed Power System Changes
To Implement The Water Budget;
Finding Of No Significant Impact

AGENCY: Bonneville Power Administration (BPA), DOE.
ACTION: Finding of No Significant Impact (FONSI) on BPA's proposal to participate in implementation of the Water Budget measure of the Columbia River Basin Fish and Wildlife Program.
SUMMARY: The Columbia River Basin Fish and Wildlife Program was adopted in November 1982 by the Pacific Northwest Electric Power and Conservation Planning Council. The Water Budget measure of the Program is intended to meet the underlying need of improving the survival of juvenile salmon and steelhead migrating through reservoirs on the Columbia and Snake Rivers between April 15 and June 15 of each year. BPA has prepared, circulated for review, and considered an Environmental Assessment (DOE/EA-0214) on its proposal to join with the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) in the decision to implement the Water Budget as a firm power planning constraint on the coordinated Federal Columbia River Power System (EA, page 3). The Corps and the Bureau are in the process of preparing appropriate environmental documentation regarding their participation in implementing the Water Budget.

Reasons why power system changes are not significant:

(1) Implementation of the Water Budget creates a firm power planning constraint. The only clearly identifiable impact of the proposal results if additional generating resources would have to be acquired to replace generation previously obtained from flows which are now dedicated to fish. However, the region's current energy surplus allows for derating the system without requiring the acquisition of additional resources (EA, page 41). NEPA analysis on any future acquisition of additional resources will take place at the time the acquisition is proposed.

(2) Because BPA's action is a power planning function, BPA's treatment of the Water Budget as a firm power planning constraint results in no air, land, or water quality impacts at hydrogenerating projects within the region. Generating projects which are not on the mainstem Columbia River but are part of the Coordinated System will participate through coordinated system planning only to the degree that individual project constraints will allow (EA, page 30).

(3) The impact to power marketing is a reduction in firm energy availability of 510 MW, and increased and reshaped secondary energy production. BPA will compensate for any lost revenue by increasing rates (EA, page 43). The effects of rate increases attributable to the Water Budget are primarily socioeconomic in nature; there are no definitive physical effects (EA, pages vii, 44, and 49).

Notification of intent to prepare this EA was published in the Federal Register on February 17, 1983, and was mailed to Federal, State, and local agencies and to affected and/or interested members of the public on February 24, 1983. The EA, with a notice of preliminary FONSI (EA, page 49) was distributed for review on May 20, 1983. The

comment period for the EA and preliminary FONSI ended on June 24, 1983. Copies of this finding will be distributed, along with responses to comments received, and errata to the EA, to those persons who received the EA.

FOR FURTHER INFORMATION CONTACT: Copies are also available upon request from the Environmental Manager, Bonneville Power Administration, P.O. Box 3621 - SJ, Portland, Oregon 97208; telephone (503) 230-5136.

Based on the information outlined above, the Department of Energy finds that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, an environmental impact statement will not be prepared.

Issued in Washington, D.C., November 15, 1983.

/sgd/ William A. Vaughan

WILLIAM A. VAUGHAN
Assistant Secretary
Environmental Protection, Safety,
and Emergency Preparedness

U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

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WILLIAM A. VAUGHAN
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U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

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To Implement The Water Budget;
Finding Of No Significant Impact

AGENCY: Bonneville Power Administration (BPA), DOE.
ACTION: Finding of No Significant Impact (FONSI) on BPA's proposal to participate in implementation of the Water Budget measure of the Columbia River Basin Fish and Wildlife Program.
SUMMARY: The Columbia River Basin Fish and Wildlife Program was adopted in November 1982 by the Pacific Northwest Electric Power and Conservation Planning Council. The Water Budget measure of the Program is intended to meet the underlying need of improving the survival of juvenile salmon and steelhead migrating through reservoirs on the Columbia and Snake Rivers between April 15 and June 15 of each year. BPA has prepared, circulated for review, and considered an Environmental Assessment (DOE/EA-0214) on its proposal to join with the Corps of Engineers (Corps) and the Bureau of Reclamation (Bureau) in the decision to implement the Water Budget as a firm power planning constraint on the coordinated Federal Columbia River Power System (EA, page 3). The Corps and the Bureau are in the process of preparing appropriate environmental documentation regarding their participation in implementing the Water Budget.

Reasons why power system changes are not significant:

(1) Implementation of the Water Budget creates a firm power planning constraint. The only clearly identifiable impact of the proposal results if additional generating resources would have to be acquired to replace generation previously obtained from flows which are now dedicated to fish. However, the region's current energy surplus allows for derating the system without requiring the acquisition of additional resources (EA, page 41). NEPA analysis on any future acquisition of additional resources will take place at the time the acquisition is proposed.

(2) Because BPA's action is a power planning function, BPA's treatment of the Water Budget as a firm power planning constraint results in no air, land, or water quality impacts at hydrogenerating projects within the region. Generating projects which are not on the mainstem Columbia River but are part of the Coordinated System will participate through coordinated system planning only to the degree that individual project constraints will allow (EA, page 30).

(3) The impact to power marketing is a reduction in firm energy availability of 510 MW, and increased and reshaped secondary energy production. BPA will compensate for any lost revenue by increasing rates (EA, page 43). The effects of rate increases attributable to the Water Budget are primarily socioeconomic in nature; there are no definitive physical effects (EA, pages vii, 44, and 49).

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Based on the information outlined above, the Department of Energy finds that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, an environmental impact statement will not be prepared.

Issued in Washington, D.C., November 15, 1983.

/sgd/ William A. Vaughan

WILLIAM A. VAUGHAN
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Environmental Protection, Safety,
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U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Proposed Power System Changes
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Finding Of No Significant Impact

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Issued in Washington, D.C., November 15, 1983.

/sgd/ William A. Vaughan

WILLIAM A. VAUGHAN
Assistant Secretary
Environmental Protection, Safety,
and Emergency Preparedness

U.S. DEPARTMENT OF ENERGY

Bonneville Power Administration

Proposed Power System Changes
To Implement The Water Budget;
Finding Of No Significant Impact

AGENCY: Bonneville Power Administration (BPA), DOE.
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WHibbard/SPrice:sp (WP-PGC-2407K)

cc:
J. Robertson - AL
D. L. Geiger - ALP
T. Cunningham - ALP
O. Schmidt - APG
O. W. Halvorson - APG
J. Luce - APP
M. B. Katz - AR
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District Managers - OKK,
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Environmental Protection, Safety,
and Emergency Preparedness

Hibbard

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

July 1, 1983

Planning Branch

Dear Recipient:

Attached for your information is the finding of no significant impact (FONSI) and final environmental assessment entitled, "Environmental Impacts Caused by Libby Dam-Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Power Planning Council." The draft report was transmitted for public review on 19 November 1982. Comments received during the reviewing period and the Corps of Engineers' responses to the comments are contained in this report.

Questions regarding the FONSI and the final environmental assessment may be addressed to Jack Thompson, Environmental Coordinator, at telephone (206) 764-3625 or FTS 399-3625.

Sincerely,

NORMAN C. HINTZ
Colonel, Corps of Engineers
District Engineer

Enclosure

NPSEN-PL-ER

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL IMPACTS CAUSED BY LIBBY DAM-LAKE KOOCANUSA
PROJECT RELEASING WATER BUDGET FLOWS RECOMMENDED
BY THE NORTHWEST POWER PLANNING COUNCIL

1. The Corps of Engineers, Seattle District, has prepared an environmental assessment (EA) regarding the nonpower environmental impacts caused by Libby project particpating in the "Water Budget" flows proposed by the Pacific Northwest Electric Power Planning and Conservation Council for 1984. The EA was prepared in response to the Council's request for possible implementation of one of the elements of the Council's fish and wildlife program which was adopted on 15 November 1982.

The purpose of the Water Budget is to provide fish transportation flows in the mid-Columbia and Snake Rivers to improve the survival of juvenile salmon and steelhead as they migrate seaward past the dams during the spring months. To accomplish this purpose, the Corps of Engineers, in cooperation with other agencies, investigated a number of alternatives and determined that additional water must be supplied by the water storage projects in the upper watersheds. Libby project would be one of the reservoirs affected by supplying flows to the Columbia River.

The changes of reservoir elevation and flow releases at Libby project to meet the Water Budget were compared to the existing operational methods. No significant impacts on the resident fishery or the biological productivity of the reservoir or the river downstream were found. Our assessment indicates there are no significant impacts to wildlife, including the bald eagle, an endangered species. Water quality will remain unchanged. Cultural resources will not be impacted. Recreation in the reservoir and the river below Libby Dam will not be affected significantly and there are no impacts on flood control or other nonpower purposes of the project.

2. The preliminary finding of no significant impact and the EA has been distributed to the public, interested governmental agencies, and Indian tribes for comment. Our response to these comments has been included with the EA.

A number of the respondents were understandably concerned that the EA does not consider the larger, direct, indirect, cumulative, system-wide power and nonpower impacts they perceived to be inherent in achieving a regional goal. It is recognized that the Libby project EA is but one of a number of environmental documents which may ultimately be required for the Council's water budget proposal.

3. For the reasons described above, I have determined the proposed modification in operating Libby Dam will not significantly affect the quality of human environment, and an environmental impact statement is not required.

NORMAN C. HINTZ
Colonel, Corps of Engineers
District Engineer

Date: 1 July 1983

FINAL ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL IMPACTS CAUSED BY LIBBY DAM-LAKE KOOCANUSA PROJECT RELEASING WATER BUDGET FLOWS RECOMMENDED BY THE NORTHWEST POWER PLANNING COUNCIL

JUNE 1983

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SECTION 1. INTRODUCTION

1.1 Purpose of Action. This environmental assessment (EA) evaluates the non-power environmental impacts that could occur from modifying the operation of the Libby Dam-Lake Koocanusa project to contribute, in part, to a regional objective of providing in 1984 transportation flows or a "Water Budget" as adopted by the Pacific Northwest Electric Power and Conservation Planning Council (PNEPCPC). Flows recommended by the fisheries agencies and Indian tribes are evaluated as alternatives. The objective of the Water Budget is to improve the survival of juvenile salmon and steelhead in their spring downstream migration to the Pacific Ocean. Maximizing safe movement of juvenile salmonids and perpetuation of anadromous fish runs are regarded as priority items by the Council.

1.2 Background.

a. The Pacific Northwest Electric Power Planning and Conservation Act (Public Law 96-501) was passed in 1980 establishing a new regional body called the PNEPCPC. The Council is required by the act to develop a conservation and electric power plan that assures adequate future energy supplies and a fish and wildlife program that protects, mitigates, and enhances fish and wildlife in the Columbia River and its tributaries. Under Section 4h(11) of the Act, plans developed by the Council are to be implemented by Bonneville Power Administration (BPA). This Act requires that BPA and other Federal agencies responsible for managing, operating, or regulating Federal or non-Federal hydroelectric facilities on the Columbia River on its tributaries exercise such responsibilities in a manner consistent with the Act and its purpose of protecting, mitigating and enhancing fish and wildlife resources.

b. As part of these responsibilities, the Council prepared a fish and wildlife program based on recommendations provided by the fish and wildlife agencies and Indian tribes. One element of the fish and wildlife program, adopted by the Council 15 November 1982, was the provision of fish transportation water flows or a Water Budget for the purpose of improving the survival of juvenile salmon and steelhead as they migrate seaward past the dams during the spring months.

c. The basic concept of the Water Budget, its possible overall effects on the system, upstream storage reservoirs, and fish and wildlife resources was discussed and coordinated with Federal, state, and private entities. Seattle District provided technical data on Libby Dam project to the Montana Fish, Wildlife, and Power Ad Hoc Committee. Exchange of information was facilitated by ongoing fish and wildlife studies being carried out by the State of Montana under contract with Seattle District Corps of Engineers.

1.3 The Water Budget. The fish and wildlife program establishes a total Water Budget of 78,000 cubic feet per second-months (c.f.s. - months) (4.64 million acre-feet) to be divided into 58,000 c.f.s.-months (3.45 million acre-feet) at Priest Rapids Dam and 20,000 c.f.s.-months (1.19 million acre-feet) at Lower

Granite Dam. The Water Budget requirement has been simplified for study purposes and is assumed to be an average of 85,000 c.f.s. at Lower Granite and 134,000 c.f.s. at Priest Rapids for the month of May. The studies were undertaken to identify the impacts of altenative modes of operation for the Water Budget and their impact on operation for other project purposes. In actual practice the Water Budget may be utilized during a 61-day period of 15 April through 15 June. Firm power flows have been specified in the fish and wildlife programs to provide a base from which to measure Water Budget usage. Water Budget usage is to be measured as the difference between the actual average weekly flows which result at Priest Rapids and Lower Granite and the firm power flows. The firm power flows are as shown below and the Water Budget concept is illustrated on figure 1.

	Firm Power Flow in 1,000 c.f.s.	
	Priest Rapids	Lower Granite
15 Apr through 30 Apr	76	50
1 May through 31 May	76	65
1 Jun through 15 Jun	76	60

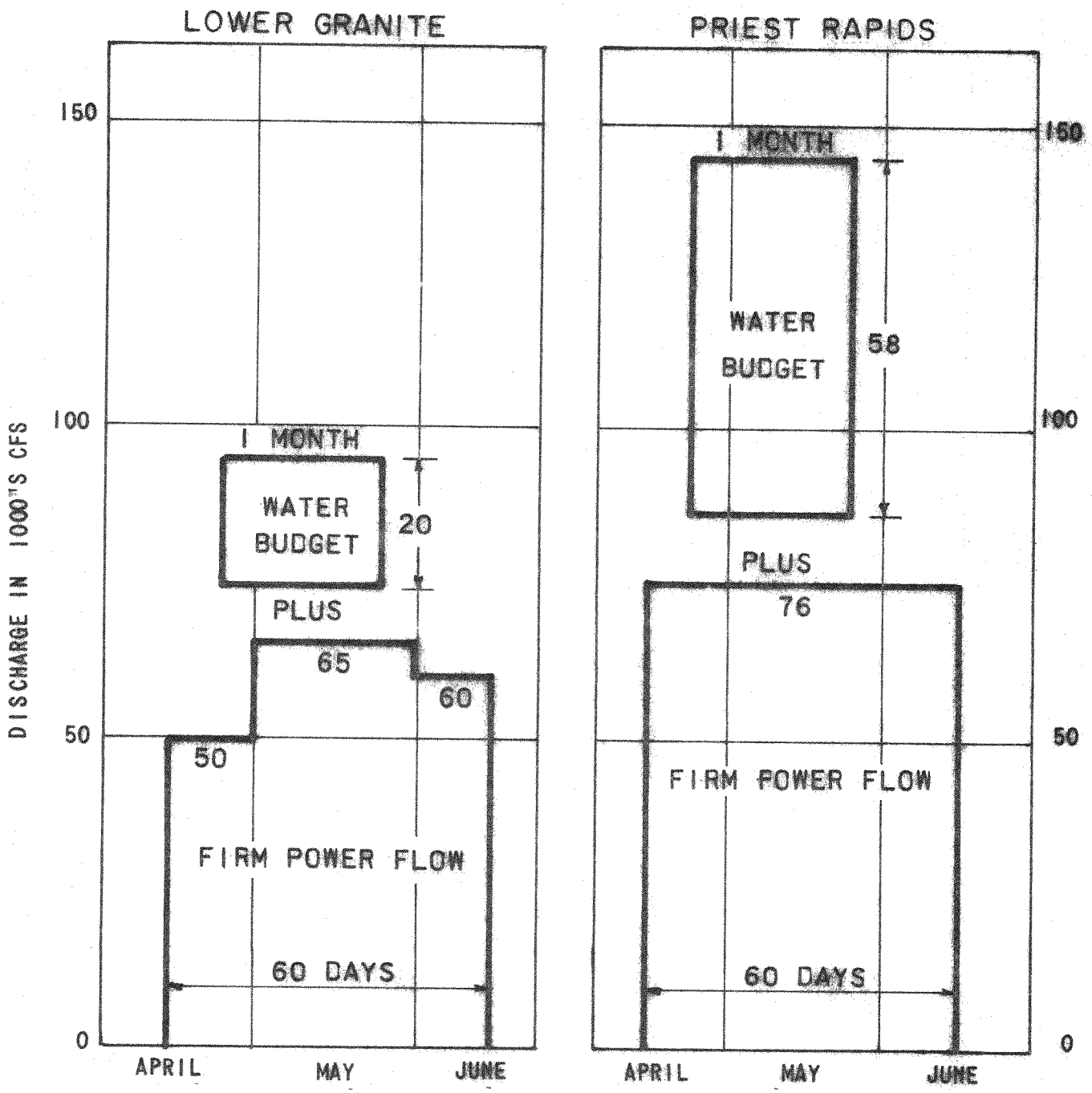
The Water Budget is made available by retaining water in low runoff years that previously was released during the fall and winter months for firm energy load carrying capacity (FELCC). The five storage projects that are utilized for this purpose are all located in the United States and consist of Libby (Corps of Engineers), Hungry Horse and Grand Coulee Dam (both Bureau of Reclamation) located above Priest Rapids, and Dworshak (Corps of Engineers, and possibly Brownlee (Idaho Power Company) located above Lower Granite. This storage is then available for release during the spring juvenile anadromous fish migration period during those years when runoff conditions are adverse and flow augmentation is required. The impact on FELCC resulting from the Water Budget requirement is estimated to be 500 average megawatt (MW). This average FELCC impact and the generation resulting from the Water Budget implementation is shown on figure 2.

Water Budget implementation must not conflict with nonpower constraints. For example, the fish and wildlife program recognizes that physical storage of the Water Budget will be precluded some years due to the evacuation of reservoirs for flood control. All five of the storage reservoirs previously identified as Water Budget participants have flood control responsibilities. Flood control regulation requires that storage space be available at the beginning of the flood season (say 1 April) so that runoff can be stored during the spring snowmelt season to reduce peak discharges at downstream flood damage centers. The required amount of flood control space is variable and is dependent on the magnitude of the volume of runoff estimates for the specific year. The Dwoshak and Libby reservoir flood control rule curves (figures 3 and 4) are used to illustrate the constraint that flood control operation places on retention of reservoir storage prior to the beginning (15 April) of the Water Budget period. The 40 years of runoff data that are used for power studies (1929-68) illustrate the frequency of the magnitude of reservoir evacuation for flood control regulation. Figure 3 shows that the April-July volume of

runoff at Dworshak will require complete evacuation of the reservoir by 1 April in 16 of the 40 study years. The Libby reservoir flood control rule curves (figure 4) show that Libby is completely evacuated by April in 7 of the 40 study years. Results from these 40-year studies also show that the Water Budget requirement during years that have average or above runoff volumes will be provided by unregulated runoff and because of this Water Budget requirements will not be dependent upon releases from reservoir storage.

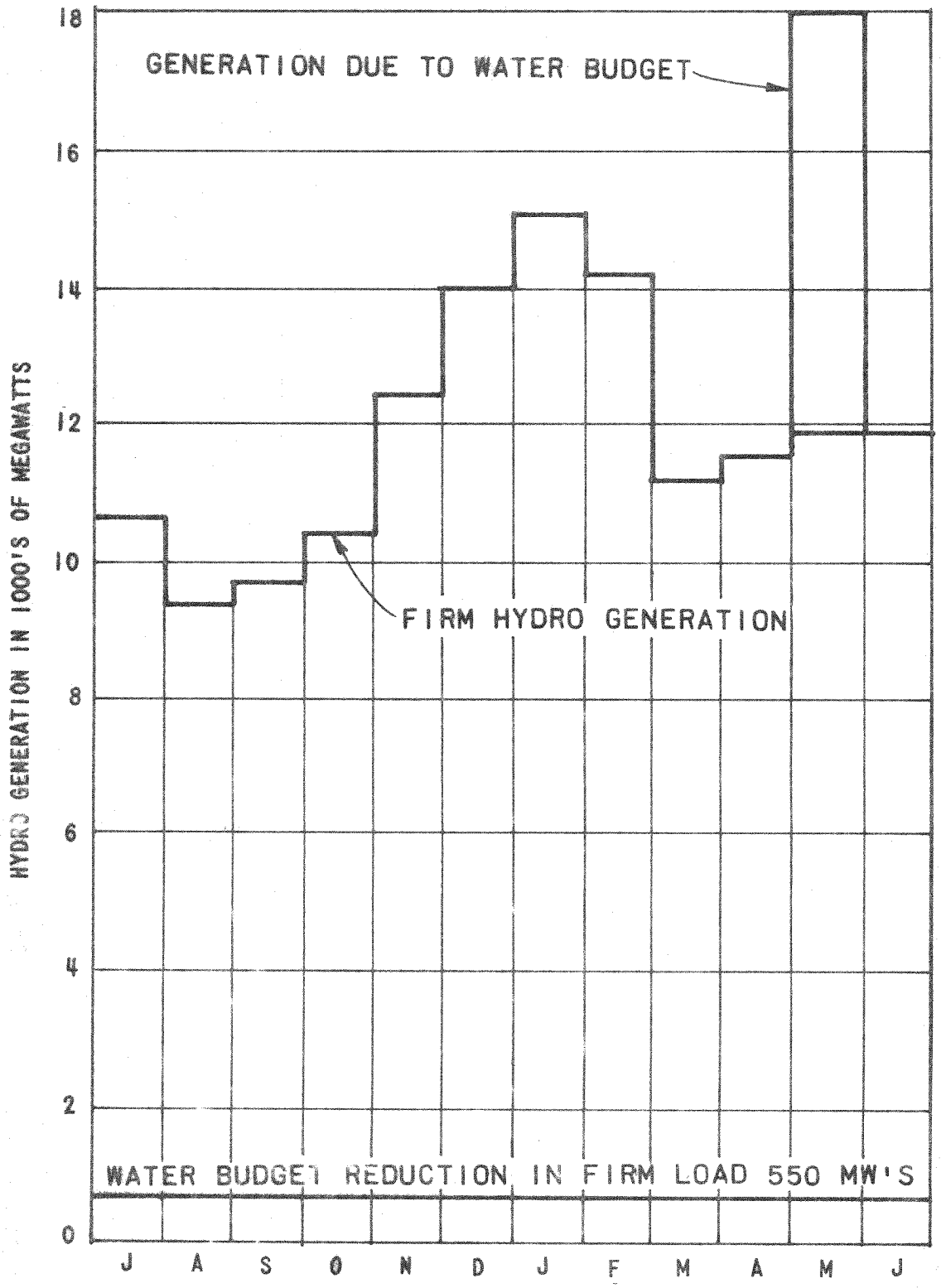
During years of low runoff the Water Budget requirement will be provided from storage made available by the reduction of the 500 MW of FELCC. It is anticipated that approximately one-fourth of the years will fall into the critical low flow category. Water Budget releases from the five previously identified reservoirs will be made to meet the flow requests of the Water Budget managers for the Lower Granite and Priest Rapids control points. Control point flows exceeding the firm power flows resulting from the Water Budget managers' request will be considered to apply towards the Water Budget requirement.

During years of low to average runoff, the Water Budget will be made up of a combination of uncontrolled runoff and reservoir storage. As the volume of runoff increases, less of the Water Budget will come from reservoir storage reserved from the 500 MW reduction in FELCC. It is anticipated that when runoff volumes are normal and above, the Water Budget requirement will come largely from unregulated runoff, but the flexibilities of the reservoir system will be utilized to provide Water Budget flows as requested by the Water Budget managers. A summary of the impacts of the Water Budget on power production is combined in the appendix (Section 8) of this assessment.



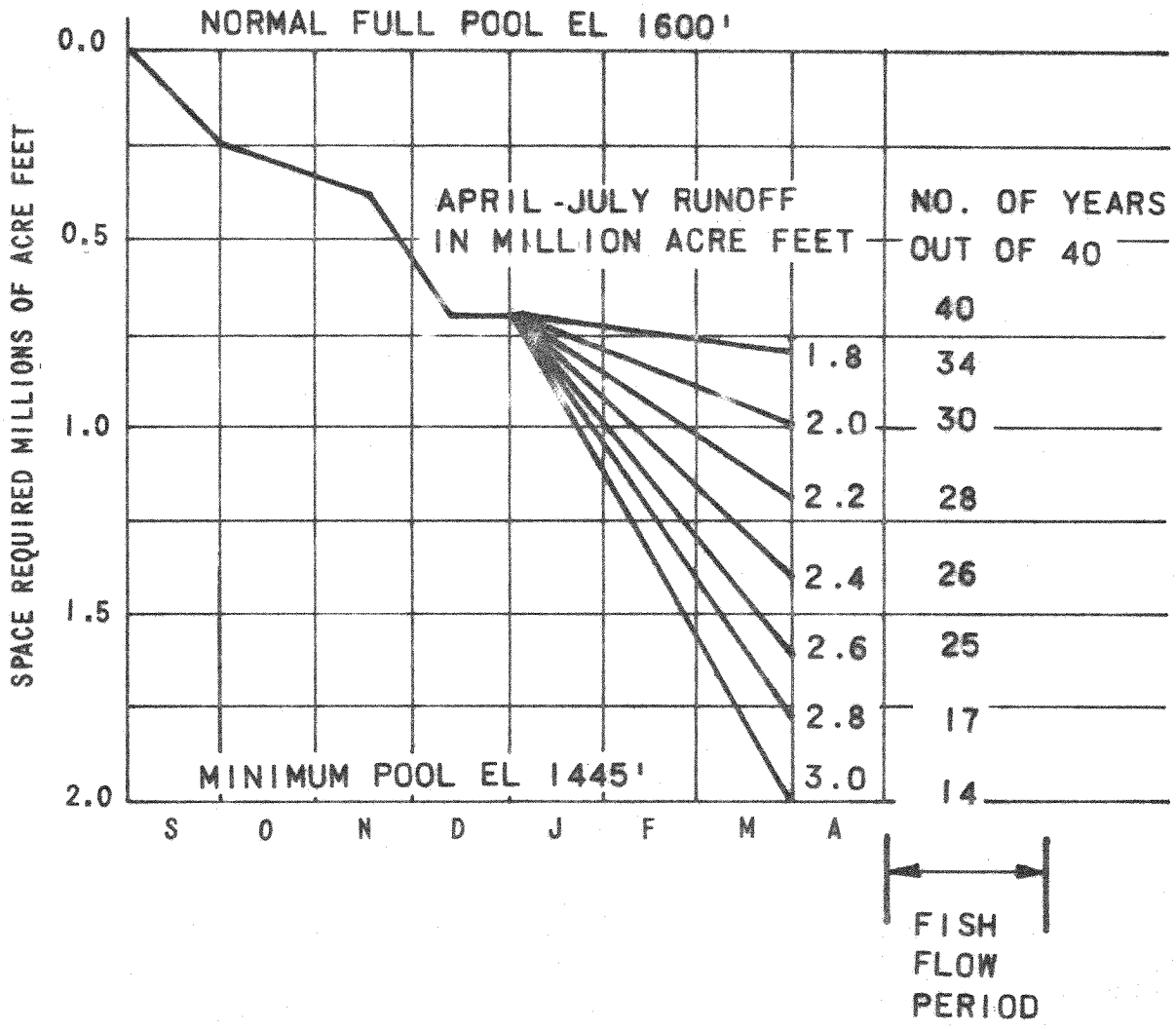
FISH & WILDLIFE PROGRAM WATER BUDGET

FIGURE 1



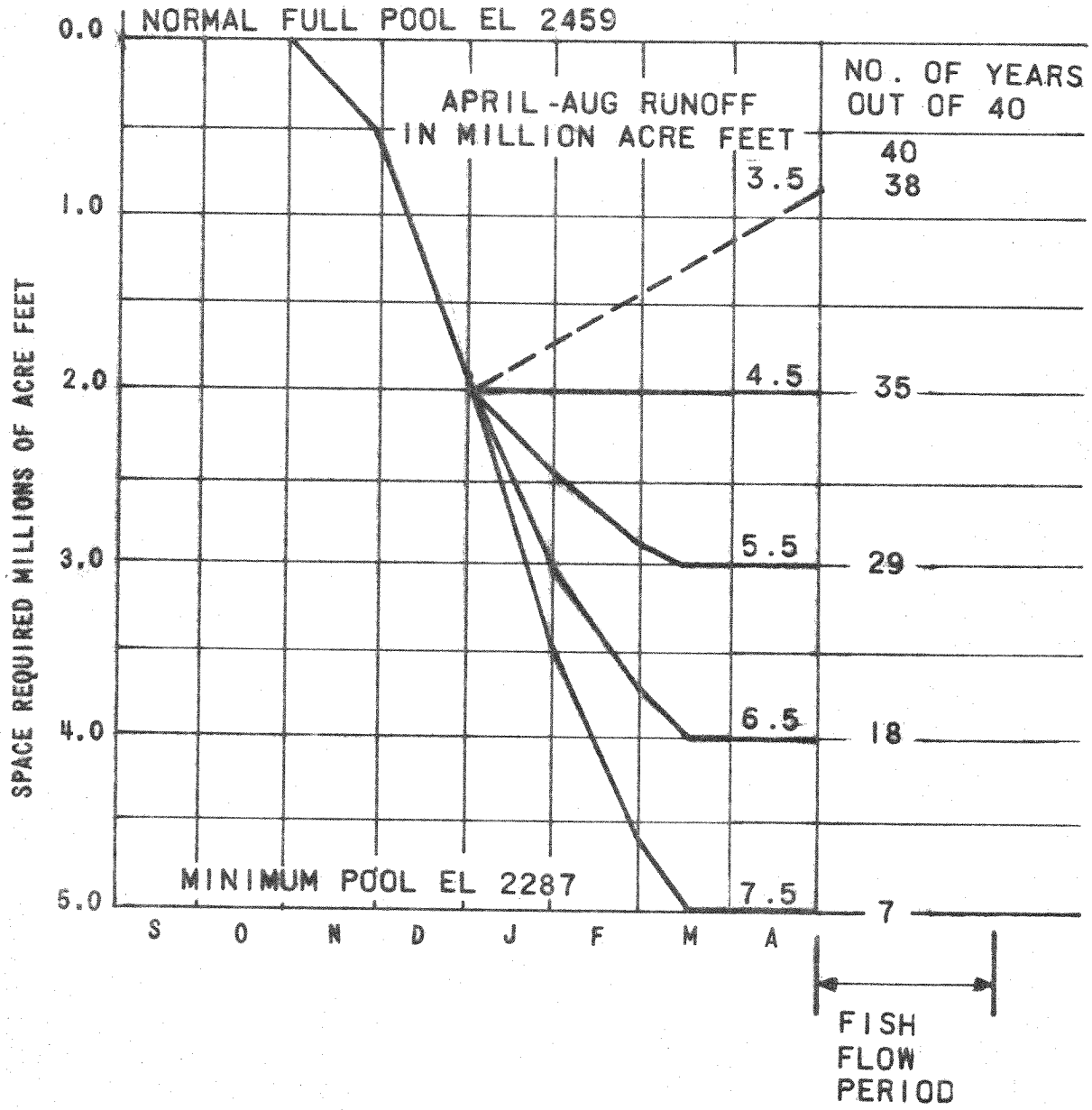
HYDRO GENERATION WITHOUT AND WITH WATER BUDGET

FIGURE 2



DWORSHAK RESERVOIR
FLOOD CONTROL RULE CURVES

FIGURE 3



LIBBY DAM PROJECT

FLOOD CONTROL RULE CURVES

FIGURE 4

SECTION 2. LIBBY PROJECT DESCRIPTION

2.1 Purpose. Libby Dam was authorized by the Flood Control Act of 17 May 1950, 81st Congress, 2nd Session, for the primary purposes of flood storage for local flood control protection in Montana and Idaho, main stem flood control in the lower Columbia River, hydroelectric power generation at site and at downstream plants through release of this storage, and for recreational development.

2.2 Location. Libby Dam is located on the Kootenai River about 221.9 miles upstream from the confluence of the Kootenai and Columbia Rivers and about 17 miles upstream from the city of Libby, Lincoln County, Montana. Lake Koocanusa, at full pool elevation 2,459 feet National Geodetic Vertical Datum, is 90 miles long and extends 42 miles into Canada.

2.3 Dam. The dam is a concrete gravity structure 2,900 feet long rising 427 feet above bedrock. Outlet structures consist of two ogee-type overflow spillways controlled by tainter gates with a full pool discharge capability of 150,600 c.f.s., three sluiceways with a combined capability of 61,400 c.f.s., and eight penstocks, only four of which are currently operational. The powerhouse contains four turbines, each with a maximum hydraulic capability of 5,400 c.f.s., with provision for four additional units of comparable size. Each of the four generators has a rated capacity of 105 MW, yielding a total plant capacity of 420 MW. An additional turbine generator now under construction will increase the plant capacity to 525 MW, with a maximum hydraulic capability of 27,000 c.f.s. A selective withdrawal system contiguous to the penstock intakes on the upstream face of the dam provides the flexibility to control downstream water quality and temperatures and to a lesser degree the downstream movement of plankton and fish.

2.4 Reservoir. Lake Koocanusa, which was formed with closure of Libby Dam in 1972, is a long narrow reservoir having a length of 90 miles and a maximum width of 2-1/2 miles. At normal maximum pool, elevation 2,459 feet, the reservoir has a shoreline length of 224 miles, a water surface area of 46,456 acres (17,462 acres in Canada), and a volume of 5.9 million acre-feet. It has a usable storage capacity of approximately 5 million acre-feet. A drawdown of 172 feet to minimum pool elevation 2,287 feet dewaters the upper 44 miles, including the entire Canadian portion of the reservoir, and reduces the surface area of the reservoir to 14,487 acres or by 69 percent and the volume to 0.9 million acre-feet or by 85 percent.

2.5 Project Operation.

a. The Kootenai River historical mean annual flow is 12,170 c.f.s. with extremes ranging from a maximum of 121,000 c.f.s. to a minimum of 895 c.f.s. prior to regulation by Libby Dam. In a free flowing condition the river normally peaked at about 60,000 c.f.s. during the months of April, May, and June, and within this period, discharged 60 to 70 percent of the total annual runoff. The flows gradually declined during July to less than 8,000 c.f.s. in

August and seldom exceeded this flow throughout the remainder of the year. Flows of 4,000 c.f.s. or less frequently occurred during the months of December and January.

b. Lake Koocanusa is regulated to maintain surface water levels between maximum pool elevation of 2,459 feet and minimum elevation of 2,287 feet, or a vertical distance of 172 feet. Average drawdown is about 120 feet. The reservoir is drafted during the fall and winter months to accommodate the spring snowmelt runoff; refilled during April, May, and June; and is held at full pool from mid-July through September. Reservoir drawdown for power generation and flood control begins in October and usually continues into March. Based upon runoff projections, reservoir elevations are adjusted to accommodate the needs for both hydroelectric power and flood storage.

c. Existing downstream fluctuation and flow criteria are as follows:

MINIMUM DISCHARGE

1. Normal - 4,000 c.f.s.

2. If required to refill - 3,000 c.f.s.

3. Short duration power emergencies - 2,000 c.f.s.

MAXIMUM TAILWATER FLUCTUATION

1. May through September - 1 foot per hour, 4 feet per day.

2. October through April - 1 foot per 1/2 hour, 6 feet per day.

STABLE FLOWS BELOW 8,000 c.f.s. In order to improve sport angling in the river, the project is operated (whenever feasible) at flows below 8,000 c.f.s. on weekends and holidays during the 1 May to 15 September period. Effort is made to maintain these flows from 3 hours before sunset to 1 hour after sunset on weekdays when practicable.

d. Under existing conditions, releases normally range up to the 21,600 c.f.s. four-unit powerhouse hydraulic capacity. Regulated releases from Libby Dam vary seasonally from average monthly streamflows of 5,000 to 10,000 c.f.s. in the summer and to 15,000 to 25,000 c.f.s. in the winter. Hourly and daily variations occur due to hydropower generation up to the powerhouse hydraulic capacity. Releases in excess of powerhouse hydraulic capacity are required for: (1) drafting of reservoir storage in early spring to establish reservoir storage capacity for flood control regulation and (2) regulating water releases during the spring runoff period, or immediately thereafter, to safely refill the reservoir and provide downstream flood control.

e. Water temperature control is accomplished by use of a selective withdrawal system which allows water to be withdrawn from the reservoir at any

selected depth above elevation 2,222 feet. An outflow temperature rule curve was developed to provide near optimum midsummer temperatures for fish while at the same time maintaining bulkhead elevation which minimize fish losses in project discharges from the upper strata of the reservoir. The selective withdrawal system is typically placed in operation in April with the installation of bulkheads. The bulkheads are stacked in and/or removed from the bays of the withdrawal structure as necessary to maintain the desired downstream temperature. All bulkheads are removed and stored in the late fall when the lake becomes isothermal.

f. Libby Dam discharges are regulated to comply with the requirements for the operation of Kootenay Lake as set forth in the 1938 Order of the International Joint Commission (IJC). Releases from Libby Dam during the fall and winter period are selected to evacuate Lake Koocanusa and provide storage space for spring flood control within the constraints of the IJC order on Kootenay Lake. The order, in substance, requires that when the lake level at Nelson on its falling stage recedes to elevation 1,743.32 feet, the lake level may be held at that elevation until 31 August when the level of Kootenay Lake may be raised to elevation 1,745.32 feet. This maximum storage level may be maintained until 7 January when the lake must be progressively lowered so that it will not exceed an elevation of 1,744.0 feet on 1 February, 1,742.4 feet on 1 March, and 1,739.32 feet on 1 April.

SECTION 3. AFFECTED ENVIRONMENT

3.1 General. The Libby Dam-Lake Koocanusa project converted a 90-mile section of the free flowing Kootenai River into a reservoir and modified the physical, chemical, and biological characteristics of the river downstream. These changes have had both beneficial and detrimental environmental effects upon the system. Because of the young age of the reservoir, the biological components of the system are unstable and are continuing to adjust to the changed conditions. Changes in the composition and abundance of certain fish and wildlife populations are occurring at present and future changes can be expected.

3.2 Geographic Description.

a. The Kootenai River Basin is located between 48 and 51 degrees north latitude and 115 and 118 degrees west longitude and includes within its boundaries parts of southeastern British Columbia, northern Idaho, and northwestern Montana. The basin measures 238 miles long by 153 miles wide and has an area of 19,300 square miles. About one-quarter of the area, or about 4,800 square miles, lies in the United States. The drainage area above Libby Dam totals 8,985 square miles. About 86 percent, or 7,770 square miles, of the drainage area above Libby Dam lies in Canada.

b. The Kootenai River has a length of approximately 485 miles of which 165 miles, or about one-third of its length, is in the United States. The source of the Kootenay River is located in Kootenay National Park, British Columbia, adjacent to the Continental Divide and about 30 miles west of Banff, Alberta. From its source it flows about 100 miles south entering the Rocky Mountain Trench near Canal Flats, only 1.5 miles from Columbia Lake, the headwaters of the Columbia River. From this point the river continues southward another 100 miles entering the United States in the vicinity of Rexford, Montana, where it leaves the Rocky Mountain Trench and continues, passing southward through the mountains of the Purcell Range for about 50 miles to the confluence of the Fisher River. Here the river turns abruptly west, passing over Kootenai Falls in a gap between the Cabinet and Purcell Mountains. Near Troy, the river trends northwestward to Bonners Ferry where it enters the Purcell Trench. At Bonners Ferry the valley widens and the river meanders northward 47 miles, where it reenters Canada. Shortly after crossing the border, the river flows into Kootenay Lake. From the west arm of Kootenay Lake, the river flows 23 miles west to its junction with the Columbia River.

3.3 Fish.

a. The free flowing Kootenai River prior to the construction of Libby Dam provided good fishing. Mountain whitefish, the primary species, and rainbow and cutthroat trout were taken. The Kootenai River as a fishery resource was recognized by the Montana Stream Classification Committee in 1959 when the 67-mile segment from Libby upstream to the Canadian border was classified as a class 2 stream, or a stream of statewide significance. The remaining 33 miles

in Montana extending downstream from Libby was referred to as class 3 designation, or a stream of value to large districts of the state. Most of the larger tributaries, such as the Fisher and Tobacco Rivers, were given a class 3 designation; while many of the smaller tributaries were placed in class 4, a category of stream of value to smaller districts of the state. Fishing in the free flowing Kootenai River was seasonable due to the high turbid flows which normally characterized the river for about a 3-month period during spring runoff. Construction of Libby Dam created two separate ecological environments, a regulated river downstream from the dam and a fluctuating lake or reservoir upstream from the dam, each with its distinctive fishery.

b. The river downstream from Libby Dam to Kootenai Falls has developed into an excellent rainbow trout fishery with success rates comparable to the best blue ribbon streams in Montana. Although recreational fishing is frequently restricted by water level fluctuation caused by hydropower peaking at the dam, it is far superior to that which existed in the free flowing river prior to the dam due in part to the flow, temperature, turbidity, and other water quality changes caused by Libby Dam and in part due to pollution abatment measures. Gas supersaturation limited the fish population immediately following impoundment but in recent years, a large, but underutilized, whitefish population has developed in the river. This population is assumed to be a factor in the somewhat smaller rainbow sizes now characterizing the catch.

c. The reservoir was heavily stocked with westslope cutthroat trout in the early years following impoundment. These fish, along with the rainbow, formed the backbone of what developed into an excellent fishery. In recent years, the rainbow have tended to dominate the reservoir's game fish population. Kokanee from an unidentified introduction have increased in numbers and now make up a significant part of the fisherman's catch. The appearance of these fish will undoubtedly change the biological balance of the reservoir and necessitate a reassessment of management options. Mitigation efforts from construction of the Libby Dam-Lake Koocanusa project have included construction of a westslope cutthroat trout hatchery on Lake Koocanusa, tributary stream improvement including construction of a fish barrier dam, and reservoir stocking. Reservoir regulation schedules, procedures, and objectives that provide favorable fishery conditions are included as an ongoing operation requirement.

3.4 Wildlife.

a. The Kootenai River Basin in the vicinity of Lake Koocanusa and near the river below Libby Dam is characterized by coniferous forests of ponderosa pine, Douglas fir, and western larch. Near the river and along stream, the vegetation is primarily deciduous, consisting of cottonwoods, willows, birchs, alders, and many species of shrubs. Big game animals such as bighorn sheep, elk, white-tailed deer, black-tailed deer, moose, black bear, and cougar are all relatively common in the area. Other common mammals include coyote, beaver, mink, muskrat, bobcat, weasel, red squirrel, Columbian ground squirrel, yellow pine chipmunk, porcupine, and several other species of rodents.

b. The most visible birds are waterfowl, especially Canada goose, mallard, common merganser, common goldeneye, American wideon, gadwall, green-winged teal, and wood duck. The most common upland game birds are blue spruce and ruffed grouse. Other birds include American kestrel, osprey, red-tailed hawk, rough-legged hawk, several species of owls, many woodpeckers, six species of swallows, and many species of perching birds.

c. In general, the construction of Libby Dam project has had a negative impact upon wildlife. Mitigation efforts, including the purchase of wildlife lands and intensive management of forest land for wildlife, are continuing.

3.5 Endangered Species.

a. The construction and operation of Libby Dam has provided unexpected benefits for wintering bald eagles downstream of the dam. This river section has been ice free because of the warmer water released from the dam; consequently, eagle use of the area has increased since 1973.

b. Dead or distressed fish coming through the dam, waterfowl, and carrion attract and provide a food source for eagles below the dam. Cottonwoods and evergreens lining the river shoreline provide day and night perches for the eagles. Eagles generally begin to make their appearance in the area in late October and leave near the end of March. Most of the eagles seen during the winter in this area remain only for a few days. Only about 2 percent of the eagles passing through remain for the entire winter. Generally, between three and six birds stay through the winter.

3.6 Water Quality.

a. The Kootenai River is as a fast flowing, cold water river containing moderately hard to hard water of the highly "buffered" calcium bicarbonate type with a pH of about 8.0. The river is quite fertile, as shown by the high dissolved solids and nutrient content. Dissolved oxygen concentrations are at or near saturation and indicate, along with the low observed values for biochemical oxygen demand, that the river is effective in assimilating organic loads without respiratory stress to aquatic life.

b. Libby Dam has improved the water quality of the Kootenai River with Lake Koocanusa acting as a settling pond. High turbidities and sediment loads formerly occurring during spring runoff have been practically eliminated. This, coupled with the high degree of temperature control exercised by the selective withdrawal system and pollution control in the upstream watershed, has had positive effects upon the project's fish population.

c. Discharge over the spillway or through the sluices causes nitrogen supersaturation in the river below Libby Dam which, during construction of the dam, was as high as 140 percent immediately below the project. Since completion of the turbines, nitrogen supersaturation has seldom exceeded the state standard of 110 percent. Should discharge through the sluices or over the spillway be required, the project is operated to pass as much water as possible

through the power units to dilute the spilled water, thus reducing supersaturation levels. Studies indicate that nitrogen saturation levels can be maintained at 110 percent or lower (state standard) under all but the most extreme conditions.

3.7 Recreation.

a. Libby Dam project has expanded recreational opportunities and usage in the vicinity of Libby, Montana. Recreational activities include boating, fishing, swimming, day use, camping, hiking, and sightseeing. Lake Koocanusa is the only near by body of water in the Libby vicinity that provides the opportunity for swimming and open water boating. The excellent fishing has been responsible, to a large degree, for the major increases in recreational use of the reservoir. Public boat launches and a private marina on Lake Koocanusa provide boater access to the reservoir waters and the miles of scenic shoreline. Access to the lake via these facilities is seasonal due to winter drawdown. Elevations of improved boat ramps on Lake Koocanusa are shown below:

Name of Facility	Elevation at Bottom of Paved Ramp (feet)	Distance Below Full Pool (feet)
McGillivray	2,439	20
Cripple Horse	2,350	109
Peck Gulch	2,350	109
Rexford Bench	2,400	59
Tobacco Plains	2,419	40
Barron Creek	2,287	172

The Souse Gulch boat dock is usable only above elevation 2,438 feet. A number of unimproved boat ramps are usable only at near maximum pool elevations.

b. The Corps of Engineers has constructed campgrounds, day use areas, and hiking trails adjacent to the lake. A visitors' center, observation tower, and viewpoints have been constructed at the dam, and powerhouse tours are provided to the public. With the exception of the Souse Gulch day use area, all recreation facilities in the United States are administered by the U.S. Forest Service (USFS). Nearly all the lands surrounding the reservoir in the United States are under the jurisdiction of the USFS.

c. Recreational activities on the river below Libby Dam are related primarily to fishing either from the banks of the river or on float trips by rafts or small boats. The recreational fishery has increased significantly in recent years. Unimproved ramps are located at a number of locations downstream from the dam.

3.8 Cultural Resources. During spring drawdowns in 1981-1982 an intensive cultural resources survey of Lake Koocanusa (within the United States) was conducted by Washington State University. A total of 249 cultural resource sites and 50 isolated finds have been identified. Evaluation of these sites is now in progress. Three archeological districts have tentatively been proposed for National Register eligibility, pending other agency review and concurrence. These sites and districts represent primarily prehistoric resources, with some known historic Kutenai Indian encampments and European trading posts established during the fur trade in the 19th Century.

SECTION 4. ALTERNATIVES

Numerous operating modes and alternative methods of implementing the Council's Water Budget were considered during the early stages of study development. Most of the alternatives were eliminated due to their adverse hydrologic or environmental impacts. Four alternative plans were given detailed consideration.

4.1 Alternative Plan 1: Continue the Existing Method of Operation of Libby Project (No-Action Alternative). The existing method of project operation, as described in section 2, is to maximize the project hydropower and flood protection potential. Mid-Columbia River flows downstream of Priest Rapids Dam would not change with the present method of operation. This alternative would not meet the Water Budget objectives of increasing transportation flows for juvenile salmonids during 15 April to 15 June. This is the base case.

4.2 Alternative Plan 2: Use of Libby Project to Supply its Apportioned Share of Water Budget Recommended By the Council.

a. The water budget flows in the mid-Columbia River must be provided by Grand Coulee Dam within the 15 April to 15 June time period; consequently, flows at Libby Dam will be reduced during the same time period to balance power needs. Libby Dam will release its apportioned share of the Water Budget to Grand Coulee reservoir prior to, and immediately after, Water Budget releases by Grand Coulee Dam.

b. Reservoir elevations and flow releases at Libby project provided under existing operations were compared with those provided by the Water Budget. The differences between base case and Water Budget were the basis for measuring impacts. Project operation is depicted in table 1 (reservoir drawdown below full pool at month end) and table 2 (average monthly river flows). Three flows were examined: (1) average of 40 years of record from 1928 to 1968, (2) a "typical dry" year (1940-1941), and (3) a "typical wet" year (1955-1956). The magnitude of difference between Water Budget operation and base case operation each year would depend on the volume of runoff forecast, maximization of power generation, and flood control while maintaining the Water Budget flows.

c. Reservoir operation as shown in table 1 depicts monthly reservoir drawdown in feet below full pool (2,459 feet). The 40-year average shows the change in relative reservoir elevation is greatest in November (12.5 feet) when the drawdown for the Council Water Budget is less than for base case (existing) operation methods. The same general trend is observed in wet and dry years. In the dry year, the greatest variation occurs in November when the reservoir would be a calculated 17.1 feet higher than base case. During the wet year (1955-1956), drawdown differences are less noticeable.

d. Kootenai River discharges from Libby Dam are shown on table 2 as the average monthly flow in thousands of c.f.s. The 40-year average shows the calculated Water Budget flows are greater than base case flows in December-February and in June and July. In other months, the base case flows are

TABLE 1 - LIBBY RESERVOIR DRAWDOWN BELOW FULL POOL AT END OF MONTH
COMPARISON OF BASE CASE METHOD OF OPERATION TO PROPOSED COUNCIL WATER BUDGET OPERATION

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average
Average All Years - (1928-1968)													
Reservoir Drawdown - base case	3.8	3.6	5.6	14.0	33.0	56.1	87.7	112.5	128.8	121.6	66.8	13.6	53.8
(in feet) - water budget	4.2	3.9	4.2	7.8	20.5	52.9	86.0	115.0	125.5	117.3	63.1	13.2	51.0
Difference 1/	(0.4)	(0.3)	1.4	6.2	12.5	3.2	1.7	(2.5)	3.3	4.3	3.7	0.4	2.8
Typical "Dry" Year (1940-1941)													
Reservoir Drawdown - base case	0.8	0.5	4.6	9.8	28.3	52.5	55.9	57.3	58.6	60.4	44.4	22.6	32.8
(in feet) - water budget	0	0	0	0	11.2	49.1	49.6	50.6	49.7	40.8	18.8	10.8	23.5
Difference 1/	0.8	0.5	4.6	9.8	17.1	3.4	6.3	6.7	8.9	19.6	25.6	11.8	9.2
Typical "Wet" Year (1955-1956)													
Reservoir Drawdown - base case	0	0	0.4	3.5	20.7	49.1	100.0	153.8	172	172	67.3	0	61
(in feet) - water budget	0	0	0	0	11.2	49.1	101.2	153.8	172	172	67.3	0	59.9
Difference 1/	0	0	0.4	3.5	9.5	0	(1.2)	0	0	0	0	0	(1.1)

1/Parenthesis denotes water budget reservoir elevations are lower than in base case.

TABLE 2 - AVERAGE MONTHLY RIVERFLOWS IN THOUSANDS OF CUBIC FEET PER SECOND
COMPARISON OF BASE CASE METHOD OF OPERATION TO PROPOSED COUNCIL WATER BUDGET OPERATION

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average
Average All Years - (1928-1968)													
River Flows - base case	12.7	6.8	8.0	11.6	17.4	18.1	18.7	13.7	8.5	6.9	5.7	5.1	11.2
- water budget	13.2	6.7	6.7	8.3	13.7	24.4	19.3	15.1	6.7	6.7	5.4	7.1	11.2
KCFS Difference 1/	.5	(.1)	(1.3)	(3.3)	(3.7)	6.3	.6	1.4	(1.8)	(.2)	(.3)	2.0	0
Typical "Dry" Year (1940-1941)													
River Flows - base case	3.0	4.4	9.1	9.2	16.5	18.0	4.6	3.3	4.2	9.9	8.6	3.0	7.8
- water budget	9.0	4.3	5.9	5.4	12.3	27.5	3.0	3.0	3.0	3.0	3.0	12.0	7.7
KCFS Difference 1/	6.0	(.1)	(3.2)	(3.8)	(4.2)	9.5	(1.3)	(.3)	(1.2)	(6.9)	(5.6)	9.0	(.1)
Typical "Wet" Year (1955-1956)													
River Flows - base case	19.1	7.7	6.6	9.6	19.0	22.8	28.9	22.3	8.8	20.5	6.8	6.6	14.5
- water budget	17.2	7.7	6.3	7.3	15.2	29.1	29.3	21.8	8.8	20.5	6.8	6.6	14.3
KCFS Difference 1/	(1.9)	(.0)	(.3)	(2.3)	(3.8)	6.3	.4	(.5)	0	0	0	0	(.2)

1/Parenthesis denotes water budget flows are less than base case flows.

greater. A similar trend is noted in a typical dry year (1940-1941) when the Water Budget flows are greater than base case flows in December (9,500 c.f.s.) and June-July (9,000-6,000 c.f.s.). In other months, the base case flows are greater. During the wet year (1955-1956), water budget flows were calculated as greater in December and January. In other months, the base case flows were nearly the same or greater.

e. Operation of Libby Dam project to support the proposed Water Budget plan is governed by requirements not to violate the Kootenay Lake levels specified by the IJC order.

4.3 Alternative Plan 3: Use of Libby Project to Supply Its Apportioned Share of Water Budget Recommended by the Fish Agencies. The fisheries agencies submitted a Water Budget proposal to the PNEPPCC which varies from the Council Water Budget recommendation. That portion of the fish agency Water Budget plan for the mid-Columbia River is the same as the Council plan which is described in alternative 2.

4.4 Alternative Plan 4: Use of Libby Project to Supply Its Apportioned Share of Water Budget Recommended by Indians Tribes.

a. The Libby reservoir elevation and flow releases to meet the water budget recommended by the Indian Tribes were compared to base case operation. Reservoir operation is depicted in table 3 (reservoir drawdown below full pool at month end) and table 4 (average monthly river flows). The average of 40 years, a dry year, and wet year were examined using the same procedure described in the Council Water Budget alternative. The Tribal Water Budget proposal recommends a quantity of firm load storage in mid/upper Columbia River reservoirs to provide flows approximately 134,400 c.f.s. at Priest Rapids Dam for 46 days during 15 April through 15 June. (This can be compared to the Council Water Budget of approximately 130,000 c.f.s. for 31 days during the same time period.)

b. Reservior operation as shown in table 3 depicts monthly reservoir drawdown in feet below full pool (2,459 feet). The 40-year average shows the change in relative reservoir elevation is greatest in November (11.9 feet) when the drawdown for the Tribal Water Budget is less than for base case (existing) operation methods. The same general trend is observed in wet and dry years. In the dry year, the greatest variation occurs in November when the reservoir would be a calculated 17.1 feet higher than base case. During the wet year (1955-1956), drawdown differences are less noticeable and are the same as the Council Water Budget.

c. Kootenai River discharges from Libby Dam are shown on table 4 as the average monthly flow in thousands of c.f.s. The 40-year average shows the calculated Tribal Water Budget flows are greater than the base case flows in December-February, and in May, June, and July. Other months the base case flows are greater. A similar trend is noted in a typical dry year (1940-1941) when the Water Budget flows are greater than base case flows in December and June-July. In other months, base case flows are greater. During the wet year (1955-1956), water budget flows were calculated as greater in December and January. In other months, base case flows were nearly the same or greater. The constraints in operating Libby project for the Tribal Water Budget flow releases are the same as [illegible]ted in alternative 2, Council Water Budget.

TABLE 3 - LIBBY RESERVOIR DRAWDOWN BELOW FULL POOL AT END OF MONTH
COMPARISON OF BASE CASE METHOD OF OPERATION TO PROPOSED TRIBAL WATER BUDGET OPERATION

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average
Average All Years - (1928-1968)													
Reservoir Drawdown - base case	3.8	3.6	5.6	14.0	33.0	56.1	87.7	112.5	128.8	121.6	66.8	13.6	53.8
(in feet) - water budget	6.0	5.7	5.8	8.6	21.1	53.6	87.0	116.8	128.5	120.2	66.9	14.9	52.8
Difference 1/	(2.2)	(2.1)	(0.2)	5.4	11.9	2.5	0.7	(4.3)	0.3	1.4	(0.1)	(1.3)	1.0
Typical "Dry" Year (1940-1941)													
Reservoir Drawdown - base case	0.8	0.5	4.6	9.8	28.3	52.5	55.9	57.3	58.6	60.4	44.4	22.6	32.8
(in feet) - water budget	0	0	0	0	11.2	49.1	49.6	50.6	49.7	40.8	18.8	8.1	23.3
Difference 1/	0.8	0.5	4.6	9.8	17.1	3.4	6.3	6.7	8.9	19.6	25.6	14.5	9.5
Typical "Wet" Year (1955-1956)													
Reservoir Drawdown - base case	0	0	0.4	3.5	20.7	49.1	100.0	153.8	172	172	67.3	0	61
(in feet) - water budget	0	0	0	0	11.2	49.1	101.2	153.8	172	172	67.3	0	59.9
Difference 1/	0	0	0.4	3.5	9.5	0	(1.2)	0	0	0	0	0	(1.1)

1/Parenthesis denotes water budget reservoir elevations are lower than in base case.

TABLE 4 - AVERAGE MONTHLY RIVERFLOWS IN THOUSANDS OF CUBIC FEET PER SECOND
COMPARISON OF BASE CASE METHOD OF OPERATION TO PROPOSED TRIBAL WATER BUDGET OPERATION

		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Average
Average All Years - (1928-1968)														
River Flows	- base case	12.7	6.8	8.0	11.6	17.4	18.1	18.7	13.7	8.5	6.9	5.7	5.1	11.2
	- water budget	13.4	6.7	6.6	7.6	13.4	24.6	19.5	15.3	7.1	6.8	6.0	6.4	11.2
KCFS Difference 1/		.7	(.1)	(1.4)	(4.0)	(4.0)	6.5	.8	1.6	(1.4)	(.1)	.3	1.3	0
Typical "Dry" Year (1940-1941)														
River Flows	- base case	3.0	4.4	9.1	9.2	16.5	18.0	4.6	3.3	4.2	9.9	8.6	3.0	7.8
	- water budget	9.0	4.3	5.9	5.4	12.3	27.5	3.0	3.0	3.0	3.0	3.0	10.1	7.5
KCFS Difference 1/		6.0	(.1)	(3.2)	(3.8)	(4.2)	9.5	(1.3)	(.3)	(1.2)	(6.9)	(5.6)	7.1	(.3)
Typical "Wet" Year (1955-1956)														
River Flows	- base case	19.1	7.7	6.6	9.6	19.0	22.8	28.9	22.3	8.8	20.5	6.8	6.6	14.5
	- water budget	17.2	7.7	6.3	7.3	15.2	29.1	29.3	21.8	8.8	20.5	6.8	6.6	14.3
KCFS Difference 1/		(1.9)	(.0)	(.3)	(2.3)	(3.8)	6.3	.4	(.5)	0	0	0	0	(.2)

1/Parenthesis denotes water budget flows are less than base case flows.

SECTION 5. ENVIRONMENTAL IMPACTS OF ALTERNATIVES

5.1 No-Action Alternative. This alternative would continue existing (base case) method of project operation. The impacts on significant resources would not change. Water Budget recommendations to improve survival of juvenile salmonids in mid/lower Columbia River would not be implemented.

5.2 Council Water Budget Alternative.

a. Impacts On Fish.

(1) The reservoir fish populations and food chain organisms will be minimally affected, if at all, by the change in operation from the base case to the Council Water Budget operation. Generally, the schedule of operation needed to supply the Water Budget flows does not require the reservoir to be drafted as low as the base case condition except in late winter (table 1). The reservoir and its fishery is continuing to undergo long-term changes as the reservoir ages and the magnitude of the changes would not be modified by Water Budget flows.

(2) The river fish populations and biological productivity of the river is, for all practical purposes, controlled by the normal minimum flows of 4,000 c.f.s. (3,000 c.f.s. during spring refill approximately 30 percent of the time). These minimum flows were initiated after review of biological studies performed by Montana Department of Fish, Wildlife, and Parks (MDFWP) under contract with the Corps of Engineers. The minimum flows would not be expected to appreciably change between Council water budget flows and the base case flows. There will be differences in water discharge during certain months. However, the modified flow regime is not of such magnitude as to affect the biological productivity of the Kootenai River in Montana and Idaho. Accordingly, the Council Water Budget will have no significant impacts on the fish populations.

(3) The river recreational fishery is primarily aimed at taking of trout with considerably less emphasis on the underutilized whitefish and other species. Fishing occurs year round with most effort taking place in the summer months. The greater average river flows caused by the proposed Council Water Budget during the summer months (June and July) would have a slightly adverse influence in the recreational fishery.

(4) Studies conducted by MDFWP and coordination with the Libby Rod and Gun Club have resulted in a method of operation to maximize the fishability of the Kootenai River. This operational method is discussed in section 2. As shown in table 2, average monthly flows during June will increase from an average of 5,100 to 7,100 c.f.s. for Water Budget flows. During dry years, the average June flow could be expected to increase about 9,000 c.f.s. The July average flows can be expected to increase from 12,700 c.f.s. in base case to 13,200 c.f.s. for Water Budget flows. In dry years (1940-1941) the flow increase is greater - an increase of 3,000 to 9,000 c.f.s. The flows provided for the Water Budget are also greater in December and generally January and February. During flow releases in December, spilling sometimes

may be necessary. In other months, the flows for the Water Budget are less than for the base case operation. The recreational fishery in the Kootenai River occurs primarily from April through September, peaking during the summer. The practice of reducing flows to 8,000 c.f.s. to maximize the river fishability on weekends will continue whenever practicable. Obviously, this will increase the flow rate on weekdays. Fishing during the month of December would most likely be difficult because of the need to operate near or above full powerhouse capacity to discharge the required flows. Whenever practicable, the winter weekend flows during the best fishing period would be reduced to 8,000 c.f.s. to improve the fishability of the river. The overall fishing pressure and numbers of fish harvested from the river by the sport anglers under the Water Budget discharges from Libby project would, essentially, remain the same and no significant adverse impact upon the "fishability" of the river would be expected.

(5) The purpose of this alternative is to provide transportation water for seaward migrant salmon and steelhead. The release of the Council Water Budget at Libby project will aid in accomplishing this.

b. Impacts on Wildlife. The adoption of a Council Water Budget discharge at Libby Dam is not expected to have significant impacts on local wildlife populations. Changes in reservior and river elevations from base case conditions are not extensive enough to cause significant impacts.

c. Impacts on Endangered Species. Initiating the Council Water Budget flow release will generally result in lower river flows in November and greater flows in December, and possibly January-February (table 2). A portion of the bald eagle food source (i.e., stunned fish and waterfowl) may become less available to the eagles as a result of higher flows. However, although flows will be greater, an overall change in food supply is not expected; consequently, there will be no impacts on bald eagles. A biological assessment (BA) was sent to the U.S. Fish and Wildlife Service (FWS) for their review. The FWS concluded that the proposed changes would not adversely effect the bald eagle, prey species, or its habitat components.

d. Impacts to Cultural Resources. Operational change to accommodate the proposed Water Budget flows are not expected to impact cultural resources to any greater extent than existing operations practice. Erosion, a major threat to cultural resources, would continue to occur at approximately the same rate as with the base case operation. Therefore, significant cultural resources may be impacted by the proposed Water Budget flows to the same extent they are now adversely affected by existing project operations.

e. Water Quality. The reservoir water quality will remain unchanged by initiating the Council Water Budget flows. The required winter flows to be discharged from Libby Dam may necessitate some additional spill. Since the majority of the discharge at Libby Dam will be through the turbines, the nitrogen levels will remain at 110 percent or lower. Accordingly, no significant impacts on fish are expected.

f. Recreation. Much of the discussion on recreational fishing is contained in paragraph a. General recreation is expected to be unaffected by adoption of the Council Water Budget flow release schedule since reservoir elevations will change only slighty from base case operations.

g. Flood Control. The adoption of the Council Water Budget will not affect the flood control operation of the Libby Dam-Lake Koocanusa project. The reservoir elevations and downstream flows shown in tables 1 and 2 were calculated using the assumption that the project is operated in the interest of flood control.

5.3 Fish Agency Water Budget Alternative. The recommended Water Budget flows in the mid-Columbia River are the same as the flows recommended in the Council Water Budget. There are no significial adverse impacts on the environment as was noted in paragraph 5.2.

5.4 Tribal Water Budget Alternative. Modifying the operation of Libby project with the intent of providing the recommended Tribal Water Budget flows would require release of slightly greater volumes of water in most months than that required for the Council Water Budget. Although the flows are slightly greater, the environmental impacts of initiating the Tribal Water Budget will approximate the Council Water Budget impacts as noted in paragraph 5.2. The overall environmental impacts will not be significant.

SECTION 6. RELATIONSHIP OF THE ACCEPTABLE ALTERNATIVES TO ENVIRONMENTAL PROTECTION STATUTES

The relationship of the acceptable alternatives to environmental protection statute requirements is summarized in table 5.

TABLE 5

RELATIONSHIP OF THE ACCEPTABLE ALTERNATIVES
TO ENVIRONMENTAL PROTECTION STATUTES

Environmental Requirements	Compliance		
	No Action	Council Water Budget 1/	Tribal Water Budget
Archeological and Historical Preservation Act, 16 U.S.C. 469, et seq., as amended by PL 96-515, December 12, 1980.	Partial compliance 2/	(same)	(same)
Clean Air Act, as amended, 42 U.S.C. 7401, et seq.	Not applicable	(same)	(same)
Clean Water Act, as amended, 33 U.S.C. 1251, et seq.	Full compliance	(same)	(same)
Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451, et seq.	Not applicable	(same)	(same)
Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.	Full compliance	(same)	(same)
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not applicable	(same)	(same)
Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12, et seq.	Full compliance	(same)	(same)
Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.	Full compliance	(same)	(same)

1/Fish agency Water Budget recommendation has same impacts as the Council Water Budget.
2/A cultural resources survey of the Libby project area has been completed. A report will be submitted in August 1983 by Washington State University, which is under contract with Seattle District. This report will be a basis for Section 106 compliance with the Advisory Council on Historic Preservation. A change from existing method of operation to the proposed Water Budget operation will have no additional effect on cultural resources.

TABLE 5 (con.)

Environmental Requirements	Compliance		
	No Action	Council Water Budget 1/	Tribal Water Budget
Lar and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4, et seq.	Full compliance	(same)	(same)
Mar ne Protection, Research, and Sanctuary A t of 1972, as amended, 33 U.S.C. 1401, et seq.	Not applicable	(same)	(same)
N ional Historic Preservation Act of 1966, as amended, 16 U.S.C. 470, et seq. as amended by PL 96-515, 12 December 1980	Partial compliance 2/	(same)	(same)
National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, et seq.	Full Compliance	(same)	(same)
Rivers and Harbors Appropriation Act of 1899, as amended, 33 U.S.C., 401, et seq.	Full compliance	(same)	(same)
Watershed Protection and Flood Prevention Act, as amended, 16 U.S.C. 1001, et seq.	Not applicable	(same)	(same)
Wild and Scenic Rivers Act, as amended, 16 U.S.C., 1271, et seq.	Full compliance	(same)	(same)

1/Fish agency Water Budget recommendation has same impacts as the Council Water Budget.

2/A cultural resources survey of the Libby project area has been completed. A report will be submitted in August 1983 by Washington State University, which is under contract with Seattle District. This report will be a basis for Section 106 compliance with the Advisory Council on Historic Preservation. A change from existing method of operation to the proposed Water Budget operation will have no additional effect on cultural resources.

TABLE 5 (con.)

Environmental Requirements	Compliance		
	No Action	Council Water Budget 1/	Tribal Water Budget
Executive Order 11988, Flood Plain Management, 24 May 1977	Full compliance	(same)	(same)
Executive Order 11990, Protection of Wetlands, 24 May 1977	Full compliance	(same)	(same)
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 August 1976)	Full compliance	(same)	(same)

1/Fish agency Water Budget recommendation has same impacts as the Council Water Budget.

SECTION 7. COMMENTS AND RESPONSES

The draft EA, "Environmental Impacts Caused by Libby Dam-Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Pacific Northwest Power Planning Council," was transmitted for public review on 19 November 1982. Comments received in the 30-day public review period ending 21 December 1982 and Corps of Engineers response to the comments are contained on the following pages.

United States Department of the Interior
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY REFER TO PN 150
125.1

DEC 23 1982

Colonel Norman C. Hintz, District Engineer
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124

Dear Colonel Hintz:

The environmental assessment (EA) you provided titled "Environmental Impacts Caused by Libby Dam-Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Power Planning Council, Fisheries Agencies, and Indian Tribes" has been reviewed by appropriate members of our staff. The following comments are provided for your use in considering further NEPA compliance requirements.

General:

The EA does not cover the full range of impacts which will occur systemwide as a result of the decisions made on operations at Libby. Meeting the overall objectives of the water budget concept requires a complex interrelationship of all Columbia Basin storage facilities. Thus the operation of any one dam in the system can increase or decrease the impacts at other facilities within the system. The reviewer does not have the information to evaluate these impacts. For example, the fish flow requirements that the Montana Fish, Wildlife and Parks has proposed for Hungry Horse Project could cause the draft of Libby Project to be slightly greater during mid-October to mid-December when Hungry Horse outflow is restricted. Also, during March and April, the release at Libby Project in the water budget study should be increased to approach the base case to reduce the impact at Grand Coulee in May.

Even with the above changes, the operation of Libby Project would not be affected to any great extent. However, the very limited range of evaluation of a single dam does not provide a very clear picture for the public of the operational and environmental impacts of the long-term use of the water budget concept. The extent of the impact, if any, on irrigation, resident fisheries, power, etc., should be addressed. Such description does not lend itself easily to a reservoir by reservoir approach.

Response: A discussion of system-wide impacts and a reference to a system-wide study by the Bonneville Power Administration has been added to the repor

Response: Water budget flows will not impact the maximum second minimum elevations experienced at downstream projects. Further, the flows will not be outside the range which occurred prior to the water budget request. Accordingly, the impacts experienced downstream of the storage projects are not expected to change with water budget flows.

Specific:

Page 26, 5.1, No-Action Alternative--Under this assumption, the "water budget" will probably be physically released from Grand Coulee Dam/FDR Lake. The no-action alternative by the Corps would not necessarily preclude water budget implementation. The last sentence should be revised.

Thank you for the opportunity to review this document.

Sincerely yours,

L. W. Floyd

Regional Director

2

Response: The no-action alternative implies only that the existing (base case) operation of Libby project would continue as identified in existing EIS's prepared for this project. The assumption is that water budget recommendations would not be implemented either here or at any other downstream project.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FEDERAL BUILDING
P O BOX 7669
MISSOULA MONTANA 59807

1990

DEC 21 1982

Norman C. Hintz
Colonel, Corps of Engineers
Department of the Army, Seattle District
P.O. Box C-3755
Seattle, Washington 98124

Dear Colonel Hintz:

We have reviewed the Corps of Engineers' proposed Environmental Analysis (EA) for the Libby Dam-Lake Koocanusa Project proposed water budget and offer the following comments:

1. We agree with the Corps assessment of the water budget impacts on the fish and wildlife and power operation at the project.

2. The EA fails to assess any impacts to the developed recreation sites around the reservoir, recreation use of these sites, and the many cultural sites within the reservoir.

3. Our assessment of the drawdown and timing of the lower reservoir levels indicates the following impacts:

a. A 6 foot drawdown on the average year will expose 120 feet of beach and reduce the swimming areas at McGillivray and Rexford Campgrounds by 50 percent. Both are high/use areas. Our reports indicate 22,200 visitor days at McGillivray in 1982.

b. The boat tie up areas at Peck Gulch Campground would become marginally useable.

c. The reservoir area exposed by a 6 foot drawdown would be visually unattractive and a source of windblown particulates.

d. Late spring and summer drawdowns would also expose additional cultural sites for longer periods of time to vandalism and collectors.

Thank you for the opportunity to review and comment on this assessment.

James E Reid

JAMES E. REID
Director of Planning,
Programing, and Budgeting

Response: The assessment states that general recreation and cultural resources are not expected to be affected by adoption of the water budget. This is based on the assumption that during an average year water budget water levels will average only 2.8 feet less than those indicated by the base case. During the months of June, July, and August, the difference is less than 1 foot.

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: SJ

December 17, 1982

Colonel Norman C. Hintz
District Engineer
U.S. Army Engineer District, Seattle
Attn: NPSEN-PL-ER
P.O. Box C-3755
Seattle, Washington 98124

Dear Colonel Hintz:

Thank you for the opportunity to review and comment on your environmental assessment (EA) of the impacts on the Libby Dam - Lake Koocanusa Project from releasing water budget flows. Bonneville Power Administration (BPA) recognizes that the document is project specific and does not address systemwide non-power impacts from implementing the Power Planning Council's Water Budget. Therefore, we have no substantive comments to add related to the singular project-specific nature of the document.

In response to our own National Environmental Policy Act responsibilities, BPA has initiated an internal review of systemwide changes to the power supply system in order to determine any environmental consequences of program implementation. We will keep you informed of the progress of this review.

Sincerely,

Anthony R. Morrell
Environmental Manager

Response: Acknowledged.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Billings Office
316 North 26th Street
Billings, Montana 59101-1396

IN REPLY REFER TO:

December 8, 1982

Mr. Dwain F. Hogan
Chief, Planning Branch
Department of the Army
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, Washington 98124

Dear Mr. Hogan:

We have reviewed your biological assessment evaluating the possible effects on the endangered bald eagle of proposed changes in the operation of Libby Dam recommended by the Pacific Northwest Power Planning and Conservation Council. We concur with your conclusion that the proposed changes will not affect the bald eagle. Changes in the availability of prey items and habitat components for the eagle are not expected to be at a level that would result in adverse effects to the eagle. Thus, formal section 7 consultation is not required. There are no additional listed species in the project area requiring evaluation in your assessment.

Thank you for your cooperation and assistance in meeting our joint responsibilities under the Endangered Species Act.

Sincerely,

for Wayne G. Brewster
Field Supervisor
Endangered Species

cc: Ecological Services, USFWS, Billings, MT

33

Response: Concurrence with conclusions concerning the effect of the proposed operational changes on the bald eagle, prey species, and other habitat components is noted.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Ecological Services
Federal Building, Room 3035
316 North 26th Street
Billings, Montana 59101-1396

IN REPLY REFER TO:

ES

December 15, 1982

Mr. Jack Thompson
Seattle District, Corps of Engineers
P.O. Box c-3755
Seattle, Washington 98124

Dear Mr. Thompson:

This letter is in response to your request for review of the preliminary finding of no significant impact (FONSI), and draft environmental assessment entitled "Environmental Impacts Caused by Libby Dam - Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Power Planning Council, Fisheries Agencies, and Indian Tribes".

The Fish and Wildlife Service has concurred, by letter dated December 8, 1982, with your biological assessment evaluating potential effects of operational changes at Libby Dam on the endangered bald eagle.

We have consulted with the Montana Department of Fish, Wildlife, and Parks and our Boise, Idaho office and have concluded that none of the proposed alternatives would have a significant adverse impact to fish and wildlife resources.

Thank you for providing us this opportunity to review a draft environmental assessment.

Sincerely,

Dennis M. Christopherson
Acting Field Supervisor
Ecological Services

cc: Regional Office, USFWS, Denver, CO (ENV)
Paul Burke, USFWS, Washington D.C., OEC
Director, Montana Department of Fish, Wildlife, and Parks, Helena, MT
Jim Vashro, Montana Department of Fish, Wildlife, and Parks, Kalispell, MT
Ray Heberger, USFWS, Boise, ID (ES)

Response: The conclusion that none of the proposed alternatives would have a significant adverse impact on fish and wildlife resources is noted.

STATE OF MONTANA

DEPARTMENT OF
FISH AND GAME
P. O. Box 67
Kalispell, Montana 59901
December 14, 1982

Norman C. Hintz, Colonel
Corps of Engineers
District Engineer
Seattle District
P. O. Box C-3755
Seattle, Washington 98124

Dear Mr. Hintz:

The following are comments on the preliminary findings of no significant impact (FNSI), and draft environmental assessment entitled, "Environmental Impacts Caused by Libby Dam-Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Power Planning Council, Fisheries Agencies, and Indian Tribes".

In general, we support your findings of no significant impact. There were some omissions of potential impacts in Section 5 and a need to clarify or correct several statements in Section 3.

Section 3.3 b

First sentence states river downstream from dam developed an excellent rainbow trout fishery. This should be qualified to say the river downstream to area around Kootenai Falls developed an excellent rainbow fishery. The fishery in downstream areas is primarily limited by recruitment.

Second sentence infers that all the changes in the fishery can be attributed to Libby Dam. Several factors should be used to qualify this including: 1) there was a species shift from a cutthroat to a rainbow trout fishery and use of the words far superior tends to exaggerate the change from pre- to post-dam conditions. Although the river is now rated Class I the reach upstream from Libby was given the state's second highest rating prior to construction. 2) Pollution problems in Canada and in the U.S. portion of the Kootenai River drainage were also corrected about the time of construction of Libby Dam which undoubtedly played a role in improving the river fisheries.

The third sentence starts "In recent years, a large, but underutilized, whitefish population has developed..." This statement fails to mention that the first three years following construction of Libby Dam produced severe gas supersaturation problems in the river which caused significant declines in numbers of whitefish. It was only after the gas supersaturation problems were resolved that the whitefish population attained its present size.

Response: The assessment has been modified to reflect these comments.

Section 3.3 c

Third sentence should read ...rainbow have tended to dominate the reservoir game fish populations. Kokanee from an unidentified introduction, probably a Canadian hatchery, have increased the numbers in recent years and now make up a significant part of the fisherman's catch.

These fish will undoubtedly change the biological balance in the reservoir and will require a reassessment of fishery management and possibly reservoir operation.

Response: The text has been revised to include this comment.

Section 3.4 Wildlife

a. There is no discussion of the negative impacts caused on wildlife by construction of the dam nor the lack of adequate mitigation for these losses. This assessment generally highlights benefits and ignores impacts.

Response: The text has been revised to include this comment.

Section 5

As mentioned earlier, there is little mention of gas supersaturation problems. The water budget would tend to increase chances of supersaturation due to discharge in excess of plant capacity in December, January, and February.

Impacts on fishing opportunity, as a result of higher flows in June and July, will probably have to be monitored through observation of daily operations. Monthly averages are of only limited value in that assessment.

Response: Water budget discharges in excess of plant capacity would be a problem should gas concentrations exceed 110 percent. The project is at present and will continue to be operated to minimize this occurrence and create insofar as possible ideal conditions for fish. Oxygen subsaturation occurs seasonally during the fall drawdown and methods of reducing the incidence are being explored.

There is no mention of the recently observed oxygen subsaturation found in the river and its effects on biota in the river.

The timeliness of preparation of this document, its readability and brevity are to be commended. Based on the information presented, we would concur that there is no significant impact based on the available operation data. We want to continue monitoring operation of the project on an annual basis to assess potential impacts in the river and reservoir.

Sincerely,

Patrick Graham
Northwest Power Coordinator

PG/bjm
cc: R. Marcoux
A. Whitney
T. Bay
J. Vashro
R. Weckworth

JOHN SPELLMAN
Governor

FRANK LOCKARD
Director

STATE OF WASHINGTON
DEPARTMENT OF GAME
600 North Capitol Way, GJ-11 • Olympia, Washington 98504 • (206) 753-5700

December 8, 1982

Colonel Norman C. Hintz
Corps of Engineers
Post Office Box C-3755
Seattle, Washington 98124

DRAFT ENVIRONMENTAL ASSESSMENT:
Environmental Impacts Caused by
Libby Dam-Lake Koocanusa Project
Releasing Water Budget Flows
Recommended by the Northwest Power
Planning Council, Fisheries
Agencies, and Indian Tribes

Dear Colonel Hintz:

Your document has been reviewed by our staff as requested; comments follow.

We do not agree that there will be no impact on wildlife from the proposed water budget releases as stated in this draft environmental assessment. Without mitigating measures, there is a real potential for adverse impacts to waterfowl and furbearers downstream in the Columbia River. Many waterfowl and furbearers will have begun nesting and denning activities prior to the initial releases starting April 15. High downstream flows could result in waterfowl abandoning nests and furbearers drowning in dens. To avoid these problems, we suggest that beginning March 1 projected high flows be achieved two to three times per week during daylight hours. This would accustom animals to higher flows and allow them to choose nesting and denning sites at safe elevations.

Response: Wildlife impacts at downstream Columbia River projects were no originally intended to be within the scope of this assessment. The docum has been modified to clarify that the impact analysis refers only to "loc wildlife populations.

Thank you for the opportunity to review this document. We hope you find these comments helpful.

Sincerely,

THE DEPARTMENT OF GAME

Mark Grandstaff

Mark H. Grandstaff, Applied Ecologist
Environmental Affairs Program
Habitat Management Division

MHG:cv
cc: Agencies

MONTANA HISTORICAL SOCIETY
HISTORIC PRESERVATION OFFICE
225 NORTH ROBERTS STREET • (406) 449-4584 • HELENA, MONTANA 59601

November 24, 1982

Colonel Norman C. Hintz
District Engineer
U.S. Department of the Army
Seattle District, Corps of Engineers
P.O. Box C-3755
Seattle, WA 98124

Dear Colonel Hintz:

RE: Environmental Impacts caused by Libby Dam-Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Planning Council, Fisheries Agencies, and Indian Tribes.

Thank you for the opportunity to review the above-named proposed undertaking. I concur with your finding that cultural resources will not be affected by this proposed undertaking. I note that erosion would continue at approximately the same rate as with base case operation.

Sincerely,

Marcella Sherfy
Marcella Sherfy
Deputy SHPO

TAF:md

Response: A cultural resources management plan which will identify erosion impacts caused by operations and which will make recommendations for site mitigation is in preparation.

THE WASHINGTON WATER POWER COMPANY

Electric and Natural Gas Service

P O BOX 3727 • SPOKANE, WASHINGTON 99220 • (509) 489 0500

FRED A. SHIOSAKI
MANAGER
ENVIRONMENTAL AFFAIRS

December 22, 1982

Colonel Norman C. Hintz
Department of the Army
Seattle District, Corps of Engineers
P. O. Box C-3755
Seattle, WA 98124

Dear Colonel Hintz:

The following are comments by The Washington Water Power Company on the November 19, 1982 Environmental Assessment and draft Finding of No Significant Impact for implementing the water budget flows at the Libby project. Our concerns are primarily with the procedural direction taken by the Corps of Engineers in the preparation of the Environmental Assessment and the development of the finding of non-significance. By limiting the assessment to the project-specific, non-power impacts, the full significance of the alternatives for augmenting instream flows has not been evaluated. It may be that at some level of flow augmentation, non-power impacts will be insignificant at the Libby project. However, a contribution of flows from the Libby project, coupled with other actions intended to achieve a larger regional goal of instream flows, will likely have significant direct, indirect, and cumulative power and non-power impacts. Impacts on future resource uses and the environment may also be compounded by the need for additional capacity to replace the Libby increment of the calculated 550-mw regional loss of firm power.

Considering the interdependence of the proposed action at Libby with a regional action, it appears the scope of the assessment must be enlarged to fully comply with the National Environmental Policy Act. Implementation of such a major management action which would alter project operations and have significant economic consequences requires a more complete assessment which addresses the incremental impact of the proposed alternatives to the regional system. Any findings which result from the assessment as it is now written can only be considered partial compliance with the National Environmental Policy Act because of the limited scope of impact analysis. If the scope of this assessment is not enlarged, the final documents should state the perceived process as to how such a limited assessment and finding may be used in evaluating the overall significance of the alternative actions to the power and non-power values of the regional system.

Response: The purpose of this assessment is to identify nonpower impacts of providing a quantity of water from Libby project to assist in meeting a target flow at Priest Rapids Dam. To connect this assessment to a systems analysis would obfuscate the specific project analysis that we consider critical to determine whether our existing project EIS requires supplementing or whether a FONSI can be prepared. Regional power losses are being addressed by BPA.

Response: We do not concur that this assessment is in only partial compliance with NEPA.

Comments specific to the content of the Environmental Assessment (EA) are provided in the following paragraphs.

Section I:

It should be made clear that the purpose of the specific action evaluated by this assessment is to contribute in part to a regional objective (EA page 1).

In recognizing power impacts (EA page 3), the EA should also acknowledge that other non-power impacts may occur as a result of replacing lost power capacity by other means.

Section II:

The EA should address other aspects of the Regional Power Council's fish and wildlife plan applicable to Libby project operations. For example, the conditions of Council recommendations 804(a)(7) may be fulfilled by the existing minimum discharge criteria discussed on EA page 6.

Section IV:

The no action alternative description implies that if Libby operations aren't changed, flows below Priest Rapids would also not change. This statement is incorrect as it does not consider possible changes at other storage projects (most notably, Grand Coulee) which may affect flows below Priest Rapids.

The EA is based on some assumed apportionment of water volume which would be required from the Libby project to help provide the proposed instream flows. To what extent, if any, inflow contributions from downstream sources were included in the calculation of apportionment is not indicated. These presumed release volumes should be defined so that the reasonableness and accuracy of the draft EA can be reviewed.

The proposed change in Libby project operations would contribute substantially, but not entirely, to a calculated system loss of 550 megawatts due to the entire water budget (EA page 3). Alternatives of system coordination to minimize the resulting power production losses at Libby and downstream projects should (1) be considered within the framework of the stated purpose for action and (2) maintain consistency with Section 4(h)(6)(C) of the Regional Power Act (P.L. 96-501). The alternatives should also account for other recommendations of the Council's plan. For example, recommendation 804(b)(1)(A) of the Council's fish and wildlife plan calls for a drawdown restriction on the Libby project reservoir of 90 to 110 feet. Additionally, recommendations 804(b)(1)(C) and 804(b)(3) call for development of better defined operational criteria to protect fishery resources from apparently existing drawdown impacts. These recommendations should be discussed as they relate to the evaluated alternatives, their feasibility in consideration of other recommendations and existing restrictions, and finally the determination of impact significance.

Response: The text has been revised to include this comment.

Response: Nonpower impacts resulting from the replacement of lost power production capacity are not considered to be significant at the present time because of the surplus power supply. This surplus negates the need to develop new sources of power at this time.

Response: The existing minimum operational criteria for Libby project is for all practical purposes identical to council recommendation 804(2(7) and would have little, if any, effect upon the water budget alternatives.

Response: The no-action alternative implies only that there would be no change in the existing (base case) operation of Libby project and that water budget recommendations would not be implemented.

Response: The volume of water released by month under base case and water budget conditions can be found in table 4 of the EA.

Response: There are undoubtedly a number of alternative methods of accomplishing the objectives of the Regional Power Act and the specific recommendation developed by the council under the various provisions of the act. Again, this EA addresses only the environmental impacts of the Libby Dam water budget and demonstrates that the budget has little, if any, impact.

Section 5:

The EA does not report the results of early consultations and coordination with state or federal fish and wildlife resource agencies concerning the non-power impacts of the proposed alternative actions. A discussion of such coordination is required in the EA as provided in 33 CFR 230.25(a)(8) and should be provided for consideration during public review.

Response: A paragraph detailing Corps of Engineers' coordination with Federal, state, and private agencies has been added to the assessment.

Section 6:

Footnote 2 of Table 5 states full NEPA compliance may be accomplished upon finalization of the EA. Considering the interdependency of the proposed action within the framework of a regional goal and the limited scope of the assessment, it appears that, without further evaluation, compliance with the National Environmental Policy Act (NEPA) would only be partial with these documents.

Response: The scope of this EA covers Libby Dam project. System-wide power and marketing impacts are being addressed by Bonneville Power Administration. A summary of BPA system-wide impacts has been added to this assessment.

In summary, the procedural direction taken with this Environmental Assessment is of concern because of the limited scope of impacts which were addressed. The limitation results in an assessment which only partially fulfills NEPA requirements. The final documents should state this limitation and explain the process by which full compliance will be achieved.

Environmental Assessments require brief discussions of the significant effects of action alternatives, including impacts which are direct, indirect, and cumulative. These terms, which are all well defined in 40 CFR 1508.7, 1508.8, 1508.9, and 1508.27, served as reference for the above comments. Title 33 CFR 230.6(d), 230.7(c) and Appendix B(8) of 33 CFR 230 also served as reference for these comments.

Thank you for the opportunity to provide these comments.

Sincerely,

Fred A. Shiosaki
Manager, Environmental Affairs

RDW:wpc

cc: Executive Department
G. Prekeges
F. Pickett - MPCo.
M. Schultz - ICP
A. Wright - PNUCC (F&W Comm.)

PNUCC

PACIFIC NORTHWEST UTILITIES CONFERENCE COMMITTEE

December 30, 1982

Colonel Norman C. Hintz
Department of the Army
Seattle District, Corps of Engineers
P. O. Box C-3755
Seattle, WA 98124

Dear Colonel Hintz:

We have reviewed your draft Environmental Assessment entitled "Environmental Impacts caused by Libby Dam - Lake Koocanusa Project Releasing Water Budget Flows Recommended by the Northwest Power Planning Council, Fisheries Agencies, and Indian Tribes." Our comments are as follows:

Reference: Page 3, Paragraph "e"

The last sentence of the paragraph states "This environmental assessment does not address system-wide power or rate impacts."

The PNUCC feels that there are significant system-wide power and rate impacts that will be caused by implementation of the water budget which should be addressed by the assessment.

In particular, we feel some explanation of how the 550 average megawatts of firm energy load carrying capability will be replaced should be addressed in the assessment.

If these impacts are not addressed then reasoning should be supplied to describe why they are not.

Response: Identification of power system and marketing impacts is a responsibility of Bonneville Power Administration and these concerns are being addressed by that agency in a separate assessment.

General Comments:

Several significant improvements and benefits to the resident fishery are identified in the assessment. These should be brought to the attention of both the Regional Power Council and the Bonneville Power Administration and taken into mitigation account during implementation of the Fish and Wildlife Program.

Response: Construction of the Libby Dam improved fishing area over preimpoundment conditions. No additional improvement or benefit would be anticipated through adoption of the water budget.

We appreciate the opportunity to comment on the draft environmental assessment.

Sincerely,

Rich Nassief
Deputy Director

RN/jr:104M

PNUCC · 520 SW SIXTH AVENUE, SUITE 505 PORTLAND, OR 97204 · (503) 223-9343

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the
Regional Director

Region VIII
Federal Office Building
1961 Stout Street
Denver CO 80294

ROFEC

December 30, 1982

Colonel Norman C. Hintz, C. E.
District Engineer
U. S. Army Engineer, Sacramento District
650 Capitol Mall
Sacramento, California 95814

Dear Colonel Hintz:

We have reviewed the Draft Environmental Assessment for the Libby Dam - Lake Koocanusa Project and conclude that this project would have no impact on social services agencies in northwestern Montana.

Sincerely yours,

E. W. McIntire
Director, ROFEC

Response: Acknowledged.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
847 NE 19th AVENUE SUITE 350
PORTLAND, OREGON 97232
(503) 230 5400

December 21, 1982 F/NWR5:BJB

Colonel Norman C. Hintz
U.S. Army Engineer District, Seattle
P.O. Box C-3755
Seattle, Washington 98124

ATTN: NPWPL-ER

Dear Colonel Hintz:

The National Marine Fisheries Service (NMFS) has reviewed the draft environmental assessment (EA) on the nonpower impacts on Libby Dam - Lake Koocanusa Project as that project is used to provide water for the Water Budget Concept. In accordance with your request dated November 19, 1982, our comments follow:

General Comments

The intent of the Northwest Power Planning Council's (hereinafter the Council) Water Budget is to partially reduce an existing, highly significant impact of the Columbia Basin Hydroelectric System on anadromous salmonids. Our primary concern is the immediate need for flows to protect salmon and steelhead stocks in the Columbia River Basin. In the fish and wildlife agencies' and tribes' recommendations to the Council, upon which the Water Budget is based, we documented survival rates for migrating juvenile salmon and steelhead, to the lower river, of less than 5 percent in low water years.

The urgency of remedial measures to offset the impact of the Columbia River Hydroelectric System is evidenced in the Northwest Electric Power Planning and Conservation Act by the mandate to develop and adopt the fish and wildlife program, prior to the development or review of the regional power plan. Congress further recognized the need for this specific measure by including the provision that the program contain measures which will, "in the case of anadromous fish - provide flows of sufficient quality and quantity between (hydroelectric) facilities to improve production, migration and survival..."

In the event that the response to this draft EA by parties knowledgeable of and/or responsible for the affected environment in and around Libby Dam - Lake Koocanusa Project, does not permit a finding of no significant impact (FONSI), we propose that an interim FONSI be made for a period of two years, while a full environmental impact statement is prepared. We believe that we are justified in this proposal due to, (1) the significance of the beneficial impact on anadromous fish survival (or conversely, the detrimental impact of the no-action alternative), (2) the remedial nature of the action, and (3) the lack of any identified irretrievable damage that would occur with implementation over a two-year period.

Specific Comments:

Section 1. Introduction

1.1. Purpose of Action

This section should be amended to more accurately reflect the purpose of the improved flows, and to include recognition that the Corps under the provisions of Section 4(h)(11)(A) has an obligation to implement the Water Budget to the "fullest extent practicable" and must provide "equitable treatment" of fish and wildlife with other project purposes at Libby Dam.

To incorporate these comments, we recommend that the section read as follows:

> "This environmental assessment evaluates the nonpower environmental impacts that could occur from modifying the operation of Libby Dam - Lake Koocanusa project to provide transportation flows or "Water Budget" as adopted by the Northwest Power Planning Council. Flows recommended by the fisheries agencies and tribes are evaluated as alternatives. It is the obligation of the Corps under the provisions of the Northwest Power Act to take the Council's program into account to the fullest extent practicable and to provide equitable treatment of fish and wildlife with other project purposes at Libby Dam. The 'Water Budget' is a major component of that program. The objective of the 'Water Budget' is to improve the survival of juvenile salmon and steelhead in their spring migration to the lower river. The purpose is to partially mitigate a severe adverse impact of the operation of the Columbia River hydroelectric system on upriver salmon and steelhad runs, namely, the delay, increased mortality and residualism to these stocks that results from (1) the storage of spring runoff to accommodate peak seasonal electric power demand, and (2) the reduced velocities through reservoirs because of the greatly increased cross sectional area."

Response: The draft assessment has been revised, in part, as suggested.

1.2 Background

We recommend an additional subsection to this section to reflect the value and the current status of the upper Columbia Basin anadromous fish runs.

> "Salmon and steelhead resources in the Columbia and Snake Rivers have historical, social and biological importance to the citizens of the Pacific Northwest. In addition, these resources contribute to valuable commercial, recreational and Indian treaty fisheries, for an estimated annual contribution of approximately $141 million per year.
>
> Unfortunately, salmon and steelhead resources have suffered with the development of the Pacific Northwest. Development on and along the Columbia and Snake Rivers, including federal and non-federal water and power projects, have taken a serious toll in lost fish habitat and in continuing fish mortalities. Some runs have been eliminated, while others such as upriver spring and summer chinook salmon are in a critically depressed state. As a result of these declines, regional, national and international ocean fisheries are suffering serious financial setbacks; inriver fisheries have been closed; and harvest management has become an increasingly complicated and difficult process."

Response: The history of the Columbia River and the decline of its fishery has been adequately covered in other publications.

Section 4. Alternatives

The action alternatives discussed in this section are for three different transportation flows, or water budgets. While this is good, there should also be discussions of alternative operating modes to meet the water budget adopted by the Council. As this section is now written, Alternative 4.2 is the only one to consider implementation of the water budget adopted by the Council. This alternative assumes that flows at Libby Dam will be reduced during the spring migration to "balance power needs," and that releases from Libby will be made prior to and immediately after the releases from Grand Coulee needed to meet fish flows. While we have no objection to this alternative, it is not clear, where the impacts of providing fish flows leave off and the impacts of balancing power needs begin. In any event, since the Council's program does not specify how reservoirs should be operated to meet the water budget, a discussion of alternative operating modes is appropriate.

Response: Numerous operating modes and alternative methods of implementing the Council's water budget were considered during the early stages of study development. Most of the alternatives were eliminated from further consideration due to their adverse effects.

Section 5. Environmental Impacts of Alternatives

This section should be expanded to include the impact of the various alternative modes of reservoir operations on anadromous fisheries. In particular, comparisons should be made on the detrimental impact of the no-action alternative on juvenile salmon and steelhead migrant survival and the improvements in survival associated with alternatives that achieve the flow objective. For example, based on hydroregulation studies conducted by the Interagency Instream Flow Work Group for the base case (85 G) and operation to meet recommended fish flows using Grand Coulee, Dworshak and Brownlee (85 K), we have estimated an improvement in survival per project from 71 percent to 77 percent with the implementation of fish flows.[1/] Considering the cumulative impact of passing eight dams, this would result in an overall increase in survival to the lower river of 90 percent.

Response: System-wide alternatives and their impacts are not within the scope of the present assessment.

Sincerely,

Dale R. Evans

Dale R. Evans
Division Chief

1/ Ceballos, J.R. "Impact of Incremental levels of riverflow on Snake and Columbia River Juvenile Fish Survival. NMFS working paper. May, 1982. p.8.

cc: CBFWC
Curt Marshall (PPC)

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

OEPR-DEA

DEC 15 1982

Colonel Norman C. Hintz
District Engineer
U.S. Army Corps of Engineers
Seattle District
P.O. Box C-3755
Seattle, Washington 98124

Dear Colonel Hintz:

This is in reply to your letter to Chairman Butler, dated November 19, 1982, requesting comments on the draft environmental assessment (EA) of the non-power impacts associated with the operation of the U.S. Army Corps of Engineers (Corps) Libby Dam - Lake Koocanusa Project as part of the water budget program proposed by the Northwest Electric Power Planning and Conservation Council (Council).

The Commission staff has reviewed the EA and has the following general comments.

The EA focuses only on the non-power impacts of the water budget program on the Libby Dam Project, however, power impacts of the proposed Libby Dam Project operation may be substantially greater than those discussed. Additionally, the impacts related to Libby Dam represent only a portion of the total impacts related to the water budget concept, as proposed by the Council.

Because of the significant regional effects of the proposed water budget concept, which involve several major hydroelectric projects and other facilities, an environmental impact statement (EIS) should be prepared. The EIS should include the total impacts of the water budget on all projects, both power and non-power. A project-by-project approach does not allow an adequate understanding by the reviewer.

Specific comments on the EA are as follows:

(1) Although the EA stated that 550 megawatts of firm power would be lost and other adverse impacts would be realized, it did not quantify the projected benefits. It would appear that quantification of benefits must be provided before such power capacity is precluded from operation.

Response: A section on power impacts summarizing the Bonneville Power Administration's EA, "Proposed Power System Changes to Implement the Water Budget," has been incorporated into this assessment.

(2) The EA should consider or discuss the region-wide environmental and socioeconomic impacts of replacing from other sources the 550 MW of firm power capacity that would be lost by implementation of the proposed water budget program.

Thank you for the opportunity to comment on the draft EA for the Libby Dam - Lake Koocanusa Project.

Sincerely,

Lawrence R. Anderson

Lawrence R. Anderson
Director, Office of Electric
Power Regulation

SECTION 8. APPENDIX

8.1 Water Budget Impacts on Power Production. Although this assessment was prepared to discuss the nonpower impacts of implementing the water budget at Libby Dam-Lake Koocanusa project, the following discussion on power impacts, as summarized from Bonneville Power Administration's (BPA) EA, "Proposed Power System Changes to Implement the Water Budget," is provided to permit a better picture of the impacts resulting from implementing the Water Budget. Copies of this EA (DOE/EA-0214) can be obtained from the BPA Office of Power and Resources Management, Portland, Oregon.

In order to study the power impacts of the Water Budget, the energy content curves were raised to maintain a high probability of reservoir refill and still provide Water Budget flows. This resulted in system storage being higher beginning in the fall and continuing until the start of the Water Budget flow period. Therefore, accommodation of the Water Budget requires reshaping of system storage through modification of energy content curves. This results in a loss of about 500 average MW of firm energy producing capability.

The primary loss of FELCC is from the transfer of water from firm energy production to providing flows for fish. Other factors that may enter into the loss of FELCC are head loss during second and later years of the critical period and greater potential for spill arising from changes to energy content curves and provision of Water Budget flows.

Providing Water Budget flows results in a reduction in the firm energy producing capabilities of the region's hydroelectric system. This increases the system's ability to generate nonfirm energy. Therefore, most markets will have increased accessibility to nonfirm energy. Potential operational impacts are: increased service from nonfirm energy to the direct service industry's top quartile load, displacement of thermal generating facilities, and increases of energy exports. However, this does not represent a real change under the current surplus situation since these loads would likely have been served from surplus firm energy which has been converted by the Water Budget to nonfirm energy.

The hydrosystem has been developed with peaking reserves to account for forced outages, unanticipated loads, and hydrosystem maintenance. Hydropeaking capability should not be significantly affected by providing Water Budget flows. Some third party transmission agreements may, however, be necessary under certain circumstances to insure adequate transmission of peak energy, depending upon the geographical location of the peak need at a given time.

Hydroregulation studies show that there is one additional year out of 40 where system refill does not achieve the desired 98 percent of full storage content. This means that the probability of providing advance energy or FELCC shift is reduced by a maximum 2.5 percent for any given year. The operational impact is a loss in system flexibility.

Following low runoff years, the system will begin the operating year with lower reservoirs. This can impact the amount of firm load which can be met during the operating year and will slightly increase the chance of drafting the system empty.

The implementation of mitigating measures could lessen Water Budget impacts on the system's flexibility in production of firm energy. One measure, shifting thermal plant maintenance to April-June period, has already been done to a large extent. The use of westside storage and generating capabilities to lessen operational impacts is dependent upon the degree to which existing westside operation constraints will allow participation. The use of British Columbia hydrosystem is being explored but is constrained by terms and procedures of the Columbia River Treaty. Two future mitigation measures, resource acquisition and flood control adjustments, are for the most part beyond the scope of this document. Acquisition of future generating resources would come at a time when forecasts indicated a need for such acquisition and is dealt with as part of the Council's energy plan.

8.2 Marketing Impact. The identification of power system marketing impacts of implementing the Water Budget is a responsibility of BPA. That agency's referenced EA addresses that issue and marketing impacts will not be discussed in this EA.

DOE/EA - 0310

Environmental Assessment

UMATILLA FISH HATCHERY

Office of Power and Resources Management
BONNEVILLE POWER ADMINISTRATION

February 1987

Environmental Assessment

UMATILLA FISH HATCHERY

Office of Power and Resources Management
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

February 1987

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Chapter 1

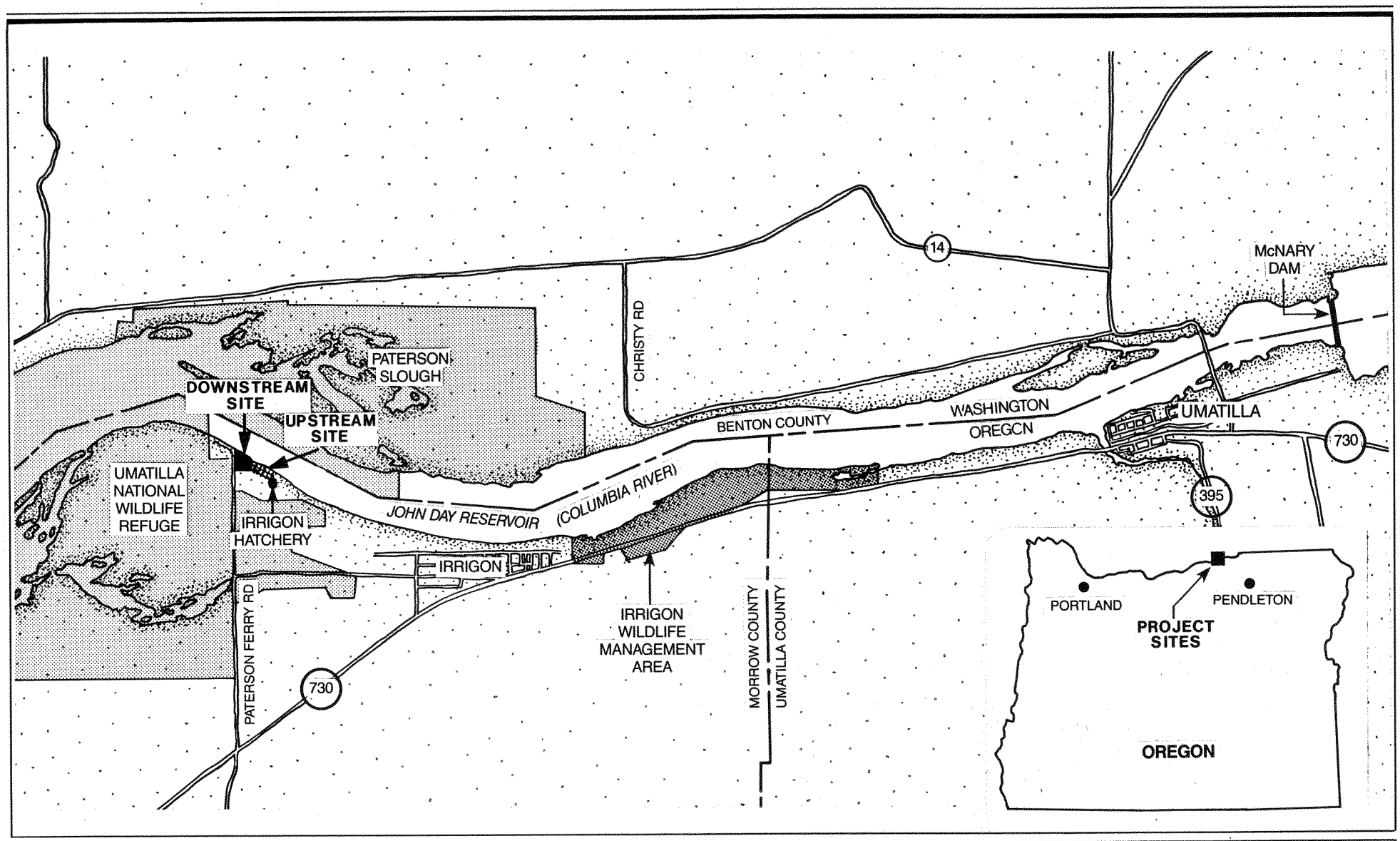
PROPOSAL AND BACKGROUND

1.1 DESCRIPTION OF THE PROPOSED ACTION

Bonneville Power Administration (BPA) proposes to fund construction and operation of a Umatilla anadromous fish hatchery. Planning for this hatchery started with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the Oregon Department of Fish and Wildlife (ODF&W) submitting a recommendation to the Northwest Power Planning Council (NWPPC), identifying the need to enhance the depleted summer steelhead population within the Umatilla River basin. Subsequently, staff of the NWPPC sponsored an amendment to the original Fish and Wildlife Program calling for development of the Umatilla Fish Hatchery. This amendment was adopted and included as Measure 704(i)(1) of the 1984 Columbia River Basin Fish and Wildlife Program (NWPPC 1984). BPA, with the authority to address measures and associated action items of the Fish and Wildlife Program, initiated work to locate, design, and construct the Umatilla Fish Hatchery. As a result, BPA has identified two adjacent sites on the Columbia River near Irrigon, Oregon, with the upstream site being considered the preferred location for the Umatilla Fish Hatchery (Figure 1). The Federal Government owns and the Portland District of the U.S. Army Corps of Engineers (Corps) administers the proposed hatchery sites. The Corps has agreed to provide BPA with a special use permit for either site. The Walla Walla District of the Corps is preparing the preliminary and final design plans for the hatchery. BPA will fund construction, operation, and maintenance of the hatchery and ODF&W will operate and manage the facility. Due to their extensive involvement in development of this project, ODF&W, CTUIR, and the Corps have cooperated with BPA in preparation of this document.

The initially proposed Umatilla Fish Hatchery, as described in measure 704(i)(1) of the 1984 Fish and Wildlife Program, would produce 40,000 pounds of summer steelhead smolts (200,000 smolts at 5 fish per pound) for release in the upper Umatilla system. These hatchery-reared steelhead smolts would be transported to the Bonifer and Minthorn Springs acclimation facilities for final rearing, acclimation, and release (Figure 2). The juvenile acclimation and adult holding facilities, located within reservation boundaries, are currently operational, and managed by the CTUIR. The release of 40,000 pounds of steelhead smolts would result in an estimated annual return to the Umatilla River of 5,400 adult fish (Boyce 1986).

The NWPPC is presently considering an ODF&W- and CTUIR-proposed amendment to the 1986 Columbia River Basin Fish and Wildlife Program which recommends that the Umatilla Fish Hatchery designs be expanded for four times the production of measure 704(i)(1) described above. This proposal suggests that the hatchery produce the initially proposed 40,000 pounds of steelhead smolts <u>and</u> 120,000 pounds of chinook salmon smolts annually. The initial focus of the



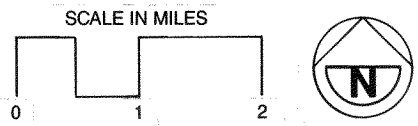
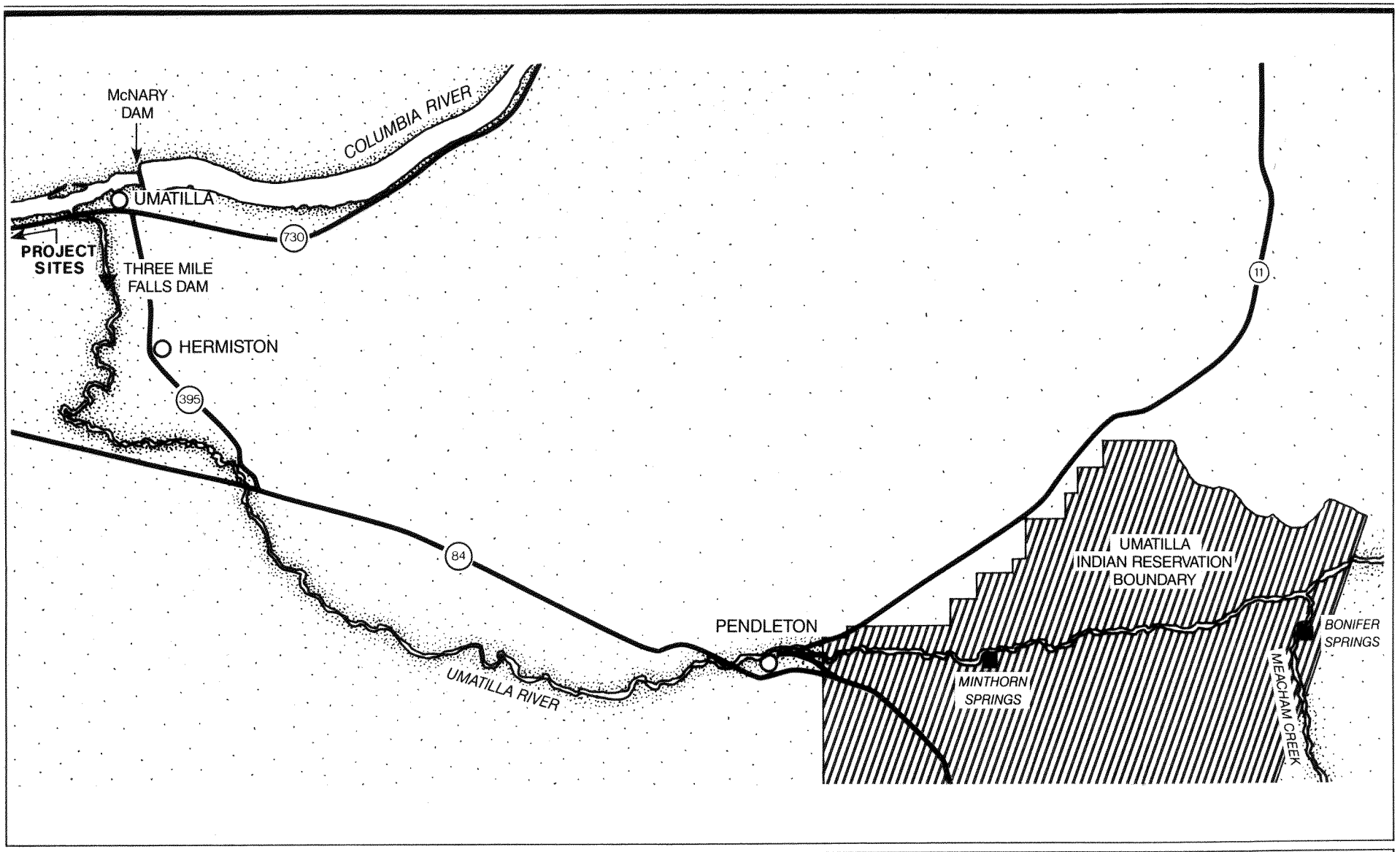


Figure #1.
Location of the proposed BPA Umatilla Fish Hatchery, near Irrigon, Oregon.



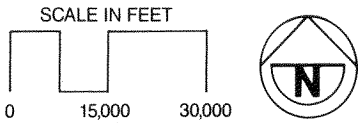


Figure 2.
Location of Three Mile Falls Dam, Minthorn Springs and Bonifer Springs; Umatilla River System, Oregon.

expanded facilities would be on production of spring and fall chinook. Under this proposal, some of the hatchery-reared spring and fall chinook smolts would be transported to the Bonifer and Minthorn Springs acclimation facilities for final rearing, acclimation, and release. Others may be outplanted in the habitat to supplement natural production. This will be detailed in the master production plan. The release of 120,000 pounds of spring and fall chinook smolts would result in an estimated annual return to the Umatilla River of 7500 adult fish (Boyce, 1986).

So that BPA could implement the proposal described above, this document addresses the environmental impacts of the hatchery expansion alternative. It is possible that numbers and species of fish produced could change through a future cooperative ODF&W/CTUIR hatchery master planning process. However, the environmental impacts of an expanded hatchery are expected to be basically the same as described in this document.

The master plan mentioned above will include the following information for the proposed Umatilla Fish Hatchery:

1) rearing schedules and release sites and schedules.
2) a detailed production profile that includes numbers of fish to be released and expected annual adult returns.
3) harvest strategies for naturally and hatchery produced fish.
4) proposed management policies and hatchery practices which will ensure that hatchery releases:
   a) protect genetic integrity of native stocks;
   b) are as disease-free as possible;
   c) are coordinated with other fishery management agencies and tribes in the Columbia River Basin.
5) a proposal for biological monitoring and evaluation of the hatchery program.

Development of the Umatilla Fish Hatchery, a joint agency effort, is designed to preserve and enhance summer steelhead and possibly spring and fall chinook salmon stocks of the Umatilla River. The hatchery would provide increased harvest opportunities to the commercial, ceremonial, and subsistence fisheries of the CTUIR and the regional sport fishery.

1.2 NEED FOR THE PROPOSED PROJECT

The native population of summer run steelhead which inhabits the Umatilla River has been adversely impacted through habitat degradation within the Umatilla and Columbia River systems. The annual return of native summer steelhead to the Umatilla River has averaged approximately 1800 fish between the 1966-1967 and 1982-1983 seasons (Boyce 1986). Historically, the Umatilla River supported runs of fall and spring chinook and coho salmon; however, these runs have since been eliminated. Hydroelectric development in the mainstem Columbia has impaired salmon and steelhead migrations and decreased survival, while in the Umatilla River basin land development activities, private hydro development, and the construction of irrigation diversion structures have depleted valuable spawning and rearing habitat. Most chinook were eliminated from the Umatilla over 50 years ago, although a few spring

chinook were observed as recently as 1963 (Oregon Game Commission, 1963) and fall chinook as recently as 1957 (Thompson and Haas, 1960). Fall chinook have been released in the Umatilla basin since 1982 and spring chinook were released in the basin in 1986.

The Northwest Electric Power Planning and Conservation Act of 1980 (Pacific Northwest Power Act) directed the NWPPC to "promptly develop and adopt . . . a program to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries." The Pacific Northwest Power Act explicitly gives BPA the authority and responsibility to use its legal and financial resources "to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries in a manner consistent with . . . the program adopted by the Council . . . and the purposes of this Act."

In the 1984 Columbia River Basin Fish and Wildlife Program (NWPPC 1984) hatchery propagation of anadromous fish is identified as a viable means to enhance the dwindling runs of naturally spawning salmon and steelhead in the Columbia River system and to mitigate the effects of hydroelectric development. Measure 704(i)(1) of the Fish and Wildlife Program provides guidance to BPA "to fund the construction of a facility to increase the existing hatchery production to provide for an additional 200,000 summer steelhead smolts for release in the Umatilla juvenile release and adult collection and holding facilities." The ODF&W- and CTUIR-proposed amendment to the 1986 Fish and Wildlife Program recommends that BPA expand design of the Umatilla Fish Hatchery to include production of spring and fall chinook.

The proposed Umatilla Fish Hatchery is consistent with the goals of the Pacific Northwest Power Act and with the NWPPC's Fish and Wildlife Program. BPA, therefore, proposes to fund construction, operation, and maintenance of the Umatilla Fish Hatchery to mitigate anadromous fish losses in the Umatilla River resulting from Columbia River hydroelectric development.

1.3 LOCATION AND DESCRIPTION OF THE PROPOSED FACILITIES

1.3.1 Hatchery Location

Two sites are presently being proposed for the hatchery. These proposed sites for the Umatilla Fish Hatchery are located in Morrow County about 3 miles west of Irrigon, Oregon. The sites are adjacent the Columbia River, 14 miles downstream of McNary Dam, at approximately river mile (RM) 278.8 (Figure 1). Located in Section 15, Township 5 North, Range 26 East, both sites are currently owned by the Federal Government, administered by the Corps of Engineers, and at least partially under lease from the Corps by Tidewater Barge Company. BPA and Tidewater are presently in negotiations so that with hatchery development BPA could purchase the remaining 7 years of the Tidewater lease, leaving Tidewater with no interest in the property after purchase of the lease. Also, the Corps has agreed to enter into a special use permit with BPA, so the land proposed for hatchery development will remain in Federal ownership (McIver, pers. comm. 1986).

1.3.2 Hatchery Description

This section contains general hatchery information which would be applicable to either site location and both the expansion and no expansion alternatives.

Hatchery facilities will consist of a hatchery building, raceways, and a settling basin with discharge to the Columbia River, a well and a water aeration/distribution building. The hatchery building will contain incubation and early fry rearing facilities, a food storage area, a laboratory, an office, crew facilities, and public restrooms.

Hatchery and visitor parking areas, employee residences, and a paved road providing access to hatchery facilities are included in project development plans. Access to the Umatilla Fish Hatchery will be provided from the existing Irrigon Hatchery Road located adjacent the proposed sites (Figures 3 and 4).

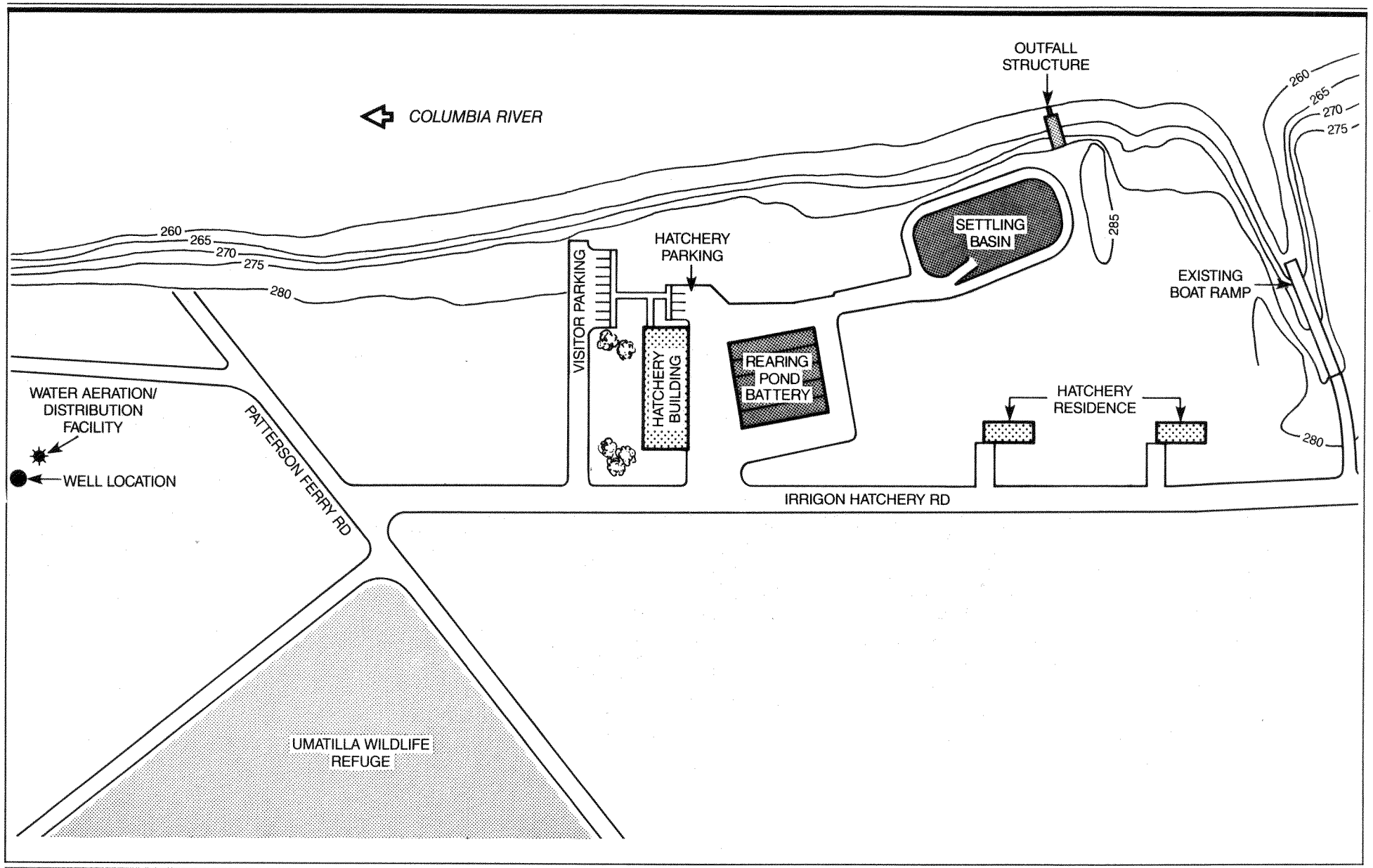
The hatchery laboratory will be a small facility for use primarily by the ODF&W fish pathologist during routine hatchery visits. The lab may also be used by CTUIR/ODF&W personnel for collection of samples or examination of fish from or destined to the acclimation facilities, or habitat in the upper Umatilla Basin. The lab will contain a refrigerator and freezer, sink, and dissecting microscope. For detailed pathological work the main ODF&W laboratory in Corvallis, Oregon, will be used.

The electrical service for the Umatilla Fish Hatchery will be provided by Umatilla Electric Cooperative Association of Hermiston from the existing 12.5-kV line. The electric service to the residences and to the water supply pump station will be separate from the hatchery electrical system.

A major feature of site development will be the hatchery water supply and delivery system. Current plans call for a Ranney well system to be developed on a small parcel of Federally owned land adjacent the western boundary of the downstream site (Figure 3). The Corps has also agreed to issue to BPA a special use permit for this small parcel.

The Ranney system will consist of a main 16-foot diameter vertical well shaft with a series of smaller lateral groundwater collection shafts radiating out near the base of the main shaft. Water collected in the lateral "arms" will be delivered to the base of the main vertical shaft. Electric pumps will deliver the water collected in the Ranney well to a water distribution building or headbox. The headbox facility will provide for aeration of the well water prior to distribution to the hatchery incubation room and rearing ponds. Aeration will be accomplished by the use of packed columns. This method allows well water to free fall through cylinders (5 ft. long and 1 ft. diameter) oriented vertically and packed with spoked 2-inch diameter plastic rings (biorings). The falling water splashes as it contacts the rings facilitating interchange with atmospheric gases.

Water will be delivered through underground pipes via a gravity flow system from the headbox to the hatchery facilities. Each incubator stack, each



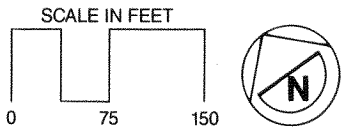
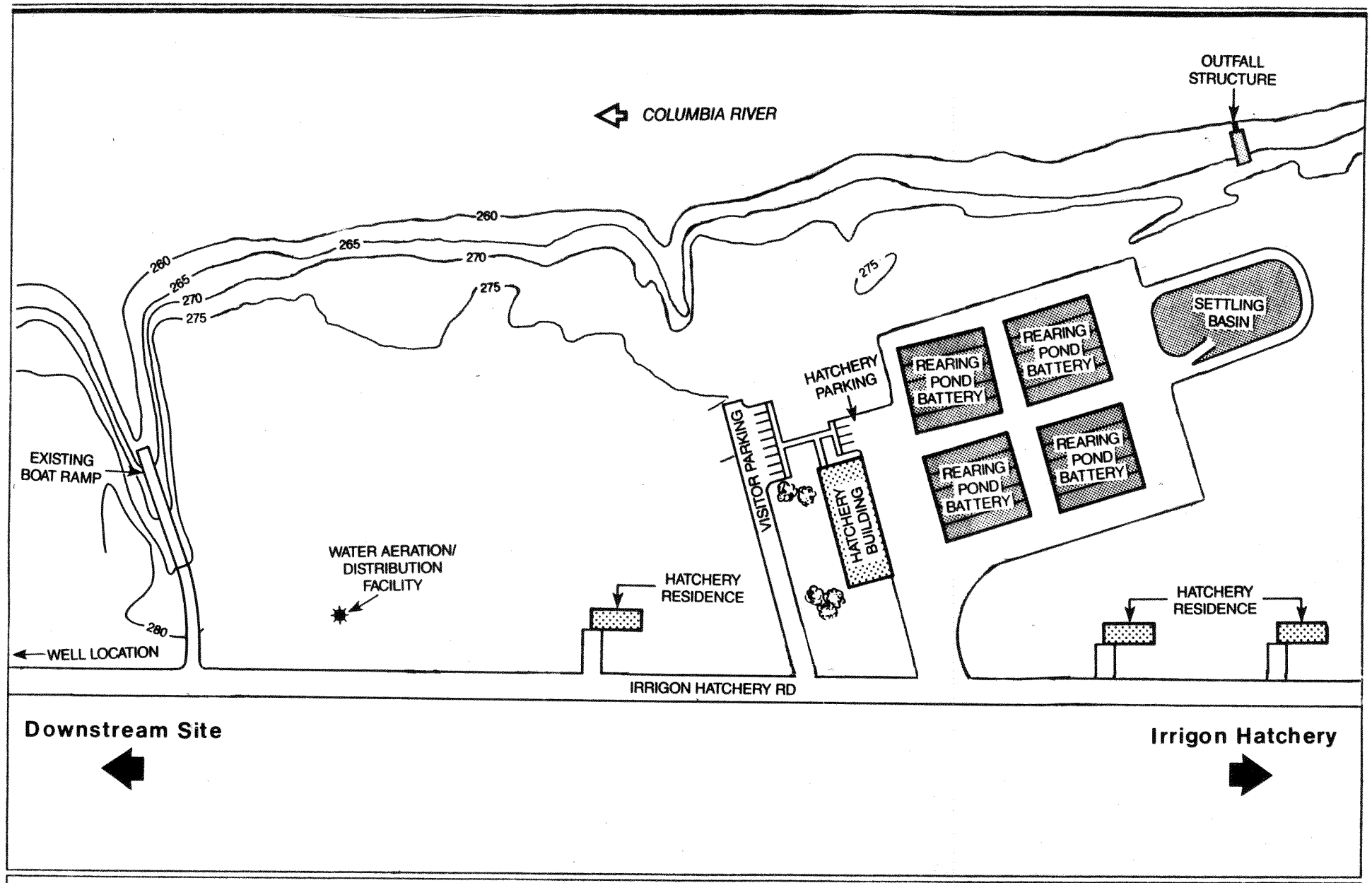


Figure #3.
Umatilla Fish Hatchery Downstream Site – No expansion facility plan.



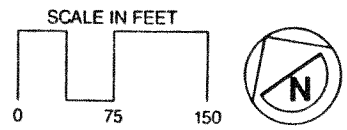


Figure #4.
Umatilla Fish Hatchery
Upstream Site
Expansion Facility Plan

starter tank, and each raceway will have an independent water supply fed from the main supply line. After circulation through the incubators, starter tanks or raceways, water will be discharged to the hatchery effluent pipeline, which in turn discharges to the Columbia River. During periodic raceway cleaning, a slurry of fish wastes and unconsumed food will be pumped into the effluent pipe. This operation requires the effluent be diverted, by use of gate valves in the discharge line, from discharge to the Columbia River to a settling basin. After a minimum of 2 hours of settling time, water will discharge from the settling basin to the Columbia River.

Average water temperature, based on the nearby Irrigon Hatchery Ranney wells, is expected to be about 56°F, which is within the accepted range for steelhead and chinook salmon propagation (Senn et. al. 1984). A water chiller is incorporated into the egg incubation facility to maintain the incubation temperature between 50°F and 52°F.

Chapter 2

ALTERNATIVES CONSIDERED BY BPA

2.1 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

2.1.1 No-Action Alternative

The no-action alternative does not address the need to mitigate hydroelectric project impacts on salmonid resources of the Columbia River basin. It does not reflect the intent of the Pacific Northwest Power Act, and no action would forestall implementation of Measure 704(i)(1) as well as any proposed amendments/measures of the 1986 Fish and Wildlife Program. The no-action alternative would result in a continuing inadequate number of adult summer steelhead and spring and fall chinook returning to the Umatilla system. No relief would be provided for supplementing the currently depleted summer steelhead and fall and spring chinook stocks in the Columbia River system. Because the no-action alternative would not meet the need for the project, it is eliminated from further discussion in this document.

2.1.2 Other Eliminated Alternatives

BPA authorized and funded an ODF&W Umatilla Fish Hatchery site evaluation study (ODF&W 1985). Between July 1984 and January 1985, ODF&W evaluated 11 potential new hatchery and hatchery expansion proposals that would meet the NWPPC Fish and Wildlife Program measure to rear 200,000 Umatilla summer steelhead smolts.

A summary of this evaluation entitled Umatilla River Summer Steelhead Hatchery, Phase I Completion Report was submitted to BPA in February 1985. The siting study found a general lack of suitable surface water sources for hatchery production. Either water quantities were not sufficient to rear 200,000 steelhead smolts or disease problems were already present, and as a result, the 11-site field was narrowed to four.

The four remaining sites were located in the region between Umatilla and Boardman, Oregon. This area was judged favorable for hatchery development due to the quantity and quality of available groundwater.

Of the remaining four sites, expansion of the Irrigon Hatchery was dropped from consideration due to: possible construction delays at Irrigon Hatchery; the possibility of disease spread; and the possibility of genetic contamination between Snake River and Umatilla River fish. A county line site was eliminated from consideration because of site-related design and construction problems and the anticipated excessive cost in developing a water supply. A site owned by Tidewater Barge Company, located east of Paterson Ferry Road and south of Irrigon Hatchery Road, was also eliminated from detailed study due to the excessive cost of the 90-acre parcel (only 5 to 7 acres are necessary for hatchery development), as well as the potential difficulty in obtaining this site within the set project development timeframe.

2.2 PROPOSED ALTERNATIVE SITES

2.2.1 Downstream Site Alternative

This is the same site as the Paterson Ferry Road site suggested in ODF&W's 1985 siting evaluation study. It is approximately 18 acres in size and its location is described in section 1.3.1. The proposed downstream hatchery site is bounded by the Paterson Ferry Road to the west, the Irrigon Hatchery Road to the south, a boat launch and access road to the east, and the Columbia River to the north (see Figure 3). A well system, for hatchery water collection, would be developed on less than 1 acre of Federal land adjacent the downstream hatchery site. The river bank, which constitutes the northern boundary of both this and the upstream site, is a 3- to 6-foot gravel scarp with a top elevation of about 270 feet mean sea level (MSL).

2.2.2 Preferred Site Alternative - Upstream Site

In October 1986 BPA met with local officials from the Irrigon area to discuss siting of the proposed Umatilla Fish Hatchery. At this meeting a site located directly upstream of the Paterson Ferry Road site was suggested and is considered BPA's preferred site alternative. This site is approximately 28 acres in size and its location is described in section 1.3.1. This upstream site is bounded also by the Irrigon Hatchery Road to the south and the Columbia River to the north, with a boat launch and access road to the west and the Irrigon Hatchery property boundary to the east (see Figure 4). The well system for this alternative would be the same as for the downstream site. An underground pipeline running along the north side of Irrigon Hatchery Road would convey water to this site.

2.3 PROPOSED ALTERNATIVE CONSTRUCTION PLANS

2.3.1 No-Expansion Alternative

There are two possible construction alternatives which could be located at either the downstream or upstream site. This no-expansion alternative addresses implementing the existing Fish and Wildlife Program measure 704(i)(1) and would involve constructing a fish hatchery to produce 200,000 summer steelhead smolts. A site plan for this no-expansion alternative is presented in Figure 3. Development of the hatchery facility would require approximately 5 to 6 acres for either site. The well system would be developed for full capacity (i.e. approximately 30 cubic feet per second (cfs) or at least twice the required amount of water to raise 200,000 steelhead smolts); however, no other expanded hatchery facilities would be planned or constructed at this time. Five raceways and two residences would differentiate this site plan from the expansion site plan. Operation and maintenance of the hatchery will require two full-time employees.

Hatchery fish will be fed a commercially prepared dry diet. Dry feed typically has a 10-percent moisture content and requires storage in a dry, cool location. The food storage room will accommodate approximately 40,000 pounds of the 60,000-pound annual hatchery requirement of fish feed.

The water collection system, as mentioned above, will be designed to deliver approximately 30 cfs to the headbox. At a rearing density of 7.2 pounds of steelhead smolts per gallon per minute (gpm) inflow (Senn et. al. 1984), and at maximum hatchery production (40,000 pounds of fish at 5 fish per pound), the total water requirement will be 5555 gpm or about 12 cfs. The 30-cfs capacity of the water delivery system will, therefore, provide at least twice the necessary quantity of water under maximum hatchery production. Since normal hatchery operation will require steelhead to be reared to only 6 or 8 fish per pound (prior to transfer to the acclimation ponds), typical water requirements at the hatchery will be less than 12 cfs.

The hatchery incubation facility will contain 40 egg incubation trays. At a density of 7500 eggs per tray (approximately one-half the tray capacity), the incubation facility will easily accommodate the 300,000 eggs necessary to rear 200,000 steelhead smolts. Incubation trays will be configured in groups of four with each 4-tray group constructed with independent water supply and discharge capabilities. This type of water supply isolation system limits potential waterborne contaminants, such as disease organisms, from affecting more than four egg trays during incubation. For early fry rearing the hatchery will be equipped with eight circular starter tanks, each 6 feet in diameter and 4 feet deep.

The five outdoor concrete raceways will measure 100 x 20 x 4 feet and provide 40,000 cubic feet (ft^3) of rearing area. At maximum capacity these raceways will hold approximately 40,000 pounds of steelhead (200,000 fish at 5 fish per pound), or a density of 1 pound per ft^3. This density is well within established limits, as it is less than the 1.2 pounds per ft^3 goal of ODF&W (Stratton, pers. comm. 1986) and the 2 pounds per ft^3 maximum discussed by Senn et. al. (1984). Under normal operation, steelhead will be transferred from the raceways to the acclimation ponds at a size of 6 to 8 fish per pound, thereby maintaining even lower raceway densities.

2.3.1.1 Hatchery Program

Native Umatilla River summer steelhead will be used as brood stock for the proposed Umatilla Fish Hatchery. The freshwater life cycle of summer steelhead to be reared at the Umatilla Fish Hatchery is presented in Figure 5. Adults will be collected for spawning throughout the period of their return to the Umatilla River (November through March), thereby maintaining genetic diversity. Initially, adult collection will take place at Three Mile Falls Dam on the lower Umatilla River (Figure 2). Approximately 60 female steelhead will be required to fulfill the estimated 300,000 egg take goal (Stratton pers. comm. 1986). An average of 5000 eggs per female for Umatilla River steelhead was assumed based on data presented in the Umatilla River Comprehensive Plan (Boyce 1986). The Comprehensive Plan also estimates a male to female sex ratio of 1 to 1 for returning adults and a brood stock mortality rate of 25 percent. Using these criteria, a total of 160 adult steelhead will be required annually for the Umatilla Fish Hatchery brood stock. This is a conservative estimate, as pond mortality may be less and spawning can be accomplished with fewer males. Steelhead returns to the

Freshwater life cycle of Umatilla

SUMMER STEELHEAD

reared at the proposed Umatilla Fish Hatchery.

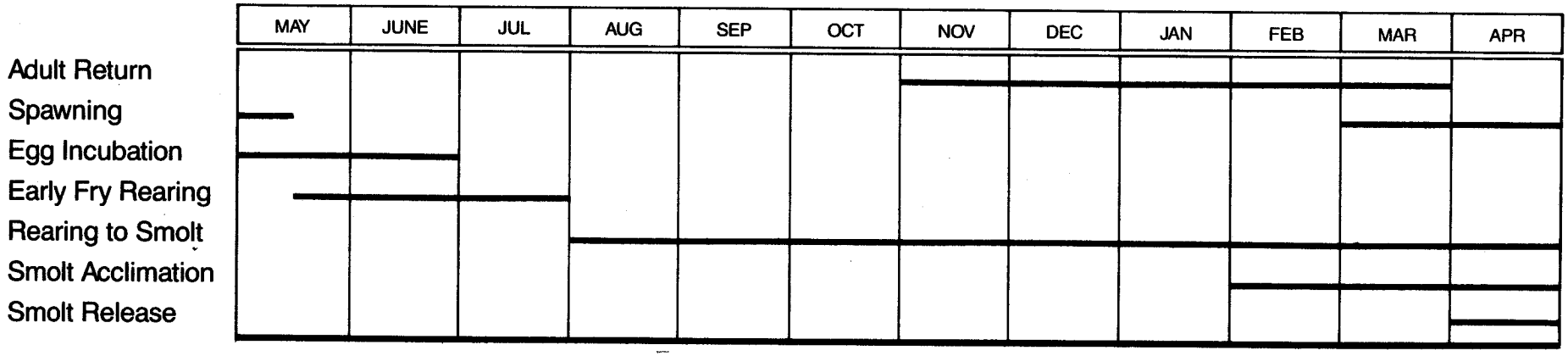


Figure 5.

Umatilla system have averaged about 1800 fish between 1966 and 1982 (Boyce 1986). The hatchery brood stock requirement, therefore, will represent about 9 percent of the annual average return.

Assuming an egg-to-smolt survival of 70 percent (Boyce 1986), a total of 210,000 steelhead smolts would be available for release in April. The excess of 10,000 fish above the release goal provides a margin of safety should the egg to smolt mortality rate be impacted by unforeseen circumstances, such as viral or bacterial infection.

Prior to spawning it may be necessary to hold adult steelhead collected at Three Mile Falls Dam. In such cases, adults will be trucked to holding facilities at Minthorn Springs for spawning (Figure 2). Fertile or green eggs collected at the Minthorn Springs facility will then be transported to the Umatilla Fish Hatchery for incubation.

Spawning should be complete in May, with egg incubation in May and June. After hatching and yolk absorption, fry will be transferred from the incubation trays into the early rearing tanks. When steelhead fry approach density limits in these tanks, they will be transferred to the five outside raceways for extended rearing.

As fish approach smolt size (February through March) they will be trucked to the Bonifer and Minthorn Springs juvenile acclimation ponds on the Umatilla River (Figure 2). Final rearing to smolt size (5 fish per pound) and smolt release will occur at these facilities. In April, smolts will be allowed to outmigrate on their own accord, facilitating a natural downstream migration.

Salmonid smolts use their olfactory senses to imprint on subtle and unique chemical characteristics present in the stream or river water they encounter during outmigration. This imprinting ability allows adult fish returning to spawn to locate their natal waters. The release of 200,000 Umatilla Fish Hatchery reared summer steelhead smolts from the acclimation facilities into the Umatilla system is expected to result in a return of 5400 adult summer steelhead to the Umatilla River (Boyce 1986). Approximately 120 adult steelhead will be collected for the brood stock from November through March each year. The rest of the run will be available for in-river harvest and natural spawning within the system. Part of the in-river harvest will be allotted to the Confederated Tribes of the Umatilla Indian Reservation ceremonial and subsistence fisheries. A smaller portion will likely be available for the steelhead sport fishery. Harvest quotas will likely be set on an annual basis and determined in part by the strength of the adult return. Both ODF&W and the CTUIR will participate in determining harvest rates.

The first egg take for the proposed Umatilla Fish Hatchery is scheduled for 1988, with the first smolt release scheduled for 1989. From this first release, a return of approximately 5400 summer run adult steelhead are expected to the Umatilla River in 1991. For those years after initial egg take, but prior to the first adult return, it will be necessary to continue

brood stock collection at Three Mile Falls Dam. After establishment of the hatchery run, however, adults will be collected upon their return to the Minthorn and Bonifer Springs facilities.

2.3.2 Expansion Alternative

This alternative addresses implementing ODF&W and CTUIR's proposed amendment to the 1986 Fish and Wildlife Program. Current planning indicates that the additional capacity would be used to produce 120,000 pounds of spring and fall chinook salmon. However, numbers and species of anadromous fish raised at an expanded hatchery are subject to revision during forthcoming regional master planning.

A facility site plan for this expansion alternative is presented in Figure 4. Hatchery development would require approximately 7 acres at either the upstream or downstream site for buildings and fish culture facilities. For a desired fish rearing density of 11.4 pounds/gpm of water, the well would be developed for full capacity, i.e. approxiamtely 14,000 gpm or 30-31 cfs. Twenty raceways and three hatchery residences would be the only structural differences between this alternative and no expansion. The settling basin would be sized the same because under either alternative only two raceways would be cleaned at any one time. Operation and maintenance of the hatchery will require three full-time employees.

The hatchery incubation facility will contain 280 egg trays (2.1 million egg capacity at 7500 eggs/tray). 300,000 steelhead plus 1,800,000 chinook eggs will be incubated at the Umatilla Fish Hatchery (see figures 6 and 7 for freshwater lifecycles of Umatilla fall and spring chinook). Incubation trays would be configurated the same as for the no-expansion alternative and no additional starter tanks would be required. A total of 20 raceways (100' x 20' x 4') will be needed to rear 160,000 pounds of steelhead and chinook at a density of 1 pound/ft^3 (same criteria as the no-expansion alternative).

Chinook will be fed a moist diet (Bio-moist and OMP) and steelhead a dry diet food. The total annual food requirement for the hatchery would be 210,000 to 220,000 pounds. A refrigerated food storage room will be required for storing approximately 50,000 to 60,000 pounds of food.

2.3.2.1 Hatchery Program

The proposed hatchery program for this alternative would be the same for steelhead, as explained under the no-expansion alternative, and would add the following program for fall and spring chinook.

This hatchery facility would be designed to raise 40,000 pounds of summer steelhead smolts and 120,000 pounds of chinook salmon smolts. Release of 120,000 pounds of chinook smolts will result in an estimated return of 7500 adults to the Umatilla basin (Boyce, pers. comm. 1986). The release scenarios to be worked out in the master production plan may result in adult returns that are different from this initial estimate.

Freshwater life cycle of Umatilla

FALL CHINOOK

reared at the proposed Umatilla Fish Hatchery.

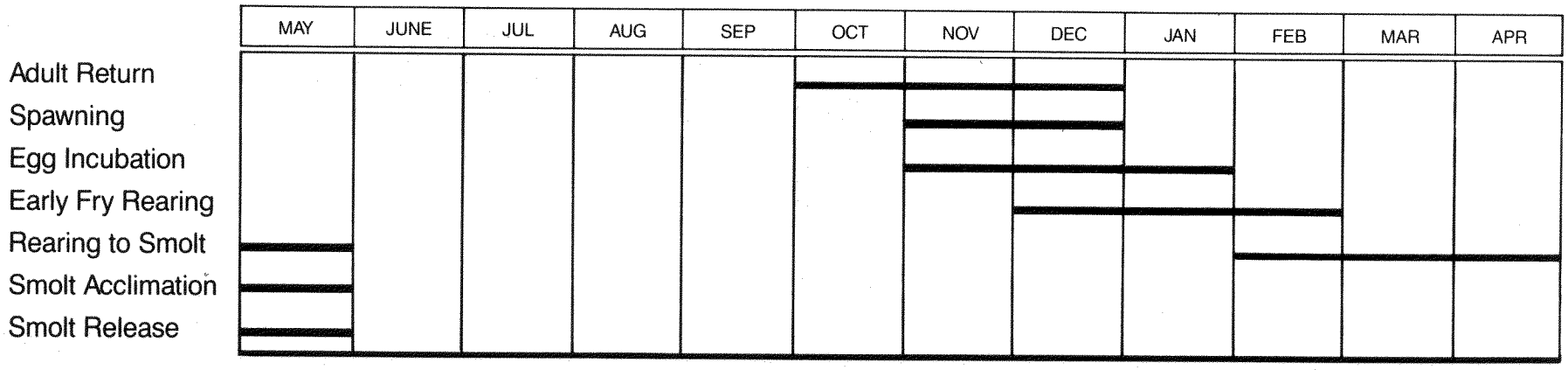


Figure #6

Freshwater life cycle of Umatilla

SPRING CHINOOK

reared at the proposed Umatilla Fish Hatchery.

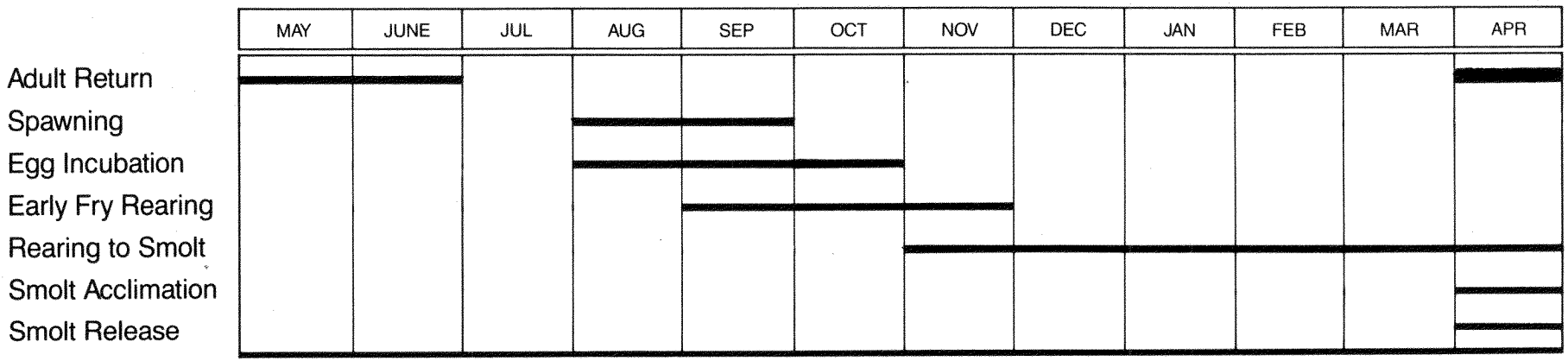


Figure #7

Until natural runs are developed, upriver bright fall chinook at Bonneville Hatchery and upriver spring chinook (early run) at Carson Hatchery (or other suitable broodstock identified by CTUIR and ODF&W), will be used for brood stock. Later, brood stock of adults returning to the Umatilla will be collected at Three Mile Falls Dam and at Bonifer and Minthorn adult collection facilities throughout runs to ensure genetic diversity. All species would be spawned at the holding facilities and fertilized eggs transported to the Umatilla Fish Hatchery for incubation.

Surplus chinook (above brood stock and spawning needs) will be harvested in non-Indian and Indian fisheries.

Further details of an expanded hatchery program will be developed through a master planning process.

Chapter 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

The impacts addressed in this chapter apply equally to the expanded hatchery facility and to the 200,000 steelhead smolt facility, unless otherwise stated.

3.1 EXISTING AND PLANNED LAND USE

The proposed hatchery sites are bordered on the northeast by the John Day Reservoir on the Columbia River, on the southeast by property associated with the existing Irrigon Hatchery, on the west by Paterson Ferry Road, and on the southwest by the Irrigon Hatchery west entrance road (Figures 3 and 4). Access to the sites will be provided by existing County roads. The Morrow County Grain Growers elevator is located a short distance west of both hatchery sites on the west side of Paterson Ferry Road. Southwest of the hatchery sites on the southwest side of the Irrigon hatchery west entrance road lies undeveloped property owned by the Tidewater Barge Company. Further to the west, southwest, and south lies the Umatilla National Wildlife Refuge (Figure 1). Within the refuge, just south of the Morrow County Grain Growers elevator, land is under irrigated cultivation.

The proposed hatchery sites are currently undeveloped and vacant. An unmaintained gravel road extends from Paterson Ferry Road and runs generally eastward across both sites. A boat ramp is located just north of the Irrigon Hatchery west entrance road about 1000 feet east of Paterson Ferry Road (Figures 3 and 4). Road access to the boat ramp will continue during hatchery construction and operation at either site.

The sites are not presently under cultivation. Both sites contain soils classified by the U.S. Soil Conservation Service as Ellum fine sandy loam. This soil type typically supports range and wildlife habitat and is not considered prime or unique farmland (Adelmen, pers. comm. 1986). The proposed sites, therefore, are not located on soils designated prime or unique, or of Statewide importance as outlined in the Council on Environmental Quality Memorandum, analysis of Impacts on Prime and Unique Farmlands (45 FR 59186, September 8, 1980).

The proposed hatchery sites are Federally owned, administered by the Corps, and at least partially leased to Tidewater Barge Company. The lease was made for the purpose of interchanging munitions and general commodities to and from the Umatilla Army Depot 5 miles southeast of the sites. However, this practice has since been discontinued (Slyngsted, pers. comm. 1986). Termination of this lease, which has 7 years remaining, will be necessary to allow construction of the proposed hatchery.

Construction of the proposed hatchery by BPA will require a special use permit from the Secretary of the Army. No grant of a right-of-way pursuant to the

Federal Land Policy and Management Act (Title 43 USCA, Chapter 35) would be required, as the proposed hatchery site is not administered by the Secretary of the Interior and, therefore, is not a public land as defined by that statute.

The Intergovernmental Cooperation Act (ICA) of 1968 (42 USC 4231(c)) and Executive Order 12372 require coordination of Federal aid programs with State and local comprehensive planning. The proposed hatchery sites are owned by the Federal Government and are not subject to State or local land use regulations. Therefore, requirements of Executive Order 12372 do not apply.

However, State and local land use policies were examined, and the proposed hatchery (a nonresidential, light industrial use) is consistent with the surrounding industrial zoning. Nonfederally owned property south and west of the proposed hatchery sites is zoned industrial. This zoning designation allows for a variety of manufacturing and other industrial uses.

Although the area west and south of the proposed Umatilla Fish Hatchery is zoned industrial (Seeger, letter of July 1, 1986), existing land use such as the Irrigon Hatchery, the Umatilla National Wildlife Refuge, as well as development of the proposed Umatilla Fish Hatchery, may limit certain future heavy industrial uses.

The proposed hatchery site is not within the coastal zone of Oregon which extends only to RM 38 on the Columbia River. As a result, this project is not subject to the Oregon Coastal Zone Management Program. This program, established pursuant to the Coastal Zone Management Act (16 USC 1451 et. seq.), defines permissible land and water uses within the coastal zone.

Several locations adjacent to John Day Reservoir in Morrow County, including about 450 feet of shoreline in the northwest corner of the proposed downstream hatchery site, have been identified in the County's comprehensive plan as deep water properties (Seeger, pers. comm. 1986). The County Plan calls for deep water properties to be reserved for uses dependent upon deep water access, (e.g., port facilities, etc.). Use of the proposed downstream site for a hatchery would preclude future port facility development. Hatchery development at the upstream site would not prohibit access to the deep water property and is not in conflict with the County's Plan (site visit, October, 1986). Therefore, BPA has designated the upper site as its preferred site for construction of the Umatilla Fish Hatchery.

The proposed hatchery sites, adjacent to the Irrigon Hatchery and Umatilla National Wildlife Refuge, are compatible with the Corps' John Day Lock and Dam Master Plan (Corps 1976) which allocates these properties as habitat for fish and wildlife or for propagation of such species.

Traffic associated with construction and operation of the hatchery will contribute to the current traffic load and patterns on Paterson Ferry Road and possibly on 8th Street into the town of Irrigon. Construction traffic will access the site from these two roads primarily during the spring through fall

construction period. BPA construction contracts will stipulate that road use be coordinated with the Morrow County Planning Department and Public Works Department so that traffic impacts will be kept to a minimum.

Future long-term use of local roads necessary for hatchery operation can contribute to potential volume- and pattern-related traffic impacts. The close proximity of the proposed hatchery sites to the county population center, as well as residential development in the vicinity of the sites, tend toward potential long-term safety-related traffic impacts (Seeger, pers. comm. 1986). Hatchery vehicles will contribute to local traffic volumes with local and regional demographic trends impacting traffic volumes as well. In response to increased traffic volume associated with hatchery operation, BPA and ODF&W will cooperate with Morrow County in development of traffic routes to alleviate potential hatchery-related traffic impacts. Coordination and consultation with the Morrow County Public Works Department is considered a logical first step toward addressing potential traffic impacts (Ball, pers. comm. 1986). Also, trucking operations for the Umatilla Fish Hatchery will be coordinated with Irrigon Hatchery's operations, when possible, in order to eliminate unnecessary traffic.

3.2 RECREATION

The proposed hatchery sites, which lie adjacent the south bank of the John Day Reservoir, are used informally for camping and fishing. In particular, the sites are used to access the river for sturgeon fishing, with heaviest use occurring from spring through fall. Up to 30 anglers have been seen fishing from the river bank in the area of the sites at one time (Beamesderfer, pers. comm. 1986).

The proposed hatchery includes visitor parking; however, public viewing of hatchery operations will not be encouraged. The existing access road across both sites to the bank of the John Day Reservoir will remain intact so that sturgeon fishing can continue in the area. Development of the hatchery will eliminate use of either site for camping; however, neither site is a designated camping area. The nearest designated camping area is at Boardman City Park approximately 15 miles west of the hatchery sites. The boat ramp located between both sites will remain in Federal ownership, and use of the boat ramp by fishermen will continue.

The Umatilla National Wildlife Refuge is located about 1/4 mile south of the proposed hatchery sites. Hunting and birdwatching are two primary recreation activities which occur in the refuge. Construction traffic passing along Paterson Ferry Road may result in minor short-term (lasting 9 to 12 months) impacts on recreation use in the refuge due to noise and visual disturbance. Construction and operation of the hatchery, however, will have no long-term impact.

The proposed hatchery sites are not located in close proximity to any designated Wild and Scenic Rivers. Likewise, the proposed hatchery sites are not located in proximity to any National Recreation or Scenic Trails, Wilderness Areas, or Bureau of Land Management (BLM) administered area of critical concern.

3.3 VEGETATION, FISH, AND WILDLIFE

3.3.1 Vegetation

The project sites lie within the shrub-steppe region of the Columbia Basin province, described by Daubenmire (1970) and by Franklin and Dyrness (1973). Big sagebrush, bitterbrush, low sagebrush, and rabbitbrush are typical dominant shrubs near the Columbia River within this region (Tabor 1976). Bluebunch wheatgrass, Idaho fescue, Sandberg's bluegrass, and cheatgrass are the primary grasses.

Soils and vegetation on the project sites have been disturbed by uncontrolled vehicle access, grazing, ditching for irrigation, and unidentified heavy equipment use. Gray rabbitbrush is the dominant shrub, with other common plants consisting of Russian thistle, starvation cholla, and grasses. Much of the ground is bare.

There are no trees on either site. The nearest trees (a row of black locust) are about 1500 feet to the southeast of both sites, bordering the Umatilla National Wildlife Refuge. The hatchery sites are perched several feet above the Columbia River, and there is no distinctive riparian vegetative zone. A cobble and sand beach, approximately 20 feet wide, parallels the river.

No wetland plants occur onsite or immediately adjacent the sites. A flood-irrigated area containing some wetland plants is located about 3000 feet south of the area on the Umatilla Refuge (Tabor 1976). Operation of the Ranney well system will not affect the flood-irrigated wetland on the refuge due to the well's distance (4000 feet) from the wetland, and the well's use of recharged river water which has a static level approximately 14 feet below ground (McDowell 1986). The project, therefore, complies with Executive Order 11990 (Protection of Wetlands) which requires Federal agencies to minimize the loss or degradation of wetlands.

No listed or proposed endangered or threatened plant species or candidate plant species have been identified in the project vicinity (USFWS letter, Appendix A).

Hatchery construction would permanently remove 5 to 7 acres (5 for no expansion and 7 for expansion) of previously disturbed shrub and herbaceous vegetation from the sites. Construction activities will result in about 9 to 12 months of onsite soil disturbance. After construction of the facility is complete, the site will be revegetated and landscaped.

3.3.2 Fisheries

The sites being considered for the proposed Umatilla Fish Hatchery are located adjacent the John Day Reservoir on the Columbia River, but do not support any surface water systems (ponds, lakes, streams, or estuaries). The John Day pool provides habitat for a variety of resident and anadromous fish (Table 1).

TABLE 1

RESIDENT AND ANADROMOUS FISH INHABITING JOHN DAY RESERVOIR

RESIDENT FISH	ANADROMOUS FISH
Walleye	Steelhead
Carp	Chinook salmon
Bridgelip sucker	Coho salmon
Largescale sucker	Sockeye salmon
Squawfish	Shad
Largemouth bass	Three-toothed lamprey
Smallmouth bass	
Sturgeon	
Channel catfish	
Whitefish	
Redside shiner	
Peamouth	
Dace	
Chiselmouth	
Threespine stickleback	
Sculpin	
Yellow perch	
Troutperch	
Brown Bullhead	
Yellow bullhead	
Mosquito fish	
White crappie	
Black crappie	
Bluegill	
Pumpkinseed	

John Day Reservoir is an important migration corridor for juvenile and adult salmon and steelhead. Salmonid stocks inhabiting the Snake and mid-Columbia River systems, and their respective hatcheries, migrate downstream through John Day pool as juveniles and upstream through the reservoir as adults on their spawning migration. Juvenile anadromous hatchery fish will not be released at the hatchery location but will be transported to Minthorn and Bonifer Springs acclimation facilities for release.

The Umatilla River discharges to the upper reach of John Day Reservoir at approximately RM 289 on the Columbia. Historically, the Umatilla River supported runs of fall and spring chinook and coho salmon before runs were eliminated through overfishing, extensive water use, habitat degradation, and construction and operation of Columbia River hydroelectric projects. The Umatilla River presently supports a small run of native summer steelhead. Annual counts of adults at Three Mile Falls Dam on the lower Umatilla River from 1966-1967 through 1982-1983 averaged 1861 fish (Boyce 1986).

The summer steelhead population, while at a relatively low level in the Umatilla, has been maintained by hatchery plants to the system and the generally more favorable river flows during adult steelhead return in November through March. Chinook runs have not, as of yet, been reestablished. The ODF&W Oak Springs Hatchery is the primary facility rearing Umatilla stock steelhead for release to the Umatilla system. Bonneville Hatchery is a producer of upper river bright stock fall chinook and Carson and Irrigon Hatcheries are producers of Carson stock spring chinook, all for release to the Umatilla system. Table 2 shows the hatchery releases of summer steelhead, fall chinook, and spring chinook in the Umatilla River in the past 10 years.

Current enhancement efforts and proposed plans for the Umatilla (Boyce 1986, NWPPC 1984) are designed to improve adverse conditions which limit anadromous fish production within the basin. Involved resource agencies are cooperating to enhance flows and improve salmonid habitat within the Umatilla system.

The absence of onsite fishery resources precludes potential impact to fishery resources or habitat as a result of project construction.

The limited amount of near-river construction required for the proposed project, the dry construction methods proposed for construction of the discharge structure, and the water quality requirements of the Corps' Section 10/404 permits will eliminate potential adverse impacts to fishery resources of John Day Reservoir.

Proposed hatchery operation will result in discharge of rearing water to the Columbia River. Hatchery effluent will not exceed National Pollutant Discharge Elimination System (NPDES) permit requirements (see section 3.4) and will not impact resident or anadromous fish inhabiting the Columbia River.

Current plans are to manage the Umatilla Fish Hatchery to enhance summer steelhead and possibly spring and fall chinook stocks in the Umatilla River. The hatchery will annually plant 40,000 pounds of Umatilla stock summer steelhead smolts and 120,000 pounds of Upper River Bright stock fall chinook smolts and Carson stock spring chinook smolts into the Umatilla system. Hatchery smolts will actively migrate from the Minthorn and Bonifer Springs facilities through the Umatilla system. Smolts will compete with, and prey upon, other fish species inhabiting the Umatilla and Columbia Rivers.

Of primary concern is potential predation by Umatilla steelhead on chinook salmon fry. As shown in Table 2, chinook are being released into the Umatilla system by ODF&W with the intent of establishing a viable natural spawning population in the lower reaches of the Umatilla River (Boyce, pers. comm. 1986). While hatchery-reared summer steelhead are known to prey upon spring chinook fry (Evenson et. al. 1981; Boyce, pers. comm. 1986), the occurrence or extent of potential predation by Umatilla Fish Hatchery summer steelhead on Umatilla chinook is unknown (Boyce, pers. comm. 1986).

Historically the Umatilla system supported a much larger summer steelhead and spring and fall chinook population than will be realized by this project.

TABLE 2

HATCHERY RELEASES OF SUMMER STEELHEAD, FALL CHINOOK AND SPRING CHINOOK IN THE UMATILLA RIVER IN THE PAST 10 YEARS

Year of release	Hatchery	No. released	No./lb.	Stock
Summer Steelhead				
1967	Gnat Creek	109,805	75.0	Skamania
1967	Oak Springs	272,900	117.0	Idaho (Oxbow)
1967	Wallowa	142,240	240.0	Idaho (Oxbow)
1968	Gnat Creek	23,100	66.0	Skamania
1969	Oak Springs	174,341	145.0	Skamania
1981	Oak Springs	17,558	6.9	Umatilla River
1981	Oak Springs	9,400	149.2	Umatilla River
1982	Oak Springs	59,534	7.6-8.0	Umatilla River
1982	Oak Springs	67,980	123.6	Umatilla River
1983	Oak Springs	60,500	11.0	Umatilla River
1983	Oak Springs	52,700	62.0	Umatilla River
1984	Oak Springs	58,012	6.0-6.9	Umatilla River
1984	Oak Springs	22,005	135.0	Umatilla River
1985	Oak Springs	53,850	7.0	Umatilla River
1985	Oak Springs	39,134	150.0	Umatilla River
1986	Oak Springs	54,137	8.4	Umatilla River
Fall Chinook				
1982	Bonneville	978,336	79.0	Tule
1982	Bonneville	2,559,510	90.0	Tule
1982	Bonneville	290,680	130.0	Tule
1983	Bonneville	100,000	5.6-6.2	Upper River Bright
1984	Bonneville	223,632	8.6-9.3	Upper River Bright
1984	Bonneville	637,190	86.0-87.0	Upper River Bright
1985	Bonneville	3,221,993	85.0	Upper River Bright
1985	Bonneville	198,145	7.0-8.0	Upper River Bright
1985	Bonneville	50,000	16.0	Upper River Bright
1986	Bonneville	90,871	5.0	Upper River Bright
1986	Bonneville	100,000	4.7	Upper River Bright
1986	Bonneville	2,030,000	86.0	Upper River Bright
1986	Bonneville	35,574	11.6	Upper River Bright
Spring Chinook				
1986	Carson	99,970	22.8	Carson
1986	Irrigon	300,442	87.0	Carson
1986	Irrigon	75,000	19.8	Carson

As a result, competition and predation by steelhead are not new effects, but processes natural to the Umatilla system. Predatory behavior, inherent among salmonid populations, can be modified (to a degree) by following accepted smolt release procedures outlined by Evenson et. al., 1981, and listed below:

1) Salmonid smolts should be permitted to voluntarily migrate out of holding (acclimation) facilities. This allows smolts to leave as active migrants and reduces additional in-river rearing.

2) If possible, the release should be made in the evening, to initiate smolt migration before it becomes light enough for feeding.

3) Fish should be well fed immediately before release to reduce potential predation stimulated by increased appetite.

4) If possible, smolt release should occur during a period of increased flow and turbidity to stimulate migration and reduce visibility of the prey to the released fish.

If, however, hatchery steelhead predation on chinook fry becomes an identified problem in the Umatilla, it may be necessary for ODF&W to develop specific measures to deal with steelhead predation. A potential measure could include adjusting Umatilla basin salmonid management, and plant additional chinook to the system to make up for losses attributable to steelhead predation.

To facilitate identification of brood stock upon adult return, hatchery-reared smolts will be marked prior to release. Stock identification will assist in maintaining the genetic integrity of hatchery and wild steelhead populations (there are no wild spring or fall chinook runs) during hatchery brood stock selection. It is possible that fish diseases common to the Umatilla system and the lower Columbia River will be introduced into the Umatilla Fish Hatchery. Introduction of disease can occur through hatchery brood stock. Disease organisms also can be transported from brood stock to the hatchery through equipment used in spawning as well as through the eggs. Introduction of diseases uncommon to the region is unlikely as only Umatilla stock steelhead, Upper River Bright stock fall chinook and Carson stock spring chinook will be incubated and reared at the facility (i.e. stocks that have been planted in the Umatilla in past years). Hatchery disease inspection and treatment programs will be conducted at the hatchery throughout rearing in order to decrease the likelihood of disease.

Normal hatchery operations will likely require the use of several chemicals for the treatment and control of salmonid diseases. The following list of chemicals and drugs likely to be used at the Umatilla Fish Hatchery was supplied by ODF&W (Stratton and Kreps, pers. comm. 1986) and are either registered or authorized for use under an experimental permit (erythromycin) by the Food and Drug Administration (FDA). There are no adverse environmental effects anticipated with use of the chemicals, as they will be handled, applied, and disposed of in accordance with FDA and Environmental Protection Agency (EPA) regulations (Stratton, pers. comm. 1986). The descriptions provided below were taken, in part, from Piper et. al. (1982).

Formalin is one of the most widely used chemotherapeutic agents in fish culture. It is effective against most ectoparasites, but of little value in treating bacterial infections. High concentrations have controlled fungus on eggs. Formalin will be generally used at the Umatilla Fish Hatchery to control ectoparasites, prescribed as a bath treatment at 125 to 250 parts per million (ppm) for 1 hour. Fish exposed to excessive concentrations of formalin can suffer delayed motility.

Potassium Permanganate is used to control external parasites and bacterial infections. It is commonly used by ODF&W to control bacterial gill disease in steelhead and chinook fry. It is best to use 2 ppm and retreat the fish after 24 hours, as Potassium Permanganate can be toxic to fish at higher concentrations.

Oxytetracycline is a broad spectrum antibiotic and will be used at the Umatilla Fish Hatchery as a food additive to control systemic bacterial infections of salmonid fish. Oxytetracycline is typically fed at the rate of 4 grams per 100 pounds of fish per day for 10 days.

Erythromycin is an antibiotic used primarily against bacterial kidney disease. Juvenile hatchery fish which test positive for this disease are treated with erythromycin powder used as a food additive. The antibiotic is mixed with the food to obtain a 5 to 7 percent active ingredient.

Chlorine is commonly used as a hatchery disinfectant. A solution of 200 ppm is effective in 30 to 60 minutes. Chlorine will be used to disinfect hatchery equipment such as dip nets and pond screens. It will also be used to disinfect fish transport tanks. Chlorine is toxic to all fish and must be neutralized before discharge to surface waters. Neutralization can be accomplished by using sodium thiosulfate.

Tricaine Methane Sulfonate (MS-222) is a fish anesthetic. It is used by ODF&W to calm fish during transportation. Fish exposed to a 264 ppm solution of MS-222 require 30 to 45 seconds to become relaxed. ODF&W commonly uses MS-222 at concentrations less than 264 ppm. Fish exposed to this compound will be held the prescribed length of time required for food fish by FDA (14 to 21 days post-treatment).

The use of hatchery drugs and chemicals at ODF&W facilities is conducted only upon direction from a fish pathologist. All drugs are handled and applied by ODF&W employees in accordance with FDA regulations (Stratton, pers. comm. 1986). Empty containers of these chemicals will be disposed of according to label instructions and EPA procedures.

The viral disease infectious hematopoietic necrosis (IHN), which initially attacks the blood forming tissues in the kidney, has caused widespread hatchery mortality in steelhead and fall chinook, altering management of Columbia River stocks in recent years. As a result, ODF&W-operated hatcheries are routinely monitored for IHN as well as other salmonid diseases such as Viral Erithrocitic Necrosis (VEN) which has been detected in Carson spring

chinook. To facilitate disease control, eggs from 1 to 3 females will be isolated at spawning and placed in individual incubation trays. As previously described, groups of four trays will be incubated on an independent water supply, thereby reducing potential cross-contamination of other incubating egg groups. If eggs from an individual female test positive for IHN or VEN, all eggs in that tray will be destroyed. Other eggs incubating in the same 4-tray group will be destroyed also if tested positive for IHN or VEN.

The Umatilla Fish Hatchery, proposed as mitigation for impacts to salmonid populations associated with hydroelectric development in the lower Columbia River, will enhance the summer steelhead and possibly spring and fall chinook populations of the Columbia River system, specifically the Umatilla River. The adult steelhead return resulting from the hatchery-programmed release is expected to be about 5400 fish. The adult chinook return resulting from hatchery releases is expected to be about 7500 fish with final figures being determined through a future master planning process.

The returning adults will supplement the Confederated Tribes of the Umatilla Indian Reservation commercial, ceremonial, and subsistence fishery, as well as the sport fishery. In addition, a portion of the runs will serve as brood stock for the Umatilla Fish Hatchery. Any remaining adults will be allowed to spawn naturally in the Umatilla system, supplementing natural production.

3.3.3 Wildlife

Wildlife habitats in the project vicinity support a rich and abundant animal life. The Umatilla National Wildlife Refuge and the Irrigon Wildlife Area (Figure 1) were created to help compensate for habitats flooded by John Day Reservoir. Private lands in the project vicinity are mostly rural and agricultural, allowing additional wildlife use.

The Umatilla Refuge is managed primarily for waterfowl, other migratory and breeding birds, and related recreation. For the last several years, midwinter waterfowl populations on the refuge have averaged about 500,000 birds (Table 3; Annear, pers. comm. 1986). Mallards comprise a large majority of the population.

Breeding waterfowl populations in the project vicinity are much lower than wintering populations, with an estimated production of 2200 to 2600 young in 1974 and 1975 (Tabor 1976). Mallard and Canada goose are the primary nesting species. Most duck nesting occurs in McCormack Slough, in a marsh near Paterson Slough, and on the Irrigon Wildlife Area (Tabor 1976).

Federally listed bird species in the project vicinity are the bald eagle (threatened), peregrine falcon (endangered), and Swainson's hawk (candidate). The ferruginous hawk (a candidate species), mentioned in the U.S. Fish and Wildlife Service's (USFWS) January 27, 1986, letter as possibly occurring in the area, is a desert inhabitant, and, in fact, is not found in the project vicinity (Annear, pers. comm. 1986).

TABLE 3

TYPICAL MIDWINTER WATERFOWL USE, UMATILLA NATIONAL WILDLIFE REFUGE

SPECIES	NUMBER
Canada goose	2,760
Lesser Canada goose	12,570
Mallard	471,200
Gadwall	100
Wigeon sp.	1,148
Green-winged teal	620
Shoveler	80
Pintail	4,100
Redhead	40
Canvasback	150
Scaup sp.	325
Goldeneye sp.	65
Bufflehead	65
Merganser sp.	69
Coot	150
TOTAL	493,442

Source: Umatilla National Wildlife Refuge, Waterfowl Survey of January 11, 1986.

Bald eagles are present in the project area during winter; peregrine falcons appear briefly during spring and fall migrations. Use of the area by these species is described in the attached Biological Assessment and the supplemental consultation letter on the expansion alternative and upstream site (Appendices B and D). Two pairs of Swainson's hawks were reported to nest in the project vicinity, one at Paterson Slough (approximately one-half mile north of the project sites), the other 7 miles southwest of Irrigon (Tabor 1976).

Other birds in the project vicinity include colonially nesting waterbirds, upland gamebirds, owls, and passerines. Small colonies of double-crested cormorants, great blue herons, and black-crowned night herons nest 3 to 5 miles downstream of the project sites (Tabor 1976). Upland gamebird species potentially using the project sites include ring-necked pheasant, California quail, and mourning dove.

Other animals in the project area include mule deer, aquatic and terrestrial furbearers, small mammals, and reptiles. Deer densities in the project vicinity are generally low. Raccoon and coyote are likely to use upland habitats of the project sites. Small mammals identified in rabbitbrush

habitat type, similar to (but less disturbed) than the project sites, are Nuttall's cottontail, black-tailed jackrabbit, California ground squirrel, Great Basin pocket mouse, Ord's kangaroo rat, western harvest mouse, and deer mouse (Tabor 1976). Possible reptiles inhabiting the sites are sagebrush lizard, racer, and gopher snake.

Hatchery construction would permanently remove 5 to 7 acres of shrub-steppe wildlife habitat from either project site, and temporarily disrupt wildlife use on the remaining acreage. Undetermined numbers of small mammals and reptiles would be killed, injured, or displaced, while birds and larger mammals would shift their activities to avoid disturbances. There would be little or no population impact on more mobile species.

Hatchery construction would have no adverse impact on wintering bald eagles or migrating peregrine falcons (Appendices B and D). Swainson's hawks would be likewise unaffected by the project, as known nesting areas are one-half to several miles away from the hatchery sites. The USFWS has been consulted and concurs with BPA's finding of no effect (Appendices C and E). Onsite construction activities would not be expected to disturb wintering or nesting waterfowl (Annear, pers. comm. 1986), which concentrate at McCormack and Paterson Sloughs and islands on the Umatilla Refuge. These areas are 1/2 to 6 miles away from the project sites.

Increased truck traffic associated with the project would raise noise levels along Paterson Ferry Road. Local waterfowl use in the upper end of McCormack Slough and owl nesting in the nearby Russian olive stand could be temporarily disrupted. Population impacts would be minor.

Low levels of human activity associated with hatchery operation would have no significant impact on any Federally listed species (Appendices B and D). The project, therefore, complies with provisions of the Endangered Species Act of 1973, as amended in 1978. After release, hatchery fish may provide a small added food source for colonially nesting waterbirds, such as gulls, terns, and great blue herons.

3.4 WATER RESOURCES

3.4.1 Floodplains

Federal agencies are mandated under Executive Order 11988 (Floodplain Management) to avoid, to the extent possible, the long-term and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development whenever there is a practicable alternative.

Development of the Umatilla Fish Hatchery will result in only the hatchery water discharge structure being located within the 100-year floodplain, which reaches 268 feet MSL in the vicinity of the sites (McGowan, pers. comm. 1986; Federal Emergency Management Agency 1981). The discharge structure will be located within the floodplain to facilitate a gravity flow hatchery water

system, which is accepted by ODF&W as the most desirable and dependable type of hatchery water distribution system for this project. BPA has determined that an outfall in the Columbia River is the only practicable wastewater disposal alternative. The discharge facility will be designed and constructed to withstand and to operate during a 100-year flood.

Construction of the proposed Umatilla Fish Hatchery will result in disturbance of about 300 square yards of river bank adjacent to John Day Reservoir. Construction activities in this area will be limited to ground preparation necessary for installation of the hatchery water discharge structure. The majority of the discharge structure will be located above 265 feet MSL, the normal pool elevation of John Day Reservoir. Only the end of the discharge structure and a small riprap ditch will be constructed below 265 feet MSL (Figures 3 and 4). The discharge structure will be constructed while the reservoir surface elevation is below the area of construction, thereby facilitating dry construction. The discharge structure is relatively small, 25 feet long and 10 feet wide, and will not require extensive excavation. All excavated materials will be used for fill and leveling on the uplands of the site above the 100-year floodplain. Riprap will be placed at the mouth of the discharge pipe to eliminate scouring of the river bank during operation.

Flow records for the Columbia River just below McNary Dam for the years 1950-1974 show a monthly average range of 103,968 to 440,975 cfs with an annual monthly average of 187,268 cfs. Hatchery operation will result in a maximum 30-31 cfs additional discharge to John Day Reservoir. This increase is not considered significant in terms of total river flow and will not impact the flood control capabilities or floodplain characteristics of John Day Reservoir (McGowan, pers. comm. 1986). As a result, the Umatilla Fish Hatchery will have no detrimental effect on human life, property, or natural floodplain qualities as pertains to Executive Order 11988.

3.4.2 Water Quality

The proposed Umatilla site is located on the shore of the Columbia River 14 miles downstream of McNary Dam (Figure 1). The US Geological Survey (USGS) has a sampling station at Richland, Washington, about 62 river miles upstream of the site. Data on selected water quality parameters from this site are shown in Table 4. The Columbia River is designated, in accordance with water quality standards for waters of the State of Washington, as a Class A water in the segment that passes through Richland. Class A waters in Washington, second only to Class AA waters, possess excellent water quality and meet or exceed the requirements for all or substantially all uses including use as a domestic water supply.

During daily operation, effluent from the hatchery will be discharged to the Columbia River via the hatchery outfall pipeline. The volume discharged will vary throughout the year depending upon the age and water requirements of the fish. Flow through the hatchery will range from a minimum of 60 gpm to a maximum of 14,000 gpm (30-31 cfs) for the expanded hatchery and half that much for the no-expansion alternative (Stratton and Boyce, pers. comm. 1986).

Table 4. Selected water quality data from the Columbia River measured near Richland, Washington. USGS, 1985.

Date	Temperature (°C)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Fecal Coliform (#/100mL)	pH
Nov. 13, 1981	12.0	1.2	10.0	74	1	35	7.3
Jan. 5, 1982	4.5	0.60	12.0	89	11	<1	7.8
May 3, 1982	9.0	3.1	12.0	88	5	2[a]	7.8
July 6, 1982	15.5	3.5	11.3	69	6	5[a]	7.8

a Results based on non-ideal colony counts.

The effluent will contain fish wastes and suspended unconsumed food and will represent a loading of solids, biochemical oxygen demand (BOD), and ammonia nitrogen to the Columbia River. Calculations for figuring the amount of this loading for the Umatilla Fish Hatchery have been performed for a maximum amount of hatchery discharge, i.e. 30-31 cfs (expansion alternative). Most of the figures below could be divided by 2 to determine the approximate loading amounts for the no-expansion facility.

A report prepared by ODF&W (Leith 1976) found that for conventional raceways approximate effluent concentrations were 1.02 to 1.71 milligrams per liter (mg/l) BOD, and 0.12 to 0.32 mg/l ammonia nitrogen. Assuming maximum concentrations of these constituents, and a maximum effluent discharge rate from the hatchery of 30 cfs, the loading to the Columbia River would be 276 pounds per day (lb/d) BOD, and 52 lb/d ammonia. These concentrations and loadings are low and would not result in a measurable change in concentrations in the river. The discharged effluent represents only 0.03 percent of the river flow under maximum monthly hatchery flow rates and minimum monthly river discharge, and therefore would be highly diluted. Consequently, the impact of the discharge on water quality in terms of BOD, and ammonia in the Columbia River is expected to be insignificant and undetectable by current methods (Michaud and McEntee, pers. comm. 1986).

According to calculations for the Irrigon Hatchery (Corps 1983), a salmonid hatchery located just upstream of the proposed Umatilla Fish Hatchery, the total suspended solids generated was estimated to be 0.483 pounds per 100 pounds of fish per day. At a maximum production of 160,000 fish, 773 pounds of suspended solids will be generated per day for the proposed Umatilla Fish Hatchery. Fifty percent of the solids are expected to settle out in the rearing ponds, which would leave approximately 387 pounds of suspended solids to be discharged to the Columbia River on a daily basis from normal hatchery operations. A portion of the solids that settle out in the hatchery rearing ponds will be released during weekly cleaning of the ponds.

During cleaning, sediment in the ponds is flushed to a concrete-lined sedimentation basin that has a minimum detention time of 2 hours. Ninety percent of the suspended solids should "settle out" in the sedimentation basin, while the remainder will flow into the river with the discharge water (Corps 1983). This would result in an additional contribution of suspended solids from cleaning of the rearing ponds of 38.7 lb/d. Thus, the maximum discharge of suspended solids to the Columbia River from the Umatilla Fish Hatchery will occur during maximum production, and is estimated to be approximately 425 lb/d. This 425 lb/d corresponds to a suspended solids concentration in the hatchery discharge water of 5.25 mg/L assuming a maximum discharge of 30 cfs.

The Federal Water Pollution Control Act (33 USC 1251 et seq.) and amendments, including the Clean Water Act (33 USC 1344), set forth the national strategy for controlling water pollution. The Act requires States to establish and enforce water quality standards and also establish a National Pollutant Discharge Elimination System which requires a permit for point source

discharges. An NPDES permit is needed for the Umatilla Fish Hatchery discharge and must be acquired through the Oregon Department of Environmental Quality (DEQ). The permit requirements are:

Settleable Solids:	Monthly Average = 0.1 milliliters per liter (ml/l)	
	Instantaneous Maximum = 0.2 ml/l	
Total Suspended Solids:	Monthly Average = 2 kilograms (kg)/100 kg Fish	
	Allowable Daily Average = 2.5 kg/100 kg Fish	
	Instantaneous Maximum = 15 millograms per liter (mg/l)	
pH	Range = 6 - 9	

The proposed hatchery's effluent will have to be within the above NPDES permit amounts. The permit requires that settleable and suspended solids be monitored during the highest production periods. The estimated concentration of suspended solids, 5.25 mg/l correlates to 0.26 kg/100 kg fish, and is well below the permit requirements. Since settleable solids represent a fraction of the suspended solids, both of these permit requirements will easily be met. DEQ does not require monitoring of pH. However, the pH range recommended for the rearing of salmonids is 6.5 to 9 (Piper et. al. 1982) and within the DEQ permit requirement. Water quality monitoring of the groundwater supply currently in use at the Irrigon Hatchery and proposed for use at the Umatilla Fish Hatchery, revealed a pH of 7.6. Operation of the Umatilla Fish Hatchery will maintain the pH within the accepted range due to the two-pass flow-through design of the water supply system and adherence to accepted salmonid rearing densities as discussed in sections 2.3.1 and 2.3.2 (Stratton and Boyce, pers. comm. 1986). Consequently, the hatchery will meet or exceed all applicable regulations of the Federal Water Pollution Control Act.

In summary, estimates of BOD, ammonia, and solids released to the Columbia River indicate that no discernible degradation in water quality will occur as a result of the hatchery discharges.

Requirements of the Safe Drinking Water Act (42 USC 300f et seq.), which includes protection of sole source aquifers, do not pertain to this project since the proposed project will not serve as a public, municipal, or industrial drinking water supply. As a result, this project does not require a public drinking water permit. In addition, the project site is not located on, nor will it impact, a designated sole source aquifer (see section 3.4.3).

Impacts to surface waters may also occur during site construction. Disruption of the land surface and vegetation will cause an increase in water and wind erosion potential from the site. Erosion by runoff water is expected to be minimal due to the dry climate of eastern Oregon and the permeability of the sandy soils. Erosion through wind activity will be minimal due to the small amount of land disrupted (approximately 5 to 7 acres). Nonetheless, BPA will stipulate in its construction contracts that wetting the site with sprinklers during the construction period is to be undertaken to control wind driven erosional activities.

Construction of the hatchery water discharge structure will require Corps permits authorized by Section 10 of the River and Harbor Act (33 USC 403), and Section 404 of the Clean Water Act (33 USC 1344). The Section 10 permit is required when project development will obstruct or alter navigable waters of the United States. Since the Columbia River is a navigable river at the project sites, a Section 10 permit will be required. The Section 404 permit is necessary for the discharge of dredged or fill material into waters of the United States. Since fill material could be discharged into the Columbia River, a Section 404 permit will be required. These permits have requirements and conditions designed to protect water quality and utilization of water resources.

Construction of the outfall pipe could affect water quality through disruption of the shoreline, increased turbidity, and increased potential for construction materials to enter the river. Project development, however, will disturb less than 300 square yards of the river bank, with the majority of construction above the normal pool elevation of John Day Reservoir. Riprap will be installed at the terminus of the outfall to dissipate energy of the discharged water and thereby minimize potential riverbed erosion. All outfall construction activities will be conducted in accordance with the requirements and conditions of the Corps Section 10 and Section 404 permits and construction time will be kept to a minimum. In addition, the relatively small amount of river bank disturbance (less than one-half of 1 percent of the shoreline of John Day Reservoir), the location of the outfall structure in the upper reaches of the river bank, and dry construction of the outfall will all serve to alleviate potential adverse impacts to water quality and navigation of the Columbia River.

The increase in impermeable surface area (approximately 1 to 2 acres) that will occur from construction of the facilities will result in little increased runoff potential from the site. The runoff should be absorbed due to the small area affected and permeability of the surrounding soils (McDowell, pers. comm. 1986).

3.4.3 Water Quantity

Due to the semi-arid climate in eastern Oregon, water supplies are a major concern. Planning for water demand must take into account the requirements for irrigation, power generation, recreation, and biological resources. The location of the proposed Umatilla Fish Hatchery is considered to be a "critical groundwater area" as established by order of the Oregon Water Resources Department (Zwart, pers. comm. 1986). As a result, the deep groundwater aquifer in the Irrigon area is protected to guard against over-pumping (McDowell, pers. comm. 1986; Zwart, pers. comm. 1986).

A maximum water supply rate of approximately 14,000 gpm (30-31 cfs) is required for hatchery operations. A water supply study done for the Umatilla site considered a number of alternatives for obtaining the water (Corps 1986). The selected alternative entails constructing a Ranney well system near the proposed site. A Ranney well consists of one large well with a

number of lateral extensions at the bottom that draw water from a large circumference area around the well. The proposed well system will draw water from the soil overburden and not from the deeper (basalt layer) protected aquifer, and therefore will not impact aquifer water supplies. Two of these Ranney wells are currently in use at the Irrigon Hatchery 1/4 mile upstream. Proof that the well water is not from the deeper aquifer is evidenced by the temperature and water level fluctuations, which follow fluctuations of the Columbia River (Dribble, pers. comm. 1986).

The water supply study indicated that an adequate supply of water could be obtained from this well. A slight drawdown (approximately 3 to 4 feet) of water will occur locally in the upper (overburden) aquifer when this well and the western-most Irrigon Hatchery well are both pumping at maximum capacity. This is not considered a significant impact on the upper aquifer since this aquifer is constantly replenished by the Columbia River. Also, the closest domestic wells, approximately 1/2 to 1 mile upstream, would not show any measureable effect from this additional well (McDowell, pers. comm. 1986).

A water supply is also necessary to provide for domestic needs for hatchery personnel. The current plan is to either tie into the existing Irrigon Ranney well or to drill a small domestic well onsite. Less than 180 gpm would be required for domestic use. This increase is not expected to cause an impact to the upper aquifer (McDowell, pers. comm. 1986).

To assure protection of domestic water supplies, a DEQ site evaluation is required for all residential wastewater systems. Prior to development of residential wastewater systems at the Umatilla Fish Hatchery site, a DEQ site evaluation will be conducted and a report prepared. The DEQ report will describe the type of residential wastewater system most appropriate for the site as well as the best location for that system. Adherence to the site evaluation report is required by DEQ (and will be stipulated in BPA's contractor agreement) to assure the protection of groundwater and surface water systems (Gardels, pers. comm. 1986).

The only regulation applicable to development of the domestic water supply is that the well drilling contractor be certified by the State of Oregon (Gardels, pers. comm. 1986). No private water supplies would be impacted by the project because the deeper aquifer would not be affected.

A water rights permit for extracting and using groundwater will be needed for the project and will be coordinated through the Oregon Water Resources Department.

3.5 AIR QUALITY AND NOISE

3.5.1 Air Quality

The proposed Umatilla Fish Hatchery is located in a DEQ-designated air quality attainment area (Gardels, pers. comm. 1986). Attainment areas are characterized as regions which meet or exceed primary and secondary air

quality standards. Ambient air quality standards have been adopted in the State of Oregon to protect the public health and welfare from the known adverse effects of air pollution. The Federal Government has set primary standards which define levels of air quality that protect the public health. Secondary ambient air quality standards define levels judged by the Federal Government to be necessary to protect the public welfare. Oregon's control strategies have been directed to meet the more stringent secondary air quality standards. Presently, the project vicinity easily meets primary and secondary standards (Gardels, pers. comm. 1986).

The proposed hatchery operation will not have a stationary emissions source nor is it located in a DEQ-designated airshed; therefore, project development is not regulated by the Clean Air Act, National Ambient Air Quality Standards, or EPA-approved State Implementation Plans (Gardels, pers. comm. 1986).

There will be exhaust emissions at the hatchery site resulting from operation of heavy equipment during hatchery construction and use of hatchery vehicles during facility operations. Equipment operation during construction will be on a noncontinuous basis over a 9- to 12-month period. Potential use of wood burning stoves in hatchery residences is also a potential source of emissions. The motor vehicle emission control standards and the Oregon State woodstove certification regulations, however, require emissions from such products to be within established limits to maintain accepted air quality standards (Kircher, pers. comm. 1986). BPA's contracts providing funding for hatchery construction and operation will require equipment to be operated and maintained so as to minimize exhaust emissions. As a result, proposed hatchery construction and operation is not expected to alter the current DEQ attainment area designation in the project vicinity (Gardels, pers. comm. 1986).

3.5.2 Noise

The DEQ regulations designate residences, schools, churches, and hospitals as noise-sensitive locations (Hector, pers. comm. 1986). The nearest residences, located at the Irrigon Hatchery, are approximately 1/2 mile east of the proposed project site. There are no schools, churches, or hospitals in the vicinity of the project site which would experience noise impacts from hatchery construction or operation.

Hatchery construction will generate noise associated with heavy equipment operation, well drilling, and land clearing activities. Noise levels in the immediate vicinity of the project site will increase during construction activities.

Construction-related noise associated primarily with well drilling will, to an unknown extent, disturb overwintering waterfowl populations in the project vicinity (Annear, pers. comm. 1986). Well drilling is expected to take place in the summer months during daylight hours, and therefore noise emissions are not expected to adversely impact local wildlife populations (Annear, pers. comm. 1986).

Noise emissions associated with construction activities are exempt from DEQ Noise Control Regulations (Hector, pers. comm. 1986). In addition, the regional DEQ representative reports that there have been no complaints associated with well drilling (the primary construction noise source) over the last 10 years, and he does not expect construction activities to result in significant noise emission (Gardels, pers. comm. 1986).

There will be no adverse noise impacts from hatchery operation, since no noise-emitting source is planned as part of the project. Proposed hatchery construction and operation will not impact designated noise-sensitive locations; therefore, the project will conform to DEQ noise standards.

3.6 SOLID WASTE AND HAZARDOUS MATERIALS MANAGEMENT

3.6.1 Solid Waste

Hatchery operation will generate domestic sewage, solid waste, and fish waste. Septic tanks and drainfields will be constructed for each hatchery residence and the main hatchery building for disposal of domestic sewage. Contents of the septic tanks will be periodically pumped out by a licensed contractor and disposed of at a local sewage treatment plant. A local drop box will be used for disposal of solid wastes. Under normal hatchery operations approximately 300 to 500 pounds for the no expansion alternative and 900 to 1900 pounds for the expansion alternative of dead fish and eggs will be generated at the proposed hatchery each year (Stratton, pers. comm. 1986). Dead fish and eggs will be treated as solid waste and disposed of as such. This manner of fish carcass disposal is consistent with DEQ standards (Gardels, pers. comm. 1986). Solid waste will ultimately be disposed of at the nearby Hermiston landfill, an approved DEQ facility (Gardels, pers. comm. 1986).

Routine hatchery operations will result in generation of fish feces and unconsumed fish food. The majority of these fish wastes will settle to the bottom of the rearing tanks and ponds, with a small percentage remaining suspended and discharged to the Columbia River (see section 3.4). Through routine hatchery cleaning practices, waste products accumulating in rearing structures will be pumped to the hatchery settling basin. The basin will provide detention of pond cleaning effluent and allow fish wastes to settle out of the water column.

Wastes which accumulate in the settling basin will undergo biological degradation, but may also require periodic removal and disposal (once every 5 to 10 years). This waste material may be suitable for agricultural fertilizer, and could be disposed of by offering it to local farms or applying it to hatchery land. Alternatively, it can be placed in a certified landfill (Stratton, pers. comm. 1986; Gardels, pers. comm. 1986).

3.6.2 Hazardous Materials

Normal hatchery operation will require the use of several chemicals classified as medicines for fish disease prevention and control. These substances

include formalin, potassium permanganate, erythromycin, and oxytetracycline and are FDA approved or permitted for experimental use. Medicines and drugs will be handled and applied at the Umatilla Fish Hatchery in accordance with FDA requirements and only upon direction from a fish pathologist (Stratton, pers. comm. 1986).

Tricaine methane sulfonate (MS-222), a fish anesthetic, and chlorine (obtained in the granular form as sodium hypochlorite or HTH) are also likely to be used at the Umatilla Fish Hatchery. MS-222 is FDA approved and used primarily during the transport of fish. MS-222 is used in accordance with FDA requirements to calm fish and reduce stress during their transport from the hatchery to the acclimation facility (Stratton, pers. comm. 1986). Chlorine is likely to be used on a limited basis primarily for disinfecting hatchery equipment. Due to its toxicity to fish, chlorine use will be carefully monitored by the Umatilla Fish Hatchery manager to prevent discharge to hatchery or surface water systems. Chlorine solutions can be dechlorinated and safely disposed of if necessary (Piper et. al. 1982).

It is unlikely hatchery operation will require use of herbicides and pesticides for grounds maintenance or other purposes. ODF&W prefers mechanical eradication of nuisance species (weeds, mice, etc.), and only in extreme cases would pesticides be used (Stratton, pers. comm. 1986). If use of a herbicide or pesticide was required at the Umatilla Fish Hatchery, a readily available EPA approved product (such as Monsanto's Roundup) would be used. There is no anticipated adverse impact associated with herbicide or pesticide use or the above-mentioned chemicals since the use, storage, and disposal of these products and their containers will be in accordance with EPA or FDA regulations and instructions on product labels.

3.7 ARCHEOLOGICAL AND CULTURAL RESOURCES

A number of Federal laws and regulations have been promulgated to protect the nation's historical, cultural, and prehistoric resources. These include the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List.

The National Historic Preservation Act and the Archeological Resources Protection Act safeguard historical and archeological resources from damage or loss to Federally sponsored or permitted projects and from excavation or removal from Federal and Indian lands. The American Indian Religious Freedom Act assures that Federal activities do not impair access to religious sites and will not affect ceremonial rites of American Indians.

Pursuant to the National Historic Preservation Act, the effects of any Federal or Federally assisted undertaking on historical, cultural, or archeological resources must be evaluated. For properties on or eligible for the National Register of Historic Places, the responsible Federal agency must consult with the State Historic Preservation Office (SHPO) regarding any potential adverse effects on resources of historic, architectural, archeological, or cultural significance.

Consultation with the Oregon SHPO has revealed that there are no known properties within the area of the proposed activities included on the National or State Register of Historic Places, or the National Registry of National Landmarks. The project sites are not listed as a National Historic Landmark nor are they on the World Heritage List. Also, there would be no effect on access to religious sites or to ceremonial rites of Native Americans (Kordatzky, pers. comm. 1986). However, archeological sites potentially eligible for listing were known to exist at both hatchery sites being considered. The SHPO recommended that a cultural resource intensive survey be done of the project area prior to construction. After further consultation with the Corps, Portland District, BPA discovered that the Corps had already performed a reconnaissance survey of the sites but further testing was recommended.

BPA contracted with Archeological and Historical Services (AHS) in May 1986 for the downstream site and December 1986 for the upstream site to perform extensive subsurface testing. The Confederated Tribes of the Umatilla Indian Reservation, the Corps Portland District, and the Corps Walla Walla District were consulted regarding performance and the outcome of this testing (Kordatzky, Martin, Leier, pers. comm. 1986). AHS has drafted a report documenting the results of the archeological testing at both sites which concludes that the sites contain relatively low densities of artifacts and that the sites are not considered eligible for inclusion on the National Register. In addition, no further testing is recommended. After consideration of the testing results, BPA has determined that hatchery construction and operation at either site location will not affect any known archeological or historical site and that no further testing for cultural materials is necessary. The Oregon SHPO and the above-mentioned involved agencies have concurred with this finding. A copy of the SHPO's concurrence letter for the downstream site is in Appendix D. The SHPO has given his verbal concurrence to BPA's finding for the upstream site and a letter is forthcoming.

If, after construction has started, BPA should discover the project will have an effect on a previously unidentified but eligible property, BPA will fulfill its responsibilities under 36 CFR Part 800 of the National Historic Preservation Act by suspending work in the area of the impact, consulting with the SHPO and other involved agencies to assess the significance of the resource, and developing mitigation measures if warranted. Should any archeological resources be identified, BPA would comply with requirements of the Archeological Resources Protection Act of 1979 which protects archeological resources on publicly owned and Indian lands.

3.8 PERMIT PROCESS

Development of the Umatilla Fish Hatchery will require permits from the Corps of Engineers, Oregon Division of State Lands (DSL), Oregon Water Resources Department (WRD), Oregon DEQ and Morrow County. In addition, a DEQ water quality certification, which fulfills requirements of the Federal Water Pollution Control Act, will be provided as part of the DSL permit. To coordinate the permit process a Joint Application For Permit is filed with the Corps and the DSL.

Upon receipt of the Joint Application, a determination of jurisdiction will be made. Since Department of the Army authorization is required for certain structures and work in navigable waters of the United States, and for discharge of dredged or fill material in all waters of the United States (see section 3.4.2), the Corps will likely assume jurisdiction. As a result, the Corps will initiate notification of Federal agencies, while the DSL initiates Statewide public notice, including notification of State agencies. Following a 30-day comment period, the Corps will act on the application. Upon approval, the Corps will issue a Department of Army Section 10/404 permit for the necessary dredge and fill operations, and the DSL will issue a State Removal/Fill Permit, including water quality certification. If denied, the applicant will have to modify the proposal to incorporate appropriate measures which address those concerns related to permit denial. A revised Joint Application for Permit can then be submitted.

The NPDES permit, issued by DEQ for hatchery effluent discharge, can be issued in the form of a general permit not subject to renewal, or as an individual permit subject to renewal every 5 years. This determination is made by DEQ during the permit review process.

A Morrow County building permit, which includes electrical, mechanical, and plumbing permits, will also be required prior to initiation of hatchery construction.

The proposed action will not require a Federal land managing agency permit because the Corps of Engineers is not required to issue such permits. A water rights permit will be required for the hatchery and will be coordinated through the Oregon Water Resources Department.

Chapter 4

RECOMMENDATIONS

Development of the proposed Umatilla Fish Hatchery, under either capacity alternative or at either site, will result in the following adverse effects, discussed previously in this document, and listed below in order of decreasing importance:

- Potential hatchery steelhead predation on other fish, including chinook fry, inhabiting the Umatilla River.
- A point source discharge, requiring an NPDES permit, of 15 or 30 cfs of hatchery water to the Columbia River.
- Permanent removal of 5 to 7 acres of shrub-steppe wildlife habitat resulting in the displacement or killing of undetermined numbers of small mammals and reptiles.
- Potential temporary disturbance of wildlife of the project vicinity (including the Umatilla Wildlife Refuge) as a result of hatchery construction noise emissions.
- Preclusion of County's use of the deep water access if hatchery were located at the downstream site (not the preferred site alternative).
- Increase in local traffic volumes associated with hatchery construction and operation.

These impacts from construction and operation of the proposed Umatilla Fish Hatchery are not considered significant for reasons discussed in chapter 3 of this assessment.

In addition, hatchery development will result in beneficial impacts to the summer steelhead and possibly spring and fall chinook populations of the Umatilla River. For the no-expansion alternative, the adult steelhead return resulting from Umatilla Fish Hatchery smolt releases is expected to be approximately 5400 fish. For the expansion alternative, the 5400 steelhead would be expected to return in addition to 7500 adult chinook. Given the regional context of the NWPPC's Fish and Wildlife Program, these numbers of adult salmonid fish returning to the Umatilla basin annually are not expected to have significant environmental effects. In conclusion, the Umatilla Fish Hatchery will serve as mitigation for impacts associated with lower Columbia River hydroelectric development to Umatilla River summer steelhead and chinook stocks. The project will also serve to further the goals of the Columbia River Basin Fish and Wildlife Program.

Based on the information in this Environmental Assessment, BPA's proposal to fund construction, operation, and maintenance of the Umatilla Fish Hatchery does not appear to constitute a major Federal action significantly affecting the quality of the human environment.

Chapter 5

CONSULTATION AND COORDINATION

Federal, State, and local agencies consulted during preparation of this Environmental Assessment include:

City of Irrigon

Confederated Tribes of the Umatilla Indian Reservation

East Central Oregon Association of Counties

Federal Emergency Management Agency

Morrow County Planning and Public Works Departments

Oregon Department of Environmental Quality
- Water Quality Division
- Air Quality Division
- Noise Pollution Control
- Permits Division
- Regional Office, Pendleton

Oregon Department of Fish and Wildlife
- Fish Propagation Division/Fish Pathology Division
- Regional Office, Pendleton
- Field Office, Umatilla

Oregon Division of State Lands
- Permits Division

Oregon State Historic Preservation Office

Oregon Water Resources Department
- Permits Division

U.S. Army Corps of Engineers
- Walla Walla, Washington, District
  - Engineering
  - Geology/Hydrology
  - Environmental & Archeological
- Portland, Oregon, District
  - Floodplains
  - Environmental & Archeological
  - Permits

U.S. Fish and Wildlife Service
- Umatilla National Wildlife Refuge Office
- Endangered Species Section, Portland Field Office

Chapter 6

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APPENDIX A

USFWS CONSULTATION LETTER

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Office
727 N. E. 24th Avenue
Portland, Oregon 97232

SE:dh

January 27, 1986

Rose Hayden
Bonneville Power Administration
P. O. Box 3621 Routing PGC
Portland, Oregon 97208

Re: 1-7-86-SP-65

Dear Name:

As requested by your letter dated January 3, 1986 and received by us on January 15, 1986, we have attached a list of endangered and threatened species that may be present within the area of the proposed summer steelhead trout hatchery near Irrigon, Oregon. The list fulfills the requirement of the Fish and Wildlife Service under Section 7(c) of the Endangered Species Act of 1973, as amended. Your requirements under the Act are outlined in Attachment B.

Should your biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, your agency should request formal Section 7 consultation through this office. Even if your biological assessment shows a "no effect" situation, we would appreciate receiving a copy for our information.

We have also included a list of candidate species presently under review by this Service for consideration as endangered or threatened. It should be noted that candidate species have no protection under the Endangered Species Act. Should you determine your project may affect candidate species, you are not required to perform a biological assessment or to consult with the Fish and Wildlife Service. Candidates are included simply as advance notice to Federal agencies of species which may be proposed and listed in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, you may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. If you have any additional questions regarding your responsibilities under the Act, please contact Diana Hwang at our office, phone (503) 231-6179 or FTS 429-6179. All correspondence should include the above referenced case number

Sincerely yours,

Attachments

for Russell D. Peterson
Field Supervisor

cc:
RO (AFA/SE)
PFO (ES)
BFO (SE)
ODFW (Nongame)
ONHP

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED TROUT HATCHERY NEAR IRRIGON, MORROW COUNTY, OREGON
(T5N R26E SEC. 15)
1-7-86-SP-65

LISTED:

Bald Eagle (*Haliaeetus leucocephalus*) (T)
Wintering eagles occur along the Columbia River at Umatilla NWR from about October 31 through March 31.

PROPOSED: None

CANDIDATE:

Birds

Swainson's hawk	(*Buteo swainsoni*)	(2)
Ferruginous hawk	(*Buteo regalis*)	(2)

(E) -Endangered (T) -Threatened (CH) - Critical Habitat
(1) -Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2) -Category 2: Taxa which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

Attachment A

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species: and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Construction Projects 1/

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which are/is likely to be affected by a construction project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species: (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevent information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

1/ On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

APPENDIX B

BIOLOGICAL ASSESSMENT

Proposed Action:
Construction and Operation of a Summer
Steelhead Hatchery on the Columbia River
near Irrigon, Oregon

Species of Concern:
Bald Eagle (*Haliaeetus leucocephalus*)
Peregrine Falcon (*Falco peregrinus anatum*)

Bonneville Power Administration
Office of Power and Resources Management
Portland, Oregon

April 1986

BALD EAGLE AND PEREGRINE FALCON BIOLOGICAL ASSESSMENT
UMATILLA SUMMER STEELHEAD HATCHERY
MORROW COUNTY, OREGON

Introduction

Section 7 of the Endangered Species Act of 1973 (as amended) requires Federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. To initiate a project, a Federal agency first requests a list of proposed or listed species from the U.S. Fish and Wildlife Service (USFWS). If such species exist in the project area, the agency or its designee must complete a Biological Assessment (BA) describing how the project would affect the species. If the BA shows that the project would be likely to affect the species (either adversely or beneficially), the agency must consult with the USFWS to ensure that such species and their critical habitats would be conserved.

The Bonneville Power Administration (BPA) has identified a site on the Columbia River near Irrigon, Oregon, as the preferred location for the Umatilla Summer Steelhead Hatchery. On January 3, 1986, BPA requested information from the USFWS on proposed or listed endangered or threatened species in the project area. The USFWS responded on January 27, 1986, listing the bald eagle (*Haliaeetus leucocephalus*), a threatened species, wintering near the project site on the Umatilla National Wildlife Refuge. Subsequent talks with Refuge personnel also identified the peregrine falcon (*Falco peregrinus anatum*), an endangered subspecies, as an occasional migrant in the project area.

This Biological Assessment examines the potential effects of the hatchery project on bald eagles and peregrine falcons.

Study Methods

An onsite field survey was made on March 11, 1986, in conjunction with an Environmental Assessment of the project. The survey included a search of the project area for potential bald eagle and peregrine falcon roosting and perching sites (large trees and snags), and resting and feeding sites (sand and gravel bars, islands, open fields, and marshes). Local vegetation, wildlife, and human activities were also identified. Survey information was used to augment existing data on bald eagle and peregrine falcon use.

Literature on bald eagle and peregrine falcon feeding habits, abundance, and distribution in Washington and Oregon was reviewed. Aerial photos of the project vicinity (Tabor 1976) were inspected to identify potential habitats. Local and regional experts from the USFWS, U.S. Army Corps of Engineers (Corps), Oregon Department of Fish and Wildlife (ODF&W), Washington Department of Game (WDG), and Chelan County PUD No. 1 were interviewed for unpublished information on the species, and opinions on impacts of the proposed project.

Description of Proposed Action

The location of the proposed Umatilla Summer Steelhead Hatchery is in Morrow County, Oregon, about 3 miles west of Irrigon (Figure B-1). The site borders the Columbia River (John Day Reservoir) at river mile 278.5 and is next to the Umatilla National Wildlife Refuge. It is bounded by roads on its south and west sides, and a public boat launch on the east side. The site is currently leased from the Corps by Tidewater Barge Company. The Morrow County Grain Growers elevator is 1/4 mile west (downstream) of the project site. The Irrigon Hatchery is 1/2 mile upriver.

The project site lies within the shrub-steppe region of the Columbia Basin province, described by Daubenmire (1970) and Franklin and Dyrness (1973). Soils and vegetation on the site are disturbed, having been impacted by uncontrolled vehicle access, grazing, and former use as a munitions transport terminal. The site is presently used for camping and river access by sturgeon fishermen. Most angler use occurs outside of winter.

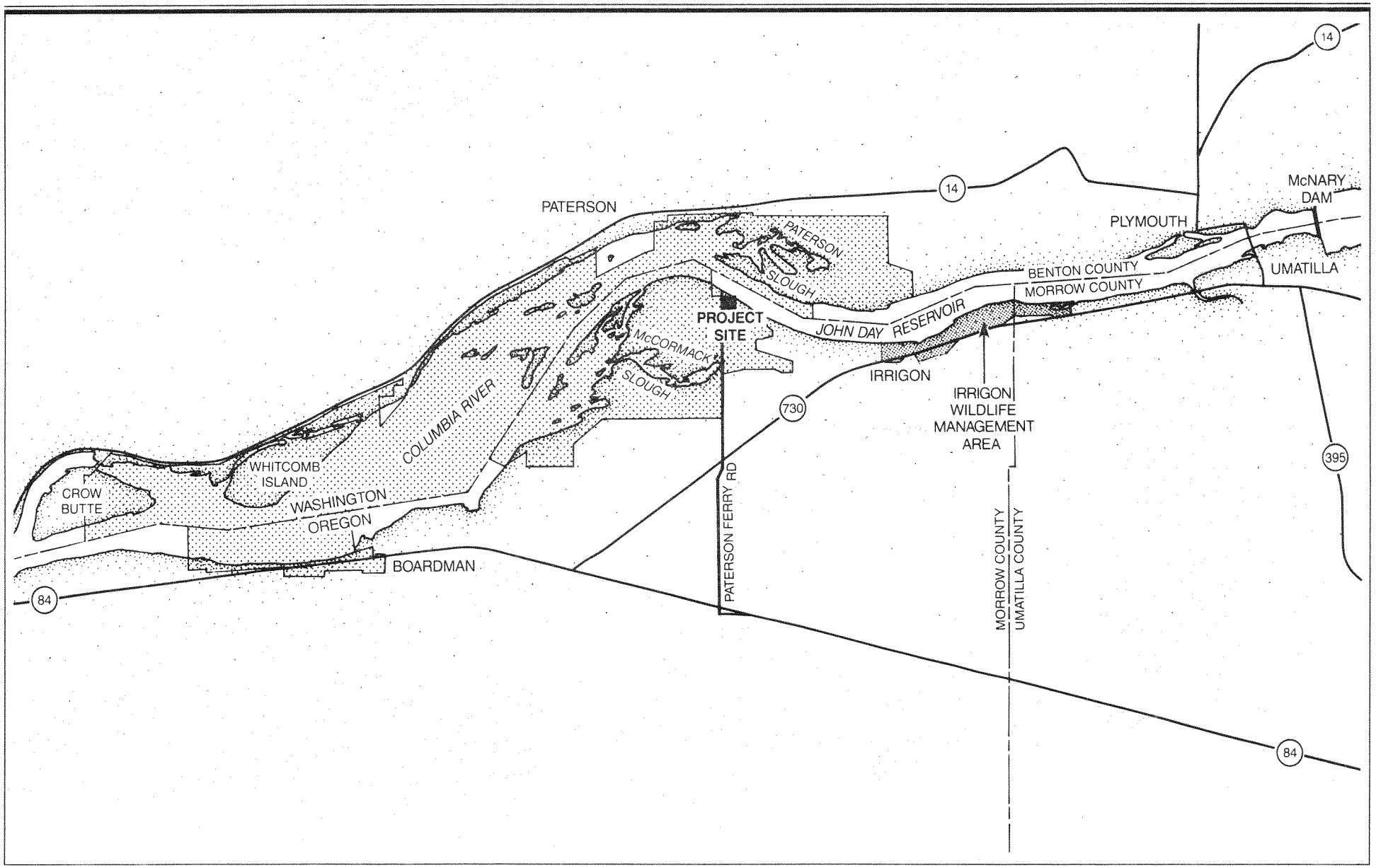
Onsite vegetation consists of gray rabbitbrush, Russian thistle, starvation cholla, and mixed grasses and forbs. The nearest trees (a row of black locust) are about 1500 feet south of the project near the Umatilla Refuge. The site is gently sloped (270 to 285 feet mean sea level), and is perched several feet above a cobble and sand beach. There is no distinctive riparian vegetative zone.

BPA will fund construction and operation of the proposed hatchery. ODF&W will manage and operate the facility. The facility will occupy 5 to 6 acres, and will include a hatchery building, rearing ponds, settling basin, and employee residences. A paved access road and visitor parking areas are also planned. Hatchery water will be supplied by a Ranney groundwater collection system to be located just west of the project site. Wastewater will be discharged to the river.

The proposed hatchery program will rear 200,000 summer steelhead smolts for release into the upper Umatilla River system. Final rearing and smolt release will occur at the Bonifer Srings and Minthorn Springs juvenile acclimation ponds near the headwaters of the Umatilla River. Hatchery operation will generally involve low levels of human activity, with a slight increase during the transfer of fish to acclimation ponds in February and March.

Hatchery broodstock will initially be native adult summer steelhead collected at Three Mile Falls Dam on the lower Umatilla River. After the hatchery run is established (about 1990), adults will be collected at the smolt release facililties.

Release of 200,000 summer steelhead smolts is expected to return 5,400 adult summer steelhead to the Umatilla River system (Boyce 1986). After broodstock collection, the rest of the run will be available for harvest and natural spawning within the system.



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Umatilla National Wildlife Refuge

Figure B-1
Project vicinity map.

Study Results

Bald Eagle

Bald eagles winter along the Columbia River from November through March. Monthly surveys in eastern Washington have shown that eagles generally reach peak numbers in February. The number of bald eagles wintering in eastern Washington nearly doubled between 1974 and 1984 (Fielder and Starkey 1986).

Eagles wintering in eastern Washington feed primarily on waterfowl, upland birds, carrion, and to a lesser extent fish (Fielder and Starkey 1986). Wintering eagles are often transient, using an area until food becomes scarce, and then moving on to a new food source. This is especially true of subadult birds, which lack the hunting skills of adults (Fielder 1986). Areas rich in food apparently attract a high proportion of subadult eagles (Fielder 1982).

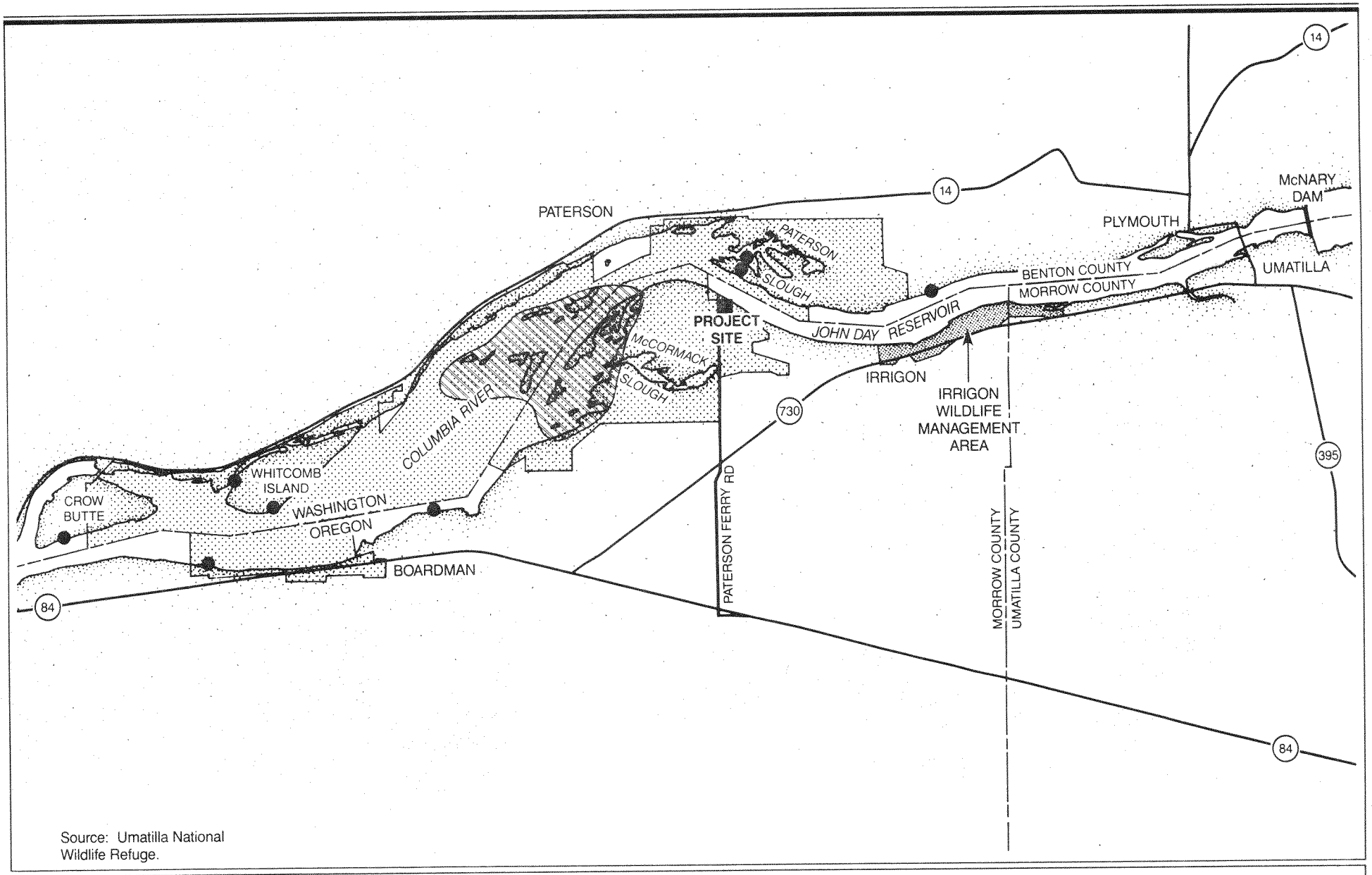
Site-specific studies of bald eagles in the project area are limited to annual midwinter surveys, conducted in early January by Umatilla Refuge personnel. Surveys from 1984 to 1986 showed an average of 69 bald eagles on the Refuge; the average during preceding years was about 20 birds. Two-thirds to three-fourths of the eagles were subadults (USFWS 1986; Annear, pers. comm. 1986). Greater eagle use of the Refuge in recent years may be part of a general increase in wintering populations in the Columbia Basin (Fielder, pers. comm. 1986), or a shift in distribution of the population from another area (Annear, pers. comm. 1986).

Over 80 percent of eagles counted on the Refuge during midwinter surveys were on or near islands, 2 to 7 miles downstream of the proposed hatchery (Figure B-2). These islands are primarily sand, with sagebrush and herb communities on some of the larger islands. Eagles apparently use these islands for daytime resting, and possibly for feeding (Annear, pers. comm. 1986; Passmore, pers. comm. 1986).

Eagles perch and roost in large trees (primarily black cottonwood) along both sides of the river (Annear, pers. comm. 1986). The roost site nearest to the project is at Paterson Slough, 3000 feet across the river (Figure B-2).

Bald eagle food habits have not been studied locally, but waterfowl is probably their major food. Midwinter waterfowl populations on the Refuge have averaged about 500,000 birds in recent years (Annear, pers. comm. 1986). The large percentage of subadult eagles suggests that food is readily available. Ducks and geese crippled or killed by hunters may provide an easy food source for these opportunistic feeders. Salmon carcasses are generally unavailable, due to elimination of runs on the Umatilla River (Boyce 1986). The present steelhead run is small (about 1800 fish), and spawns primarily in April and May, after eagles have left the area. Resident fishes such as bullhead and sucker may comprise a small percentage of the eagle diet, as suggested by a study on the mid-Columbia River (Fielder 1982).

Bald eagles are not known to nest in the project vicinity (Annear, pers. comm. 1986).



Source: Umatilla National Wildlife Refuge.

SCALE IN MILES

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Umatilla National Wildlife Refuge

● or

Eagle Use Area

Figure B-2
Bald eagle winter use areas in project vicinity.

Peregrine Falcon

From 1 to 3 peregrine falcons are known to occur in the project area during their spring and fall migrations (Annear, pers. comm. 1986). Local peregrine residence is brief, lasting only a few days in March, and again in late October or November (Henjum, pers. comm. 1986). Nesting locations of these birds are undetermined, but are likely to be in northwestern Canada or interior Alaska (Beebe 1974). There is no known nesting of peregrine falcons in northeastern Oregon (Henjum, pers. comm. 1986).

Peregrine falcons live almost entirely on other birds, which they capture and often kill during flight. They require large, unobstructed air space for successful hunting, and typically prey on highly mobile, flocking species, such as waterfowl, shorebirds, and doves (Beebe 1974). Waterfowl are the most likely prey in the project vicinity.

In some areas peregrines tolerate high levels of human development, as evidenced by wintering and breeding records in major cities (Herman and Thelander 1980). They prefer tall trees and snags for perching, but also use man-made structures such as cranes and pilings, as well as open fields and mudflats. Because of their local rarity and lack of study, little is known of the behavior and habitat uses of peregrine falcons in the project area.

Determination of Effects

Potential impacts of construction and operation of the proposed Umatilla Summer Steelhead Hatchery can be evaluated in terms of species, populations, and individuals of the two listed species.

Interference with breeding potential is the greatest threat to bald eagles and peregrine falcons at the species level (Herman and Thelander 1980). Since neither species nests in the project vicinity, there is no risk of disturbing or removing nest sites. Project impacts at the species level would therefore be nil.

At the population level, primary concern focuses on wintering and migrating populations of both species (Herman and Thelander 1980). The proposed hatchery is in an eagle wintering area, but is well-removed (2 to 7 miles) from the islands which serve as the primary eagle resting area. The nearest known eagle roost (Paterson Slough) is more than 3000 feet across the reservoir from the project site. There are no trees onsite, and the project will not alter eagle feeding, perching, or roosting habitats. Waterfowl (i.e., prey) habitats will not be altered either. Improvement of the summer steelhead run will provide little additional food to wintering eagles, as peak spawning occurs in April and May, after eagles have left the area. The project is therefore not expected to affect bald eagle populations.

A small population of peregrine falcons migrates through the project area briefly during spring and fall. Local behavior is unknown, but based on other work (Beebe 1974), they probably hunt waterfowl over islands, sloughs, and

fields on the Refuge. Local perches and roosts may be the same as for bald eagles (i.e., large cottonwoods). The project would not alter these types of habitats, and should have no effect on migrating populations of peregrine falcons.

Hatchery construction and operation would neither harm nor benefit individual bald eagles or peregrine falcons. Bald Eagle Management Guidelines for Oregon and Washington (USFWS 1981) recommends that buildings be constructed no closer than 1/4 mile to eagle roost sites and shorelines of feeding waters. The nearest known eagle roost is over 1/2 mile from the proposed hatchery. The entire reservoir is potential eagle feeding habitat, but daytime use appears to be concentrated on the islands several miles downstream of the project. The site is therefore far enough away from eagle use areas that construction activity should not bother the birds. Hatchery operation would involve low levels of human activity, and would have negligible effect on individual eagles.

Peregrine falcons reside in the project area for just a few days of the year. These highly mobile birds can easily avoid any activity associated with hatchery construction or operation during their brief stay.

In summary, the proposed Umatilla Summer Steelhead Hatchery will have no significant effect on bald eagles or peregrine falcons.

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APPENDIX C

USFWS LETTER OF CONCURRENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Portland Field Office
727 NE 24th Street
Portland, OR 97232

May 19, 1986

Ms. Rose Hayden
Department of Energy
Bonneville Power Administration
P. O. Box 3621
Portland, OR 97208

RE: 1-7-86-I-121

This is in response to your letter dated April 24, 1986, received by us on April 25, 1986, transmitting your biological assessment of the impacts on bald eagles and peregrine falcons from the proposed Umatilla Steelhead Hatchery project area in Morrow County, Oregon.

We have reviewed the assessment and concur with your finding of no effect to bald eagles and peregrine falcons. We also wish to commend you for presenting a very clearly written and thorough biological assessment.

The requirements established under Sections 7(a)(2) and 7(c) of the Endangered Species Act of 1973, as amended, have been meet, thereby concluding the consultation process.

We appreciate your concern for listed species.

Russell D. Peterson
Field Supervisor

cc:
RO (AFA-SE
PFO-ES
ODFW
ONHP

HAYDEN.DH.BO.GBWPES

APPENDIX D

USFWS CONSULTATION LETTER

ON UPSTREAM SITE AND EXPANSION ALTERNATIVE

PGC

NOV 2 6 1986

Ms. Diana Hwang
U.S. Fish and Wildlife Service
Portland Field Office
727 N.E. 24th Avenue
Portland, OR 97232

Dear Ms. Hwang:

As I explained to you by phone on November 24, I would like to reinitiate threatened and endangered species consultation with you on Bonneville Power Administration's (BPA) proposed Umatilla Fish Hatchery. As you will recall, I sent you a biological assessment (copy enclosed) in April of this year on our then current hatchery proposal and you responded with a May 19th letter concurring with the biological assessment's finding of no effect.

We are now changing our consideration for the hatchery to include: 1) another preferred site adjacent to and upstream from the originally proposed site (see enclosed map), and 2) possible future expansion of the hatchery to produce 120,000 pounds of spring and fall chinook salmon annually in addition to the originally planned 40,000 pounds of steelhead trout. We are naming our previously considered location the downstream site and our new location the upstream site.

I have attached to this letter a brief summary of the impacts expected to occur to the bald eagle and peregrine falcon at this new location and considering the additional fish production numbers. Please review this summary and respond with either your concurrence to our new finding of no effect or respond with comments regarding our finding. I would very much appreciate a quick turnaround since we would like to include results of this consultation in an enironmental assessment which we hope to finalize by December 10, 1986.

Sincerely,

Rose Hayden

Rose Hayden
Environmental Specialist
Office of Power and Resources Management

Enclosures
RHayden:roh:11-26-86 (PGC-4742K)

Impact Summary for the Bald Eagle and Peregrine Falcon

The upstream site is approximately 28 acres in size and is bounded on the west end by the downstream site, on the east end by the existing Irrigon Hatchery, on the north side by the Columbia River and on the south side by the Irrigon Hatchery Road. All of the habitat, vegetation, soil and shoreline characteristics which applied to the downstream site also applies to the upstream site. In our new expansion alternative, all of the facilities and layout will be basically the same. However, the facilities will be sized for four times the originally proposed production, e.g. there would be three additional sets of 5 rearing ponds, so the layout may take up 6-7 acres of the site versus 5-6 acres with no expansion. Hatchery operation will still generally involve low levels of human activity/disturbance to the bald eagle or peregrine falcon because: 1) the upstream site is closer to the existing Irrigon Hatchery with the intention of combining maintenance activities for both hatcheries, and 2) the upstream hatchery site is further away from the Umatilla National Wildlife Refuge and just as far from the Paterson Slough as the downstream site. Both the Umatilla Refuge and the Paterson Slough are nearby eagle and peregrine falcon use areas.

Potential impacts to the bald eagle and peregrine falcon from this new upstream site with possible expansion remains basically the same as the downstream site. Since neither species nests in the project vicinity, there is no risk of disturbing or removing nest sites. Project impacts at the species level would therefore be nil. At the population level, primary concern focuses on wintering and migrating populations of both species. The upstream site is still in an eagle wintering area, but is well-removed (2-7 miles) from the islands which serve as the primary eagle resting area (see figure b-2 in the enclosed biological assessment). The nearest known eagle roost (Paterson Slough) is more than 2800 feet (more than 1/2 mile) across the reservoir from the upstream site. There are no trees onsite, and the project will not alter eagle feeding, perching, or roosting habitats. Waterfowl (i.e. prey) habitats will not be altered either. Improvement of the summer steelhead and spring and fall chinook runs will provide little additional food to the wintering eagles since steelhead and spring chinook don't return in the winter months and it is expected that most of the fall chinook that would be returning in the winter months will be harvested. The project is therefore not expected to affect bald eagle populations.

A small population of peregrine falcons migrates through the project area briefly during spring and fall. Local behavior is unknown, but based on other work (Beebe 1974), they probably hunt waterfowl over islands, sloughs, and fields on the Umatilla National Wildlife Refuge. Local perches and roosts may be the same as for bald eagles (i.e., large cottonwoods). The project at the upstream site would not alter these types of habitats, and should have no effect on migrating populations of peregrine falcons.

Hatchery construction and operation at the upstream site would neither harm nor benefit individual bald eagles or peregrine falcons. Bald Eagle Management Guidelines for Oregon and Washington (USFWS 1981) recommends that buildings be constructed no closer than 1/4 mile to eagle roost sites and shorelines of feeding waters. The nearest known eagle roost is 2800 feet, or over 1/2 mile from the upstream site. The entire reservoir is potential eagle feeding habitat, but daytime use appears to be concentrated on the islands several miles downstream of the two proposed project sites. These sites therefore are far enough away from eagle use areas that construction activity should not bother the birds. Hatchery operation would involve low levels of human activity, and would have negligible effect on individual eagles.

Peregrine falcons reside in the upstream site area for just a few days of the year. These highly mobile birds can easily avoid any activity associated with hatchery construction or operation during their brief stay.

In summary, the proposed Umatilla Fish Hatchery upstream site with possible production expansion will have no significant effect on bald eagles or peregrine falcons.

APPENDIX E

USFWS LETTER OF CONCURRENCE

ON UPSTREAM SITE AND EXPANSION ALTERNATIVE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Portland Field Office
727 NE 24th Avenue
Portland, OR 97232

December 3, 1986

1-7-87-I-32

Rose Hayden
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208-3621

Dear Ms. Hayden:

This is in response to your November 26, 1986 letter that was received by us on November 28, 1986, requesting reinitiation of informal consultation on Bonneville Power Administration's proposed Umatilla Fish Hatchery in Morrow County, Oregon.

We have reviewed the summary of impacts provided with your November 26, 1986 letter and April Biological Assessment of the impacts on bald eagles and the peregrine falcon. Based upon your summary of impacts, the expansion and new upstream preferred site do not appear to be major modifications which would significantly alter anticipated impacts to bald eagle and peregrine falcon. We, therefore, concur with your finding of no effect to the bald eagle and peregrine falcon.

The requirements under Section 7(a)(2) and 7(c) of the Endangered Species Act of 1973, as amended, have been met, thereby concluding the consultation process.

We appreciate your concern for listed species.

Sincerely,

Russell D. Peterson

Russell D. Peterson
Field Supervisor

cc: FWE-SE
ODFW (Nongame)
ONHP
PFO-ES

CONCUR .DH.ZE.DDISK3:11/05/86

APPENDIX F

OREGON STATE HISTORIC PRESERVATION OFFICE

LETTER OF CONCURRENCE

VICTOR ATIYEH
GOVERNOR

Department of Transportation
STATE HISTORIC PRESERVATION OFFICE
Parks and Recreation Division
525 TRADE STREET S.E., SALEM, OREGON 97310

July 3, 1986

Rose Hayden
Bonneville Power Administration, PGC
P.O. Box 3621
Portland, OR 97208

Dear Ms. Hayden:

RE: Proposed Umatilla Fish Hatchery
Eastern Washington University Report #100-53
Morrow County

This letter is in response to the cultural resource survey carried out to assess impact of the above-mentioned project on historic and archeological sites.

After a careful review of the cultural resource survey carried out within the project area, our office can offer the following comments. We feel that no cultural resources of National Register potential have been identified which are likely to be impacted by this project. We therefore feel that Public Law 89-665 and Executive Order 11593 have been complied with and the project may go forward as planned.

Thank you for your cooperation and concern. If you have any questions, please call Leland Gilsen at 378-5001.

Sincerely,

D. W. Powers III
Deputy SHPO

DWP/LG:lr
0507D

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

2630

ENVIRONMENTAL ASSESSMENT FOR ANADROMOUS FISH HABITAT ENHANCEMENT ON THE UMATILLA NATIONAL FOREST PORTION OF THE UMATILLA RIVER DRAINAGE

May 1985

Responsible Agency

U.S.D.A. Forest Service
Umatilla National Forest
2517 S.W. Hailey
Pendleton, Oregon 97801

Responsible Official

John E. Lowe
Forest Supervisor

Cooperating Agency

Bonneville Power Admin.
P.O. Box 3621
Portland, Oregon 97208

For Further Information Contact

Ralph H. Perkins, District Ranger
Walla Walla Ranger District
1415 West Rose
Walla Walla, Washington 99362
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ABSTRACT: This assessment describes three (3) alternatives regarding the enhancement of anadromous fish habitat on land administered by the Forest Service within the proclaimed boundary of the Umatilla National Forest. Proposed actions involve construction of pool creating structures and rehabilitation of riparian vegetation. Anticipated effects implementing these alternatives, including no action, are addressed.

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FS-6200-7 (10/73)

DECISION NOTICE
and
FINDINGS OF NO SIGNIFICANT IMPACT

ANADROMOUS FISH HABITAT ENHANCEMENT
ON THE UMATILLA NATIONAL FOREST PORTION OF THE UMATILLA RIVER DRAINAGE

USDA - Forest Service
Umatilla National Forest

An environmental assessment discussing proposed enhancement of anadromous fish habitat on National Forest administered lands in the Umatilla River drainage is available for review at Forest Service offices in Pendleton, Oregon, and Walla Walla, Washington.

The proposed enhancement area is located on National Forest lands in Umatilla County, State of Oregon, approximately 25 miles east of Pendleton, Oregon. Most of stream reaches proposed for enhancement activity are within the following townships:

Township	1 S.,	Range	36 E.,	Willamette	Meridan
"	1 N.,	"	" " ,	"	"
"	2 " ,	"	" " ,	"	"
"	3 " ,	"	" " ,	"	"
"	2 " ,	"	37 " ,	"	"

Based on the analysis described in the Environmental Assessment for this proposed action, I have selected Alternative "C". Alternative "C" produces the best benefit:cost ratio (7.7:1) with only minimal short-term effects on the drainage's water quality. Long-term water quality for the drainage will be improved due to stabilization of existing cut-banks.

Based on the environmental analysis and assessment, I find that this is not a major Federal action that would significantly affect the quality of the human environment, therefore, an environmental impact statement is not required.

Implementation of this project may take place after 30 days of signature and date of this Decision Notice.

This decision is subject to administrataive review (appeal) pursuant to 36 CFR 211.19. A notice of appeal must be filed with the Forest Supervisor within 45 days of the date of this Decision Notice.

John E. Lowe

JOHN E. LOWE
Forest Supervisor
2517 S.W. Hailey Avenue
Pendleton, OR 97801

JUN 7 1985
Date

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FOR
ANADROMOUS FISH HABITAT ENHANCEMENT
ON THE UMATILLA NATIONAL FOREST PORTION OF THE UMATILLA RIVER DRAINAGE

Inter-disciplinary Team

Rod Johnson, Wildlife Biologist, Umatilla National Forest
John Andrews, Fisheries Biologist, Umatilla National Forest
Gary James, Fish Biologist, Confederated Tribes of the Umatilla Indian Reservation

Recommended:

Ralph H Palm
Walla Walla District Ranger — Date 5/17/85

Dave Rice
North Fork District Ranger — Date 5/23/85

ENVIRONMENTAL ASSESSMENT
FOR
ANADROMOUS FISH HABITAT ENHANCEMENT
ON THE UMATILLA NATIONAL FOREST PORTION OF THE UMATILLA RIVER DRAINAGE

I. INTRODUCTION

A. Proposed Action

Placement of in-channel pool creating structures, bank protection structures, replacement of stream shading vegetation, and repair/replacement of existing in-channel structures in those stream reaches within the proclaimed boundary of the Umatilla National Forest accessible to anadromous fish.

B. Purpose and Need

Over the next ten (10) calendar year period, enhance anadromous chinook salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*Salmo gairdneri*) habitat on that portion of non-Wilderness National Forest administered lands in the Umatilla River drainage.

Habitat capacity for anadromous steelhead trout and chinook salmon in the drainage is significantly limited by the lack of pool area to hold returning adult fish and rear juvenile fish.

C. Decision to be Documented

The type and number of structures that will best improve the anadromous fish habitat capability of the drainage, considering the expected costs and impacts on other resouce values.

D. Background Information

The analysis area is located primarily on the Walla Walla Ranger District, Umatilla National Forest. A small portion of the area is also located on the North Fork of the John Day Ranger District of the Umatilla National Forest. The entire area is within the Umatilla River drainage in Umatilla County, State of Oregon.

For the specific location of the analysis area refer to Figures 1 and 2 in the Appendix.

All stream reaches being considered in the proposed action, with the exception of Pearson Creek, are within the Umatilla National Forest's Elgin Planning Unit. The Pearson Creek reach is in the Forest's Desolation Planning Unit. Current resource management direction for the analysis area is presented in these approved management plans. (1,2)

Anadromous steelhead trout are currently present in approximately 78 miles of stream reach in the analysis area. (5) Approximately 58 miles of this are National Forest administered lands.(5)

In addition to the existing steelhead trout habitat, approximately 15 miles of potential habitat for anadromous chinook salmon exists within the analysis area. (4, 8) Approximately 7.0 miles of this potential habitat are on National Forest administered lands. (5)

For additional specifics refer to Appendix I and II.

The Northwest Power Planning Act requires the Bonneville Power Administration to mitigate losses of fish and wildlife habitat values resulting from construction and maintenance of hydro-electric dams on the Columbia River. (3) The Oregon Department of Fish and Wildlife (ODF&W) and Confederated Tribes of the Umatilla Indian Reservation (CTUIR) have proposed that a portion of this mitigation take the form of off-site enhancement of existing anadromous fish (steelhead) habitat in the Umatilla River drainage. (4)

The Confederated Tribes of the Umatilla Indian Reservation desire re-establishment of spring and/or fall chinook salmon runs in the Umatilla River. (4) It has been proposed that BPA mitigation funds also be used to enhance habitat for this species in the Umatilla River drainage. (4)

The optimum pool:riffle ratio for steelhead trout and chinook salmon is 50:50 and 60:40 respectively. (8) At the present time, the over-all pool:riffle ratio for those streams capable of supporting both steelhead trout and chinook salmon is approximately 10:90. (8) The pool:riffle ratio for those stream reaches capable of supporting only steelhead trout is approximately 12:88.(8)

The optimum level of stream surface shading is judged to be 80%. (8) While stream surface shading is generally more than this on most stream reaches in the analysis area, it is significantly less along the lower reach of the South Fork of the Umatilla River (below Thomas Creek) and the main stem reach of Meacham Creek. (4, 6, and 7). On the main stem reach of Meacham Creek, warm mid-summer water temperatures appear to be limiting survival of rearing steelhead.

To varying degrees, recreation angling for native trout takes place in all reaches within the drainage. This angling use is not judged to be detrimental to rearing anadromous fish species. (8)

The short period of time when in-stream operation of equipment can take place, without significant detrimental impacts to spawning and/or early rearing anadromous fish, may affect the availability of contractors, annual work accomplishment, and project administration.

The proposed action will be cooperativly funded by the Bonneville Power Administration (BPA) and USDA Forest Service (USFS). Project work will be accomplished under direction of the USFS.

E. Issues, Concerns, and Opportunities (ICO's)

The proposed activity will not have a significant effect on the following issues and/or concerns and they are therefore judged to be non-pivotal to the decision:

1. Prime Farmlands, Rangeland, and Forestland

   Proposed activities will not change land classification.

2. Wetlands

   Proposed activities will be within the intent of Executive Order 11990.

3. Floodplains

   Proposed activities will meet the intent of Executive Order 11988 regarding floodplains.

4. Threatened and/or Endangered Species

   There are no known Federal or State of Oregon classified Endangered, Threatened, and/or Sensitive plant or animal species present in the area. After pre-construction inventory, if any are identified, activities will be modified to comply with existing laws and regulations.

5. Visual Sensitivity

   All activities will meet the Umatilla Forest's Visual Management Plan and USDA Forest Service Handbook No. 462, Chapter 1.

6. Cultural Resource

There are few known cultural sites and/or "ticklers" on the Analysis Area (Appendix XX). Current and cumulative listings on the National Register of Historic Places have been consulted. No cultural resources listed, or eligible for the Register, fall within the limits of the proposed activity (cf FR Vols. 44-47). A special clause will be included in all contracts awarded to protect previously undetected cultural resources. Compliance with 36 CFR 800 will be documented.

7. Air Quality

All action alternatives will have only extremely minor, short term effects on air quality. There will be no long-term effects.

8. Water Quality

No action alternative will have a long-term effect on water quality. In-stream construction activity will have a significant short-term effect on water silt loading immediately below the site. All proposed project work in any action alternative will be designed to mitigate this effect (in-stream construction activity during low flow periods, etc.). Beyond the expected short-term effects, State of Oregon water quality standards will be met by all action alternatives.

9. Sport Angling Impact on Rearing Steelhead Trout Smolts

Rearing anadromous fish will not be of legal size during the trout season and the estimated loss to anglers is expected to be quite small.

10. Consumers, Civil Rights, Minority Groups, and Women

All Federal contracts contain standard non-discrimination requirements. Federal regulations also require the providing of an adequate share of advertised contracts to small business concerns.

The proposed activity will have a significant impact on the following concerns and they are therefore judged to be pivotal to the decision:

1. Benefits (adult spawners) derived from the enhanced anadromous fish habitat will not justify the costs.

2. Construction of the Proposed Bear Creek Dam (North Fork of of Meacham Creek) will submerge recently constructed steelhead trout habitat enhancement project work.

II. ALTERNATIVES

A. Alternatives Considered

1. No Action.

2. Enhancement of steelhead trout and chinook salmon habitat in all non-Wilderness suitable stream reaches.

3. Enhancement of steelhead trout and chinook salmon habitat in all non-Wilderness suitable stream reaches except those in the North Fork of Meacham Creek (above the proposed dam site).

B. Mitigation Measures, Management Requirements, and Monitoring

All action alternatives will meet the following criteria:

1. Locations where access with large mechanized equipment is very difficult will either be avoided or considered only for non-mechanized activity (i.e. hand labor with only small power equipment).

2. Existing habitat improvement structures will either be repaired to an effective condition or removed.

3. Riparian vegetation disturbed during project activity will be rehabilitated.

4. Structures will be located, designed, and installed with the primary objective(s) being to retain, enhance, or create anadromous fish spawning, rearing, and/or adult resting habitat.

5. Based on cost effectiveness and biotic potential, highest priority reaches will normally be treated first. Improvement/enhancement activity in some stream reaches may not take place if the benefit:cost ratio is less than 1:1. Specific actions and decisions will be coordinated with the Oregon Department of Fish and Wildlife and Confederated Tribes of the Umatilla Indian Reservation.

6. Each proposed construction site will be evaluated by District personnel, Forest Fisheries Biologist, and/or Forest Hydrologist during the design phase to determine what type of structure(s), if any, will be constructed.

7. In-channel activity will not occur outside of the July 1 through August 31 period in chinook/steelhead streams and July 1 through November 1 in steelhead only streams. (10)

8. Streams within the recently established North Fork Umatilla Wilderness will not be considered for enhancement project work.

9. Project monitoring will be accomplished as a coordinated effort between the Oregon Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, and USDA Forest Service. Fish population studies will be conducted by the Department and monitoring of habitat improvement structure effectiveness/condition by the Forest Service.

III. EFFECTS OF IMPLEMENTATION

A. Alternative 'A' (no action)

1. Direct Effects

As this is the 'no-action' alternative, there would be no direct effects of implementation on the issues, concerns and opportunities judged pivotal to a decision. Steelhead and re-introduced chinook salmon runs would be permitted to develop to the capacity of the available habitat. Existing bank erosion would continue at a natural rate.

2. Indirect Effects

The indirect effect(s) of this 'no-action' alternative is that future steelhead and chinook salmon runs will be smaller than they could be if habitat was enhanced.

3. Cumulative Effects

None.

B. Alternative 'B' (enhancement of all non-Wilderness anadromous streams)

1. Direct Effects

The estimated benefit:cost ratio for full enhancement, without construction of the proposed Bear Creek Dam in the North Fork of Meacham Creek, would be 6.7 : 1. There would be intermittent short-term increases in in-stream siltation (due to construction activity at low flow periods), but annual spring high flows would "flush" the silt from the system. Long-term siltation would be decreased due to repair of existing streambank cutting.

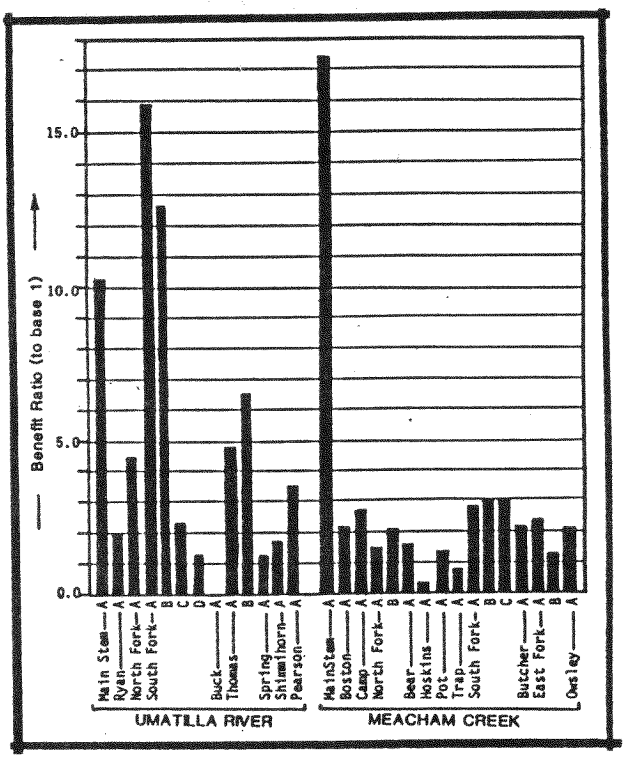
If the dam was constructed, and steelhead trout access to the enhanced habitat above the site lost, the benefit:cost ratio would decline to 6.5 : 1. With the dam in place, the drainage above the site would be lost to anadromous fish production.

2. Indirect Effects

Native fish populations (rainbow trout, Dolly Vardon char, etc.) would benefit significantly from the enhancement of anadromous fish habitat values.

3. Cumulative Effects

As habitat enhancement work takes place through the ten (10) year period, the population of anadromous fish (and native trout/char) would increase. The effect(s) of minor short-term siltation, resulting from in-channel construction activity, will be eliminated by annual spring 'flushing'. The long-term siltation level in the streams would decline somewhat due to repair of existing streambank cutting.



Benefit ratio (to base 1) of individual stream reaches in the Analysis Area (refer to XIX for addition details.

C. Alternative 'C' (enhancement of all non-Wilderness anadromous fish streams except the North Fork of Meacham Creek)

1. Direct Effects

The estimated benefit:cost ratio for enhancement would be 7.7 : 1. The ratio is higher than for Alternative "B" (with the dam) because: (1) Enhancement work will not be done above the dam and then fish access blocked by the dam; and (2) several of the streams in the area above the dam have a benefit:cost ratio of less than 1:1.

2. Indirect Effects

Native trout would also benefit from the enhancement of anadromous fish habitat, but to a lesser degree than for Alternative "B" - without construction of the dam.

3. Cumulative Effects

Essentially the same as Alternative "B" (with the dam).

IV. LIST OF REFERENCES USED

The following individuals and/or groups were consulted during the course of this analysis process:

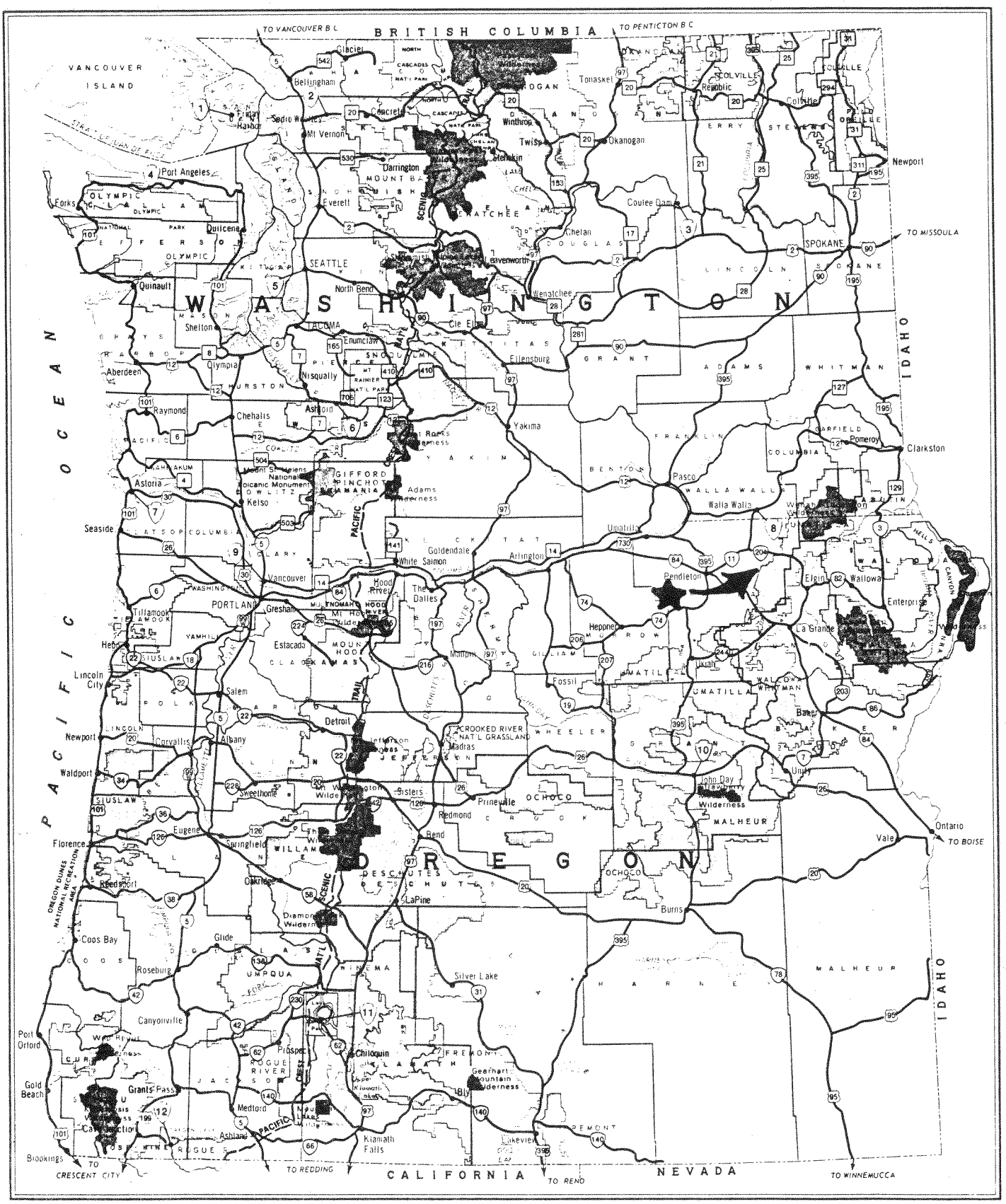
1. Dale Wondercheck, former Resource Assistant, North Fork John Day Ranger District, Umatilla National Forest, Ukiah, Oregon.

2. Jim Phelps, Fish Biologist, Oregon Department of Fish and Wildlife, Pendleton, Oregon.

3. Antone Minthorn, Chairman of the General Council, Confederated Tribes of the Umatilla Indian Reservation, Mission, Oregon.

APPENDIX

FIGURE 1



NATIONAL FOREST

NATIONAL FOREST WILDERNESS

MOUNT ST HELENS NATIONAL VOLCANIC MONUMENT

NATIONAL PARK

NATIONAL PARK SERVICE HEADQUARTERS

Scale in Miles

NATIONAL FORESTS and NATIONAL PARKS of PACIFIC NORTHWEST

U.S. HIGHWAY

INTERSTATE HIGHWAY

OREGON STATE HIGHWAY

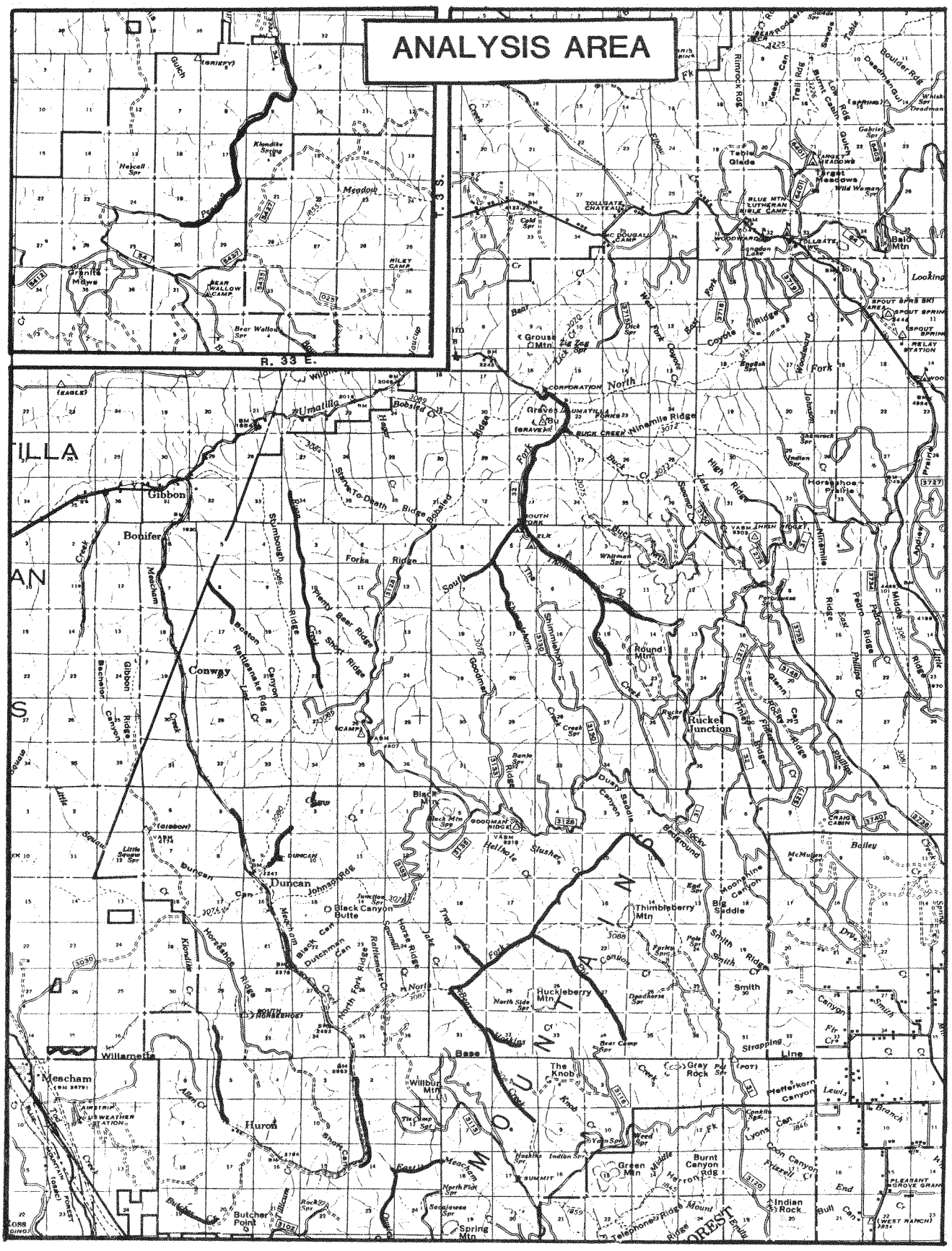
WASHINGTON STATE HIGHWAY

COUNTY LINE

PACIFIC CREST NATIONAL SCENIC TRAIL

DEPARTMENT OF AGRICULTURE, FOREST SERVICE – 1984

FIGURE 2


ANALYSIS AREA
R. 33 E.
R. 36 E.
R.37 E.
T. 3 N.
T.2 N.
T. 1 N.
Gibbon
Bonifer
Conway
Duncan
Meacham
Huron
Umatilla
Rucker Junction
Black Mtn
Round Mtn
Thimbleberry Mtn
Huckleberry Mtn
Big Saddle
Horseshoe Prairie
Indian Rock
Butcher Point
Willburn Mtn
The Knob
Green Mtn
Burnt Canyon Rdg
Spring Mtn
Black Canyon Butte
Grouse Mtn
Graves Mtn
Tabler Glade
Target Meadows
Bald Mtn
Meadow
Bailey
Smith
Strapping
Line
Base
Willamette
Bobsled Ridge
Short Ridge
Short Cut
Duncan Can
Horseshoe Ridge
Buck Cr
Coyote Ridge
Hilgemile Ridge
High Ridge
Rattlesnake Rdg
Boston Canyon
Sturmbough
Meacham Cr
Little Sevens
Bacheler Canyon
Gibbon Ridge
Klondike Cr
Dutchman Can
Black Can
North Fork Ridge
Rattlesnake Cr
Horse Ridge
Sawmill Cr
Jake Cr
Trap Cr
Hellhole Cr
Slusher Cr
Goodman Cr
Shimlahorn Cr
Duff Canyon
Saddle Cr
Bluefound
Becky
Moonshine Canyon
Smith Ridge
Smith Cr
Dry Cr
Fir Cr
Lewis Branch
Lyons Can
Coon Canyon
Prizzell Cr
Bull Can
Pleasant Grove Grain
Telephone Ridge
Mount End
Herron Cr
Middle Fk
Yam Spr
Weed Spr
Indian Spr
Haskins Spr
Sequoia Spr
Rock Spr
Bear Wallow Spr
Bear Wallow Camp
Riley Camp
Granite Mows
Nescall Spr
Khendike Spring
Gabriel Spr
Wild Woman Spr
Spout Springs Ski Area
Relay Station
Coffee Spr
Bobsled Cr
Stream To Death Ridge
Short Ridge
Spring Bear Ridge
Forks Ridge
South Fork
North Fork
Buck Creek
Corporation
Umatilla Forks
Ziz Zag Spr
Whitman Spr
Indian Spr
Ashcraft Spr
Horseshoe Prairie
Pauro Ridge
East Pauro Ridge
Middle Pauro
Phillips Cr
Rocky Can
Finley Ridge
Collins Ridge
Craig Cabin
Banjo Spr
Black Mtn Spr
Boothman Ridge
Duncan Johnson Rdg
Junction Spr
Pole Spr
Farkus Spr
Deadhorse Spr
North Side Spr
Bear Camp Spr
Grey Rock
Metlerkorn Canyon
Canyon Cr
Summit
Spring Mtn
Butcher Point
Meacham
Huron
Willamette
Duncan
Conway
Gibbon
Bonifer
Umatilla
Rucker Junction
Black Mtn
Round Mtn
Thimbleberry Mtn
Huckleberry Mtn
Big Saddle
Horseshoe Prairie
Indian Rock
Butcher Point
Willburn Mtn
The Knob
Green Mtn
Burnt Canyon Rdg
Spring Mtn
Black Canyon Butte
Grouse Mtn
Graves Mtn
Tabler Glade
Target Meadows
Bald Mtn
Meadow
Bailey
Smith
Strapping
Line
Base
Willamette

APPENDIX I

UMATILLA RIVER DRAINAGE ANADROMOUS FISH HABITAT OWNERSHIP
WITHIN THE UMATILLA NATIONAL FOREST BOUNDARY
(all figures represent miles)

		PRIVATE LAND			NATIONAL FOREST			TOTAL		
DRAINAGE	Stream	CH/ST	ST	Total	CH/ST	ST	Total	CH/ST	ST	Total
UMATILLA	Main Stem	0.9		0.9	0.6		0.6	1.5		1.5
	Ryan		0.9	0.9		4.6	4.6		5.5	5.5
	North Fork				1.1	5.1	6.2	1.1	5.1	6.2
	Coyote					0.5	0.5		0.5	0.5
	Johnson					0.5	0.5		0.5	0.5
	Woodward					0.4	0.4		0.4	0.4
	South Fork				3.5	2.2	5.7	3.5	2.2	5.7
	Buck					1.5	1.5		1.5	1.5
	Thomas					4.0	4.0		4.0	4.0
	Spring					0.7	0.7		0.7	0.7
	Shimmie-horn					1.1	1.1		1.1	1.1
	Pearson					4.8	4.8		4.8	4.8
	Sub-totals	0.9	0.9	1.8	5.2	25.4	30.6	6.1	26.3	32.4
MEACHAM	main stem	7.0		7.0	1.8		1.8	8.8		8.8
	Boston					1.1	1.1		1.1	1.1
	Camp		0.4	0.4		1.6	1.6		2.0	2.0
	North Fork		3.2	3.2		6.3	6.3		9.5	9.5
	Bear					3.5	3.5		3.5	3.5
	Hoskins					0.2	0.2		0.2	0.2
	Pot					3.0	3.0		3.0	3.0
	Trap					1.0	1.0		1.0	1.0
	South Fork		5.0	5.0		5.7	5.7		10.7	10.7
	Butcher		2.3	2.3		0.8	0.8		3.1	3.1
	East Fork		0.4	0.4		0.8	0.8		1.2	1.2
	Owsley					1.1	1.1		1.1	1.1
	Sub-totals	7.0	11.3	18.3	1.8	25.1	26.9	8.8	36.4	45.2
GRAND TOTALS		7.9	12.2	20.1	7.0	50.5	57.5	14.9	62.6	77.6

APPENDIX II

DESIGNATION OF NATIONAL FOREST ANADROMOUS FISH STREAMS
WHERE ENHANCEMENT ACTIVITY IS PROPOSED
(all figures represent miles)

		Total On-Forest Forest Anadromous Streams (Appendix I)			North Fork Umatilla Wilderness			Stream Reaches Proposed for Enhancement Activity: ALTERNATIVE B			ALTERNATIVE C		
Drainage	Stream	CH/ST	ST	Total	CH/ST	ST	Total	CH/St	ST	Total	CH/ST	ST	Total
UMATILLA	Main Stem	0.6		0.6				0.6		0.6	0.6		0.6
	Ryan		4.6	4.6					4.6	4.6		4.6	4.6
	North Fork	1.1	5.1	6.2	1.0	5.1	6.1	0.1		0.1	0.1		0.1
	Coyote		0.5	0.5		0.5	0.5						
	Johnson		0.5	0.5		0.5	0.5						
	Woodward		0.4	0.4		0.4	0.4						
	South Fork	3.5	2.2	5.7				3.5	2.2	5.7	3.5	2.2	5.7
	Buck		1.5	1.5		1.4	1.4		0.1	0.1		0.1	0.1
	Thomas		4.0	4.0					4.0	4.0		4.0	4.0
	Spring		1.5	1.5					1.5	1.5		1.5	1.5
	Shimmiehorn		1.1	1.1					1.1	1.1		1.1	1.1
	Pearson		4.8	4.8					4.8	4.8		4.8	4.8
	Sub-totals	5.2	25.4	30.6	1.0	7.9	8.9	4.2	17.5	21.7	4.2	17.5	21.7
MEACHAM	main stem	1.8		1.8				1.8		1.8	1.8		1.8
	Boston		1.1	1.1					1.1	1.1		1.1	1.1
	Camp		1.6	1.6					1.6	1.6		1.6	1.6
	North Fork		6.3	6.3					6.3	6.3			
	Bear		3.5	3.5					3.5	3.5			
	Hoskins		0.2	0.2					0.2	0.2			
	Pot		3.0	3.0					3.0	3.0			
	Trap		1.0	1.0					1.0	1.0			
	South Fork		5.7	5.7					5.7	5.7		5.7	5.7
	Butcher		0.8	0.8					0.8	0.8		0.8	0.8
	East Fork		0.8	0.8					0.8	0.8		0.8	0.8
	Owsley		1.1	1.1					1.1	1.1		1.1	1.1
	Sub-totals	1.8	25.1	26.9	0	0	0	1.8	25.1	26.9	1.8	11.1	12.9
GRAND TOTALS		7.0	50.5	57.5	1.0	7.9	8.9	6.0	42.6	48.6	6.0	28.5	34.6

APPENDIX III

PROPOSED ENHANCEMENT STREAM REACH DESCRIPTIONS

Drainage	Stream	Reach	Length (mi)	Fish Species Present	Reach Description
UMATILLA	Main Stem	A	0.6	CH/ST	Private land boundary to North Fork junction.
	Ryan Cr.	A	4.6	ST	Private land boundary to end of steelhead
	North Fork	A	0.1	CH/ST	Mouth to Wilderness boundary of steelhead.
	South Fork	A	0.6	CH/ST	Mouth to junction with Buck Creek.
		B	2.9	CH/ST	Mouth of Buck Creek to mouth of Thomas Creek.
		C	1.3	ST	Mouth of Thomas Creek to the mouth of Shimmiehorn Creek.
		D	0.9	ST	Mouth of Shimmiehorn Creek to end of steelhead.
	Buck	A	0.1	ST	Mouth to Wilderness boundary
	Thomas	A	2.5	ST	Mouth to junction with Spring Creek.
		B	1.5	ST	Junction with Spring Creek to end steelhead.
	Spring	A	1.5	ST	Mouth to end steelhead
	Shimmiehorn	A	1.1	ST	Mouth to end of steelhead
	Pearson	A	4.8	ST	Forest boundary to end of steelhead distribution.
Sub-totals			21.7		
MEACHAM	Main Stem	A	1.8	CH/ST	Forest land between Forest boundary and mouth of the North Fork.
	Boston	A	1.1	ST	Mouth to end of steelhead
	Camp	A	1.6	ST	Mouth to end of steelhead
	North Fork	A	1.8	ST	Junction with Bear Creek to Junction with Pot Creek.
		B	4.5	ST	Junction with Pot Creek to to end of steelhead.
	Bear Creek	A	3.5	ST	Mouth to end of steelhead
	Hoskins Creek	A	0.2	ST	Mouth to end of steelhead
	Pot Creek	A	3.0	ST	Mouth to end of steelhead
	Trap Creek	A	1.0	ST	Mouth to end of steelhead
	South Fork	A	1.8	ST	Junction with North Fork to private land boundary.
		B	2.6	ST	Remainder of channel to Forest boundary
		C	1.3	ST	Isolated National Forest section.
	Butcher	A	0.8	ST	Private land boundary to end of steelhead.
	East Fork	A	0.1	ST	Private land boundary to junction with Owsley Creek.
		B	0.7	ST	Junction with Owsley Creek to end of steelhead
	Owsley	A	1.1	ST	Mouth to end of steelhead
Sub-total			26.9		
GRAND TOTAL			48.6		

APPENDIX IV

EXISTING/ENHANCED POOL HABITAT LEVELS IN ENHANCED ANADROMOUS FISH STREAMS

DRAINAGE	Stream	Reach	Length Mi.	Length Ft.	Ave. Width	Surface Area	Fish Species Present	Enhanced Objective P/R Ratio	Enhanced Pool Area	Existing Pool Area	Pool Area Reqd. To Reach the Enhanced Level
UMATILLA	* Main Stem	A	0.6	3,200	15	48,000	CH/ST	60:40	28,800	3,700	25,100
	* Ryan	A	4.6	24,290	8	194,300	ST	50:50	97,150	9,700	87,450
	* North Fork	A	0.1	530	20	10,560	CH/ST	60:40	6,340	1,060	5,280
	‡ South Fork	A	0.6	3,200	15	48,000	CH/ST	50:50	24,000	3,700	20,300
	‡	B	2.9	15,200	14	212,800	CH/ST	50:50	106,400	27,200	79,200
	‡	C	1.3	6,600	12	79,200	ST	30:70	23,760	14,000	9,760
	‡	D	0.9	5,100	7	35,700	ST	20:80	7,140	3,800	3,340
	* Buck	A	0.1	530	4	2,120	ST	50:50	1,060	1,060	0
	‡ Thomas	A	2.5	21,100	4	84,400	ST	50:50	42,200	8,400	33,800
	*	B	1.5	7,920	3	23,760	ST	50:50	11,880	1,200	10,680
	‡ Spring	A	0.7	3,450	5	17,250	ST	50:50	8,620	5,280	3,345
	‡ Shimmihorn	A	1.1	6,750	6	40,500	ST	20:80	8,100	5,000	3,100
	* Pearson	A	4.8	23,340	6	152,000	ST	50:50	76,000	15,200	60,800
	Sub-totals	N/A	21.7	121,210	N/A	948,590	N/A	N/A	441,450	99,300	342,155
MEACHAM	* Main Stem	A	1.8	9,500	20	190,000	CH/ST	50:50	95,000	9,500	85,500
	* Boston	A	1.1	5,800	5	29,000	ST	20:80	5,800	1,160	4,640
	* Camp	A	1.6	8,440	7	59,140	ST	50:50	29,570	20,690	8,880
	* North Fork	A	1.8	9,500	10	95,000	ST	50:50	47,500	16,630	30,870
	*	B	4.5	23,760	5	118,880	ST	20:80	23,760	14,260	9,500
	* Bear	A	3.5	18,480	4	73,920	ST	20:80	14,780	11,100	3,680
	* Hoskins	A	0.2	1,060	3	3,170	ST	50:50	1,580	200	1,580
	* Pot	A	3.0	15,840	6	95,040	ST	20:80	19,000	9,500	9,500
	* Trap	A	1.0	5,280	3	15,840	ST	50:50	7,920	1,110	6,810
	‡ South Fork	A	1.8	9,510	10	95,100	ST	50:50	47,550	28,530	19,020
	*	B	2.6	13,730	9	123,570	ST	50:50	61,790	3,090	58,700
	*	C	1.3	6,860	7	48,020	ST	50:50	24,010	2,400	21,610
	* Butcher	A	0.8	4,250	4	17,000	ST	20:80	3,400	1,460	1,940
	‡ East Fork	A	0.1	530	8	4,240	ST	50:50	2,120	320	1,800
	‡	B	0.7	3,670	6	22,020	ST	20:80	4,400	990	3,410
	+ Owsley	A	1.1	5,800	5	29,000	ST	30:70	8,700	4,360	4,340
	Sub-totals	N/A	26.9	142,010	N/A	1,018,940	N/A	N/A	396,880	125,300	221,780
GRAND TOTALS		N/A	48.6	263,220	N/A	1,967,530	N/A	43:57	838,330	224,600	613,935

1/ - * indicates Oregon Department of Fish and Wildlife stream survey data (1960s)

‡ indicates recent U.S. Forest Service stream survey data (1984)

+ indicates a combination of the two sources of stream survey data.

APPENDIX V

PLACED BOULDER/STRUCTURE POOL SIZE ASSUMPTIONS
(all figures from source citation #8)

The following assumptions were used to estimate the size of a pool created by placement of boulders (defined as a solid rock 3 feet or greater in size) and other structures:

A. A boulder placed in the various streams within the analysis area creates the following average sized pool:

Umatilla River (main stem).	40 square feet of surface area.
South Fork of the Umatilla River (Reach B) . .	" " " " " "
Meacham Creek (main stem)	" " " " " "
Thomas Creek (Reach A)	30 square feet of surface area
Pearson Creek	" " " " " "
South Fork of Meacham Creek (Reach A)	" " " " " "
All other streams and reaches	20 square feet of surface area

B. A large sized structure creates a 1600 square foot pool.

C. A medium sized structure creates a 410 square foot pool.

D. A small sized structure creates a 80 square foot pool.

E. Large, medium, and small sized structures will be placed only where access for large motorized equipment is possible. Only small sized structures will be placed where access for large motorized equipment is either not possible or exceedingly difficult.

APPENDIX VI

STRUCTURES/BOULDERS PROPOSED TO REACH ENHANCEMENT POOL HABITAT OBJECTIVE

			TYPE PHYSICAL IMPROVEMENT											
			Large Structure		Medium Structure		Small Structure		Boulder					
Drainage	Stream	Reach	No.	Square Feet Created Pool (Appendix V)	No.	Square Feet Created Pool (Appendix V)	No.	Square Feet Created Pool (Appendix V)	No.	Square Feet Created Pool (Appendix V)	ENHANCED POOL HABITAT ACCOMPLISHED	PERCENT ENHANCED POOL HABITAT OBJECTIVE 1/	
UMATILLA	Main Stem	A	1	1,600	36	14,760	12	960	180	7,200	24,520	97.3	
	Ryan	A	0	0	46	18,860	46	3,860	460	9,200	31,920	36.3	2/
	North Fork	A	1	1,600	0	0	3	240	50	1,500	3,340	63.3	3/
	South Fork	A	1	1,600	8	3,280	18	1,440	300	12,000	18,320	90.2	
		B	4	6,400	75	30,750	87	6,960	870	34,800	78,910	99.6	
		C	0	0	0	0	26	2,080	130	2,600	4,680	48.0	2/
		D	0	0	0	0	5	400	20	400	1,620	48.5	2/
	Buck	A	0	0	0	0	0	0	0	0	0	100.0	
	Thomas	A	0	0	25	10,250	100	8,000	375	11,250	29,500	87.3	4/
		B	0	0	0	0	60	4,800	150	3,000	7,800	73.0	4/
	Spring	A	0	0	0	0	14	1,120	70	1,400	2,520	75.3	2/
	Shimmihorn	A	0	0	0	0	11	880	0	0	880	28.4	2/
	Pearson	A	0	0	50	20,500	144	11,520	960	28,800	60,820	100.0	
	Sub-totals	N/A	7	11,200	240	99,220	526	47,080	3,565	112,150	264,830	77.0	
MEACHAM	Main Stem	A	3	4,800	80	32,800	60	4,800	900	36,000	78,400	91.7	
	Boston	A	0	0	0	0	22	1,760	10	2,200	3,960	85.3	6/
	Camp	A	0	0	0	0	32	2,560	160	3,200	5,760	64.9	6/
	North Fork	A	0	0	20	8,200	30	2,400	300	6,000	16,600	53.8	6/
		B	0	0	0	0	10	800	400	8,000	8,800	92.6	6/
	Bear	A	0	0	0	0	10	800	60	1,200	2,000	54.3	6/
	Hoskins	A	0	0	0	0	5	400	10	200	600	38.0	6/
	Pot	A	0	0	0	0	30	2,400	50	1,000	3,400	35.8	6/
	Trap	A	0	0	0	0	20	1,600	20	400	2,000	29.4	6/
	South Fork	A	0	0	10	4,100	54	4,320	354	10,620	19,040	100.0	
		B	0	0	75	30,750	100	8,000	1000	20,000	58,750	100.0	
		C	0	0	22	9,020	22	1,760	220	4,400	15,180	70.0	2/
	Butcher	A	0	0	0	0	16	1,280	80	1,600	2,880	79.1	6/
	East Fork	A	0	0	0	0	10	800	20	400	1,200	66.7	6/
		B	0	0	0	0	14	1,120	0	0	1,120	32.8	6/
	Owsley	A	0	0	0	0	22	1,760	130	2,600	4,360	100.0	
	Sub-totals	N/A	3	4,800	207	84,870	455	36,560	3,714	97,820	223,450	71.4	
GRAND TOTALS		N/A	10	16,000	447	184,090	981	83,640	7,279	209,970	488,280	80.0	

1/ As shown in Appendix IV.
2/ Physical access to channel restricted along significant portion of the reach.
3/ Physical access and visual problems along a significant portion of the reach.
4/ Lack of suitable sites and visual problems along significant portion of the reach.
5/ Physical access difficult, lack of suitable sites, and/or visual problems along a significant portion of the reach.
6/ Physical access difficult and lack of suitable sites along a significant portion of the reach.

APPENDIX VII

METHOD USED TO ESTIMATE THE NUMBER OF SMOLTS AND SPAWNERS
FOR THE ENHANCED HABITAT SITUATION 1/

This process makes the following assumptions:

1. A chinook salmon spawner will produce 160 viable smolt (w/smolt to adult rate of 1.25%).
2. A steelhead trout spawner will produce 150 viable smolt (w/smolt to adult rate of 1.33%).
3. A SMALL PLACED BOULDER (20 sq. ft. pool) will produce rearing habitat for 15 salmon and 3 steelhead smolt, or 5 steelhead smolt if in a steelhead only stream.
4. A MEDIUM PLACED BOULDER (30 sq. ft. pool) will produce rearing habitat for 25 salmon and 5 steelhead smolt, or 8 steelhead smolt if in a steelhead only stream.
5. A LARGE PLACED BOULDER (40 sq. ft. pool) will produc rearing habitat for 35 salmon and 8 steelhead smolt, or 12 steelhead smolt if in a steelhead only stream.
6. A SMALL STRUCTURE (80 sq. ft. pool) will produce rearing habitat for 50 salmon and 12 steelhead smolt, or 20 steelhead smolt if in a steelhead only stream.
7. A MEDIUM STRUCTURE (410 sq. ft. pool) will produce rearing habitat for 75 salmon and 25 steelhead smolt, or 45 steelhead smolt if in a steelhead only stream.
8. A LARGE STRUCTURE (1,600 sq. ft. pool) will produce rearing habitat for 200 salmon and 60 steelhead smolt.
9. Downstream passage problems (Columbia and Umatilla River dams, etc.) are solved and habitat is fully seeded with spawning adult fish.

Process

Existing fish numbers for the respective streams were provided by Forest Service (FS) and Oregon Department of Fish and Wildlife (ODF&W) Fisheries Biologists.

Enhancement smolt increases were estimated in the following manner:

1. Multiply the estimated number of boulders (by size class) to be placed in a stream reach (Appendix VI) by the number of smolts (for CH and ST) produced for each size class placed boulder (as shown above).

2. Multiply the estimated number of structures (by size class) to be placed in a stream reach (Appendix VI) by the number of smolts (for CH and ST) produced for each size class structure (as shown above).

3. Sum the figures resulting from Steps 1 and 2 (for Ch and ST) to obtain the estimated number of smolts resulting from habitat enhancement.

The number of adult spawners for each species it will take to produce this number of smolts is determined by dividing the number of smolt for the species by the estimated number of smolts a spawner will produce (160 for CH and 150 for ST).

1/ - Specifics from source reference #8.

APPENDIX VIII

SMOLT PRODUCTION RESULTING FROM HABITAT ENHANCEMENT

DRAINAGE	Stream	Reach	Large Structure No. 1/	Large Structure Smolt Production 2/ CH	Large Structure Smolt Production 2/ ST	Medium Structure No. 1/	Medium Structure Smolt Production 2/ CH	Medium Structure Smolt Production 2/ ST	Small Structure No. 1/	Small Structure Smolt Production 2/ CH	Small Structure Smolt Production 2/ ST	Placed Boulder No. 1/	Placed Boulder Smolt Production 2/ CH	Placed Boulder Smolt Production 2/ ST	TOTAL ENHANCED SMOLT PRODUCTION CH	TOTAL ENHANCED SMOLT PRODUCTION ST
UMATILLA	Main Stem	A	1	200	60	36	2,700	900	12	144	240	180	6,300	1,440	9,344	2,640
	Ryan	A	0	0	0	46	0	2,070	46	0	2,070	460	0	2,300	0	6,440
	North Fork	A	1	200	60	0	0	0	3	150	36	50	125	25	475	121
	South Fork	A	1	200	60	8	600	200	18	900	216	300	10,500	2,400	12,200	2,876
		B	4	800	240	75	5,625	1,875	87	4,350	1,044	870	30,450	6,960	41,225	10,119
		C	0	0		0	0	0	26	0	520	130	0	650	0	1,170
		D	0	0		0	0	0	5	0	100	20	0	100	0	200
	Buck	A	0	0		0	0	0	0	0	0	0	0	0	0	0
	Thomas	A	0	0		25	0	1,125	100	0	2,000	375	0	3,000	0	6,125
		B	0	0		0	0	0	60	0	1,200	150	0	750	0	1,950
	Spring	A	0	0		0	0	0	14	0	280	70	0	140	0	420
	Shimmiehorn	A	0	0		0	0	0	11	0	220	0	0	0	0	220
	Pearson		0	0		50	0	2,250	144	0	2,880	960	0	7,680	0	12,810
	Sub-totals	N/A	7	1,400	420	240	8,925	8,420	526	5,544	10,806	3565	47,375	25,445	63,244	45,091
MEACHAM	Main Stem	A	3	600	180	80	6,000	2,000	60	3,000	720	900	31,500	7,200	41,100	10,100
	Boston	A	0	0	0	0	0	0	22	0	440	10	0	200	0	640
	Camp	A	0	0	0	0	0	0	32	0	640	160	0	800	0	1,440
	North Fork	A	0	0	0	20	0	900	30	0	600	300	0	1,500	0	2,700
		B	0	0	0	0	0	0	10	0	200	400	0	2,000	0	2,200
	Bear	A	0	0	0	0	0	0	10	0	200	60	0	300	0	500
	Hoskins	A	0	0	0	0	0	0	5	0	100	10	0	50	0	50
	Pot	A	0	0	0	0	0	0	30	0	600	50	0	250	0	250
	Trap	A	0	0	0	0	0	0	20	0	400	20	0	100	0	500
	South Fork	A	0	0	0	10	0	450	54	0	1,080	354	0	1,770	0	3,300
		B	0	0	0	75	0	3,375	100	0	2,000	1000	0	5,000	0	10,375
		C	0	0	0	22	0	990	22	0	440	220	0	1,100	0	2,530
	Butcher	A	0	0	0	0	0	1	16	0	320	80	0	450	0	770
	East Fork	A	0	0	0	0	0	1	10	0	200	20	0	100	0	300
		B	0	0	0	0	0	1	12	0	240	0	0	0	0	240
	Owsley	A	0	0	0	0	0	1	22	0	440	130	0	650	0	1,090
	Sub-totals	N/A	3	600	180	207	6,000	7,715	455	3,000	8,620	3714	31,500	21,470	41,100	36,985
GRAND TOTALS		N/A	10	2,000	600	447	14,925	16,135	981	8,544	19,426	7279	78,875	46,915	104,344	82,076

1/ - Numbers obtained from Appendix VI.
2/ - Numbers obtained from assumptions and process in Appendix VI.

ADULT SPAWNER PRODUCTION RESULTING FROM HABITAT ENHANCEMENT

DRAINAGE	Stream	Reach	SMOLTS 1/ CH	SMOLTS 1/ ST	ADULT SPAWNERS 2/ CH	ADULT SPAWNERS 2/ ST
UMATILLA	Main Stem	A	9,344	2,640	58.4	17.6
	Ryan	A	0	6,440	0.0	42.9
	North Fork	A	475	121	3.0	0.8
	South Fork	A	12,220	2,875	76.4	19.2
		B	41,225	10,119	257.8	67.5
		C	0	1,170	0.0	7.8
		D	0	200	0.0	1.3
	Buck	A	0	0	0.0	0.0
	Thomas	A	0	6,125	0.0	40.8
		B	0	1,950	0.0	13.0
	Spring	A	0	420	0.0	2.8
	Shimmihorn	A	0	220	0.0	1.5
	Pearson	A	0	12,810	0.0	85.4
	SUB-TOTALS	n/a	63,244	45,091	395.6	300.6
MEACHAM	Main Stem	A	41,000	10,100	256.9	67.3
	Boston	A	0	640	0.0	4.3
	Camp	A	0	1,440	0.0	9.6
	North Fork	A	0	2,700	0.0	18.0
		B	0	2,200	0.0	14.7
	Bear	A	0	500	0.0	3.3
	Hoskins	A	0	50	0.0	0.3
	Pot	A	0	250	0.0	1.7
	Trap	A	0	500	0.0	3.3
	South Fork	A	0	3,300	0.0	22.0
		B	0	10,375	0.0	69.2
		C	0	2,530	0.0	16.9
	Butcher	A	0	770	0.0	5.1
	East Fork	A	0	300	0.0	2.0
		B	0	240	0.0	1.6
	Owsley	A	0	1,090	0.0	7.3
	Sub-totals	n/a	41,000	36,985	256.9	249.6
GRAND TOTALS			104,344	82,076	652.5	547.2

1/ - Figures taken from Appendix VIII (Total Enhanced Smolt Production).
2/ - Derived using smolts/spawning adult figures of 160 for CH and 150 for ST

APPENDIX X

ECONOMIC ASSUMPTIONS USED

Structure Cost Assumptions

Based on Forest experience with other similiar improvement projects, the estimated cost of various habitat enhancement structures is as follows:

LARGE STRUCTURE (1,600 square foot pool)	$ 3,500
MEDIUM STRUCTURE (410 square foot pool).	$ 1,000
SMALL STRUCTURE (80 square foot pool).	$ 400
LARGE BOULDER (40 square foot pool).	$ 100
MEDIUM BOULDER (30 square foot pool)	$ 80
SMALL BOULDER (20 square foot pool).	$ 60

Fish Values (taken from reference 9)

Fish values used for the following economic analysis are as follows:

Chinook salmon spawner	$ 550
Steelhead trout spawner.	$ 359

Accessibility Coeffficient

The Accessibility Coefficient (AC) is a numerical value ranging from 1.0 to 2.0. The coefficient value reflects an estimate of the impact difficult accessibility has on enhancement structure construction cost (travel time, availability of natural construction materials adjacent to the site, etc.). A generalized description of the range in values used in this document is as follows:

AC value of 1.0

Developed road adjacent to stream reach, and all natural materials required (rock, logs, etc.) available along the the entire reach.

AC value of 2.0

No developed road adjacent to stream reach (either cross-country travel to the reach or along the reach channel) and/or most of the natural materials needed will have to be hauled to the site from a significant distance.

The specific number assigned to a reach reflects a judgement decision based on familiarity with the specific reach being considered.

Present Net Value and Benefit:Cost Ratio

The assumptions used in the calculation of present net value and benefit:cost ratios are:

1. Project work will be accomplished over a ten (10) year period.
2. Projects have a average effective life span of 30 years.
3. The discount rate is 4.0 percent
4. The discounting formula is $\frac{1}{(1.04)^n}$. (Note: n = midpoint of the year group.)

Year group discounting percentages are as follows:

1-10 year period (5 year mid-point) = 0.82%
11-20 year period (15 year mid-point) = 0.56%
21-30 year period (25 year mid-point) = 0.38%

APPENDIX XI

STRUCTURE/COST SUMMARY

DRAINAGE	Stream	Reach	Access Coeff. 1/	STRUCTURES 2/ Large No.	Large Cost	Medium No.	Medium Cost	Small No.	Small Cost	BOULDERS 2/ Large No.	Large Cost	Medium No.	Medium Cost	Small No.	Small Cost	Estimated Total Cost 3/
UMATILLA	Main Stem	A	1.3	1	3,500	36	36,000	12	4,800	180	18,000					80,990
	Ryan	A	1.8			46	46,000	46	18,400					460	27,600	165,600
	North Fork	A	1.1	1	3,500			3	1,200			50	4,000			9,570
	South Fork	A	1.1	1	3,500	8	8,000	18	7,200	300	30,000					53,570
		B	1.1	4	14,000	75	75,000	87	34,800	870	87,000					231,880
		C	1.4					26	10,400					130	7,800	25,480
		D	1.8					5	2,000					20	1,200	5,760
	Buck	A	n/a													0
	Thomas	A	1.0			25	25,000	100	10,000			375	30,000			65,000
		B	1.0					60	6,000					150	9,000	15,000
	Spring	A	1.8					14	5,600					70	4,200	17,640
	Shimmihorn	A	2.0					11	4,400							8,800
	Pearson	A	1.0			50	50,000	144	57,600			960	76,800			184,400
	Sub-totals	n/a	n/a	7	24,500	240	190,000	526	210,400	1,350	135,000	1,385	110,800	830	49,800	863,690
MEACHAM	Main Stem	A	1.0	3	10,500	80	80,000	60	24,000	900	90,000					204,500
	Boston	A	1.6					22	8,800					10	600	15,040
	Camp	A	1.3					32	12,800					160	9,600	29,120
	North Fork	A	1.7			20	20,000	30	12,000					300	18,000	85,000
		B	2.0					10	4,000					400	24,000	56,000
	Bear	A	1.7					10	4,000					60	3,600	12,920
	Hoskins	A	2.0					5	2,000					10	600	5,200
	Pot	A	2.0					30	12,000					50	3,000	30,000
	Trap	A	1.9					20	8,000					20	1,200	17,480
	South Fork	A	1.0			10	10,000	54	21,600			354	28,320			59,920
		B	1.0			75	75,000	100	40,000					1,000	60,000	175,000
		C	1.0			22	22,000	22	8,800					220	13,200	44,000
	Butcher	A	1.5					16	6,400					80	4,800	16,800
	East Fork	A	1.2					10	4,000					20	1,200	6,240
		B	2.0					14	5,600							11,200
	Owsley	A	1.5					22	8,800					130	7,800	24,900
	Sub-totals	n/a	n/a	3	10,500	207	207,000	455	182,800	900	90,000	354	28,320	2,460	147,600	793,320
GRAND TOTALS		n/a	n/a	10	35,000	447	397,000	981	393,200	2,200	225,000	1,739	139,120	3,290	197,400	1,657,010

1/ Explained in Appendix X.
2/ Costs per structure class taken from Appendix X.
3/ Sum of total costs multiplied by the Access Coefficient.

APPENDIX XII

ALTERNATIVE 'B' SMOLT PRODUCTION RESULTING FROM HABITAT ENHANCEMENT
(same as Appendix VIII)

DRAINAGE	Stream	Reach	Large Structure No. 1/	Large Structure Smolt Production CH	Large Structure Smolt Production ST 2/	Medium Structure No. 1/	Medium Structure Smolt Production CH	Medium Structure Smolt Production ST 2/	Small Structure No. 1/	Small Structure Smolt Production CH	Small Structure Smolt Production ST 2/	Placed Boulder No. 1/	Placed Boulder Smolt Production CH	Placed Boulder Smolt Production ST 2/	TOTAL ENHANCED SMOLT PRODUCTION CH	TOTAL ENHANCED SMOLT PRODUCTION ST
UMATILLA	Main Stem	A	1	200	60	36	2,700	900	12	144	240	180	6,300	1,440	9,344	2,640
	Ryan	A	0	0	0	46	0	2,070	46	0	2,070	460	0	2,300	0	6,440
	North Fork	A	1	200	60	0	0	0	3	150	36	50	125	25	475	121
	South Fork	A	1	200	60	8	600	200	18	900	216	300	10,500	2,400	12,200	2,875
		B	4	800	240	75	5,625	1,875	87	4,350	1,044	870	30,450	6,960	41,225	10,119
		C	0	0		0	0	0	26	0	520	130	0	650	0	1,170
		D	0	0		0	0	0	5	0	100	20	0	100	0	200
	Buck	A	0	0		0	0	0	0	0	0	0	0	0	0	0
	Thomas	A	0	0		25	0	1,125	100	0	2,000	375	0	3,000	0	6,125
		B	0	0		0	0	0	60	0	1,200	150	0	750	0	1,950
	Spring	A	0	0		0	0	0	14	0	280	70	0	140	0	420
	Shimmiehorn	A	0	0		0	0	0	11	0	220	0	0	0	0	220
	Pearson		0	0		50	0	2,250	144	0	2,880	960	0	7,680	0	12,810
	Sub-totals	N/A	7	1,400	420	240	8,925	8,420	526	5,544	10,806	3565	47,375	25,445	63,244	45,090
MEACHAM	Main Stem	A	3	600	180	80	6,000	2,000	60	3,000	720	900	31,500	7,200	41,100	10,100
	Boston	A	0	0	0	0	0	0	22	0	440	10	0	200	0	640
	Camp	A	0	0	0	0	0	0	32	0	640	160	0	800	0	1,440
	North Fork	A	0	0	0	20	0	900	30	0	600	300	0	1,500	0	2,700
		B	0	0	0	0	0	0	10	0	200	400	0	2,000	0	2,200
	Bear	A	0	0	0	0	0	0	10	0	200	60	0	300	0	500
	Hoskins	A	0	0	0	0	0	0	5	0	100	10	0	50	0	50
	Pot	A	0	0	0	0	0	0	30	0	600	50	0	250	0	250
	Trap	A	0	0	0	0	0	0	20	0	400	20	0	100	0	500
	South Fork	A	0	0	0	10	0	450	54	0	1,080	354	0	1,770	0	3,300
		B	0	0	0	75	0	3,375	100	0	2,000	1000	0	5,000	0	10,375
		C	0	0	0	22	0	990	22	0	440	220	0	1,100	0	2,530
	Butcher	A	0	0	0	0	0		16	0	320	80	0	450	0	770
	East Fork	A	0	0	0	0	0		10	0	200	20	0	100	0	300
		B	0	0	0	0	0		12	0	240	0	0	0	0	240
	Owsley	A	0	0	0	0	0		22	0	440	130	0	650	0	1,090
	Sub-totals	N/A	3	600	180	207	6,000	7,715	455	3,000	8,620	3714	31,500	21,470	41,100	36,985
GRAND TOTALS		N/A	10	2,000	600	447	14,925	16,135	981	8,544	19,426	7279	78,875	46,915	104,344	82,075

1/ - Numbers obtained from Appendix VI.
2/ - Numbers obtained from assumptions and process in Appendix VI.

APPENDIX XIII

ALTERNATIVE 'C' SMOLT PRODUCTION RESULTING FROM HABITAT ENHANCEMENT

DRAINAGE	Stream	Reach	Large Structure No. 1/	Large Structure Smolt Production 2/ CH	Large Structure Smolt Production 2/ ST	Medium Structure No. 1/	Medium Structure Smolt Production 2/ CH	Medium Structure Smolt Production 2/ ST	Small Structure No. 1/	Small Structure Smolt Production 2/ CH	Small Structure Smolt Production 2/ ST	Placed Boulder No. 1/	Placed Boulder Smolt Production 2/ CH	Placed Boulder Smolt Production 2/ ST	TOTAL ENHANCED SMOLT PRODUCTION CH	TOTAL ENHANCED SMOLT PRODUCTION ST
UMATILLA	Main Stem	A	1	200	60	36	2,700	900	12	144	240	180	6,300	1,440	9,354	2,640
	Ryan	A	0	0	0	46	0	2,070	46	0	2,070	460	0	2,300	0	6,440
	North Fork	A	1	200	60	0	0	0	3	150	36	50	125	25	475	121
	South Fork	A	1	200	60	8	600	200	18	900	216	300	10,500	2,400	12,200	2,875
		B	4	800	240	75	5,625	1,875	87	4,350	1,044	870	30,450	6,960	41,225	10,119
		C	0	0		0	0	0	26	0	520	130	0	650	0	1,170
		D	0	0		0	0	0	5	0	100	20	0	100	0	200
	Buck	A	0	0		0	0	0	0	0	0	0	0	0	0	0
	Thomas	A	0	0		25	0	1,125	100	0	2,000	375	0	3,000	0	6,125
		B	0	0		0	0	0	60	0	1,200	150	0	750	0	1,950
	Spring	A	0	0		0	0	0	14	0	280	70	0	140	0	420
	Shimmiehorn	A	0	0		0	0	0	11	0	220	0	0	0	0	220
	Pearson		0	0		50	0	2,250	144	0	2,880	960	0	7,680	0	12,810
	Sub-totals	N/A	7	1,400	420	240	8,925	8,420	526	5,544	10,806	3565	47,375	25,445	63,244	45,091
MEACHAM	Main Stem	A	3	600	180	80	6,000	2,000	60	3,000	720	900	31,500	7,200	41,100	10,100
	Boston	A	0	0	0	0	0	0	22	0	440	10	0	200	0	640
	Camp	A	0	0	0	0	0	0	32	0	640	160	0	800	0	1,440
	South Fork	A	0	0	0	10	0	450	54	0	1,080	354	0	1,770	0	3,300
		B	0	0	0	75	0	3,375	100	0	2,000	1000	0	5,000	0	10,375
		C	0	0	0	22	0	990	22	0	440	220	0	1,100	0	2,530
	Butcher	A	0	0	0	0	0	1	16	0	320	80	0	450	0	770
	East Fork	A	0	0	0	0	0	1	10	0	200	20	0	100	0	300
		B	0	0	0	0	0	1	12	0	240	0	0	0	0	240
	Owsley	A	0	0	0	0	0	1	22	0	440	130	0	650	0	1,090
	Sub-totals	N/A	3	600	180	187	6,000	6,815	350	3,000	6,520	2874	31,500	17,270	41,100	30,785
GRAND TOTALS		N/A	10	2,000	600	427	14,925	15,235	876	8,544	17,326	6439	78,875	42,715	104,344	75,876

1/ - Numbers from Appendix VI (with N. Fk. Meacham deleated).
2/ - Numbers from Appendix XII.

APPENDIX XIV

ADULT SPAWNER PRODUCTION RESULTING FROM HABITAT ENHANCEMENT
FOR ALTERNATIVES 'B' and 'C'

DRAINAGE	Stream	Reach	ALTERNATIVE 'B' (same as Appendix IX) SMOLTS 1/ CH	ST	ADULT SPAWNERS 2/ CH	ST	ALTERNATIVE 'C' SMOLTS 1/ CH	ST	ADULT SPAWNERS 2/ CH	ST
UMATILLA	Main Stem	A	9,344	3,640	58.4	17.6	9,344	2,640	58.4	17.6
	Ryan	A	0	6,440	0.0	42.9	0	6,440	0.0	42.9
	North Fork	A	475	121	3.0	0.8	475	121	3.0	0.8
	South Fork	A	12,220	2,875	76.4	19.2	12,220	2,875	76.4	19.2
		B	41,224	10,119	257.8	67.5	41,224	10,119	257.8	67.5
		C	0	1,170	0.0	7.8	0	1,170	0.0	7.8
		D	0	200	0.0	1.3	0	200	0.0	1.3
	Buck	A	0	0	0.0	0.0	0	0	0.0	0.0
	Thomas	A	0	6,125	0.0	40.8	0	6,125	0.0	40.8
		B	0	1,950	0.0	13.0	0	1,950	0.0	13.0
	Spring	A	0	420	0.0	2.8	0	420	0.0	2.8
	Shimmiehorn	A	0	220	0.0	1.5	0	220	0.0	1.5
	Pearson	A	0	12,810	0.0	85.4	0	12,810	0.0	85.4
	Sub-totals	N/A	63,244	45,091	395.6	300.6	63,245	45,090	395.6	300.6
MEACHAM	Main Stem	A	41,100	10,100	256.9	67.3	41,100	10,100	256.9	67.3
	Boston	A	0	640	0.0	4.3	0	640	0.0	4.3
	Camp	A	0	1,440	0.0	9.6	0	1,440	0.0	9.6
	North Fork	A	0	2,700	0.0	18.0	0	0	0.0	0.0
		B	0	2,200	0.0	14.7	0	0	0.0	0.0
	Bear	A	0	500	0.0	3.3	0	0	0.0	0.0
	Hoskins	A	0	50	0.0	0.3	0	0	0.0	0.0
	Pot	A	0	850	0.0	5.7	0	0	0.0	0.0
	Trap	A	0	250	0.0	1.7	0	0	0.0	0.0
	South Fork	A	0	3,300	0.0	22.0	0	3,300	0.0	22.0
		B	0	10,375	0.0	69.2	0	10,375	0.0	69.2
		C	0	2,530	0.0	16.9	0	2,530	0.0	16.9
	Butcher	A	0	770	0.0	5.1	0	770	0.0	5.1
	East Fork	A	0	300	0.0	2.2	0	300	0.0	2.2
		B	0	240	0.0	1.6	0	240	0.0	1.6
	Owsley	A	0	1,090	0.0	7.3	0	1,090	0.0	7.3
	Sub-totals	N/A	41,100	36,985	256.9	249.2	41,100	30,785	256.9	249.2
GRAND TOTALS		N/A	104,344	82,076	652.5	549.8	104,345	75,875	652.5	549.8

1/ - Figures taken from Appendix VIII (Total Enhanced Smolt Production)
2/ - Calcultated using smolts/adult spawner figures shown in Appendix VII.

APPENDIX XV

ADULT SPAWNER VALUES RESULTING FROM HABITAT ENHANCEMENT
FOR ALTERNATIVES 'B' and 'C'

			ALT. 'B'				ALT. 'C'			
		Reach	ADULT SPAWNERS 1/		ESTIMATED VALUE 2/		ADULT SPAWNERS 1/		ESTIMATED VALUE 2/	
DRAINAGE	Stream		CH	ST	CH	ST	CH	ST	CH	ST
UMATILLA	Main Stem	A	58	18	31,900	6,462	58	18	31,900	6,462
	Ryan	A	0	43	0	15,437	0	43	0	15,437
	North Fork	A	3	1	1,650	359	3	1	1,650	359
	South Fork	A	76	19	41,800	6,821	76	19	41,800	6,821
		B	258	68	141,900	24,412	258	68	141,900	24,412
		C	0	8	0	2,872	0	8	0	2,872
		D	0	1	0	359	0	1	0	359
	Buck	A	0	0	0	0	0	0	0	0
	Thomas	A	0	41	0	14,719	0	41	0	14,719
		B	0	13	0	4,667	0	13	0	4,667
	Spring	A	0	3	0	1,077	0	3	0	1,077
	Shimmihorn	A	0	2	0	718	0	2	0	718
	Pearson	A	0	85	0	30,515	0	85	0	30,515
	Sub-totals		395	301	217,250	108,059	395	301	217,250	108,059
MEACHAM	Main Stem	A	257	67	141,350	24,053	257	67	141,350	24,053
	Boston	A	0	4	0	1,436	0	4	0	1,436
	Camp	A	0	10	0	3,590	0	10	0	3,590
	North Fork	A	0	18	0	6,462	0	0	0	0
		B	0	15	0	5,385	0	0	0	0
	Bear	A	0	3	0	1,077	0	0	0	0
	Hoskins	A	0	1	0	359	0	0	0	0
	Pot	A	0	6	0	2,154	0	0	0	0
	Trap	A	0	2	0	718	0	0	0	0
	South Fork	A	0	22	0	7,898	0	22	0	7,898
		B	0	69	0	24,771	0	69	0	24,771
		C	0	17	0	6,103	0	17	0	6,103
	Butcher	A	0	5	0	1,795	0	5	0	1,795
	East Fork	A	0	2	0	718	0	2	0	718
		B	0	2	0	718	0	2	0	718
	Owsley	A	0	7	0	2,513	0	7	0	2,513
	Sub-totals		257	247	141,350	88,673	257	205	141,350	73,595
GRAND TOTALS			652	547	358,600	196,732	652	506	358,600	181,654

1/ Figures from Appendix IX.
2/ Derived using figures in Appendix X.

APPENDIX XVI

STRUCTURE/BOULDER COST SUMMARY FOR ALTERNATIVES 'B' and 'C'

DRAINAGE	Stream	Reach	ALTERNATIVE 'B' (same as Appendix XI) Structures	Boulders	Total Cost 1/	ALTERNATIVE 'C' Structures	Boulders	Total Cost 1/
UMATILLA	Main Stem	A	57,590	23,400	80,990	57,590	23,400	80,990
	Ryan	A	115,920	49,680	165,600	115,920	49,680	165,600
	North Fork	A	5,170	4,400	9,570	5,170	4,400	9,570
	South Fork	A	20,570	33,000	53,570	20,570	33,000	53,570
		B	136,180	95,700	231,880	136,180	95,700	231,880
		C	14,560	10,920	25,480	14,560	10,920	25,480
		D	3,600	2,160	5,760	3,600	2,160	5,760
	Buck	A	0	0	0	0	0	0
	Thomas	A	35,000	30,000	65,000	35,000	30,000	65,000
		B	6,000	9,000	15,000	6,000	9,000	15,000
	Spring	A	10,080	7,760	17,640	10,080	7,760	17,640
	Shimmihorn	A	8,800	0	8,800	8,800	0	8,800
	Pearson	A	107,600	76,800	184,400	107,600	76,800	184,400
	Sub-totals		521,070	342,620	863,690	521,070	342,620	863,690
MEACHAM	Main Stem	A	114,500	90,000	204,500	114,500	90,000	204,500
	Boston	A	14,080	960	15,040	14,080	960	15,040
	Camp	A	16,640	12,480	29,120	16,640	12,480	29,120
	North Fork	A	54,400	30,600	85,000	0	0	0
		B	8,000	48,000	56,000	0	0	0
	Bear	A	6,800	6,120	12,920	0	0	0
	Hoskins	A	4,000	1,200	5,200	0	0	0
	Pot	A	24,000	6,000	30,000	0	0	0
	Trap	A	15,200	2,280	17,480	0	0	0
	South Fork	A	31,600	28,320	59,920	31,600	28,320	59,920
		B	115,000	60,000	175,000	115,000	60,000	175,000
		C	30,800	13,200	44,000	30,800	13,200	44,000
	Butcher	A	9,600	7,200	16,800	9,600	7,200	16,800
	East Fork	A	4,800	1,440	6,240	4,800	1,440	6,240
		B	11,200	0	11,200	11,200	0	11,200
	Owsley	A	13,200	11,700	24,900	13,200	11,700	24,900
	Sub-totals		473,820	319,500	793,320	361,420	225,300	586,720
GRAND TOTALS			994,890	662,120	1,657,010	882,490	567,920	1,450,410

1/ Calculated using economic assumption shown in Appendix X and estimated total costs contained in Appendix XI (structure costs multiplied by Accessibility Coefficient).

APPENDIX XVII

BENEFIT:COST ANALYSIS FOR ALTERNATIVE "B" (without dam)

DRAINAGE	Stream	Reach	Discounted Benefit Value 1/ CH	ST	TOTAL	Discounted Enhancement Cost 2/	BENEFIT : COST RATIO	PRESENT NET VALUE
UMATILLA	Main Stem	A	561,420	113,731	675,151	66,412	10.2 : 1	608,739
	Ryan	A	0	271,692	271,692	135,792	2.0 : 1	135,900
	North Fork	A	29,040	6,318	35,358	7,847	4.5 : 1	27,511
	South Fork	A	576,840	120,050	696,890	43,927	15.9 : 1	652,963
		B	1,958,220	429,651	2,387,871	190,142	12.6 : 1	2,197,729
		C	0	50,547	50,547	20,894	2.4 : 1	29,653
		D	0	6,318	6,318	4,723	1.3 : 1	1,595
	Buck	A	0	0	0	0	n/a	n/a
	Thomas	A	0	259,054	259,054	53,300	4.9 : 1	205,754
		B	0	82,139	82,139	12,300	6.7 : 1	69,839
	Spring	A	0	18,955	18,955	14,465	1.3 : 1	4,490
	Shimmihorn	A	0	12,637	12,637	7,216	1.8 : 1	5,421
	Pearson	A	0	537,064	537,064	151,208	3.6 : 1	385,856
	Sub-totals		3,125,520	1,908,156	5,033,676	707,926	7.1 : 1	4,325,450
MEACHAM	Main Stem	A	2,487,760	423,333	2,911,093	167,690	17.4 : 1	2,743,403
	Boston	A	0	25,274	25,274	12,333	2.1 : 1	12,941
	Camp	A	0	63,184	63,184	23,120	2.7 : 1	40,064
	North Fork	A	0	113,731	113,731	69,700	1.6 : 1	44,031
		B	0	94,776	94,776	45,920	2.1 : 1	48,856
	Bear	A	0	18,956	18,956	10,578	1.8 : 1	8,378
	Hoskins	A	0	1,895	1,895	4,264	0.4 : 1	- 2,369
	Pot	A	0	37,910	37,910	24,600	1.5 : 1	13,310
	Trap	A	0	12,637	12,637	14,334	0.9 : 1	- 1,697
	South Fork	A	0	139,005	139,005	49,134	2.8 : 1	89,871
		B	0	435,970	435,970	143,500	3.0 : 1	292,470
		C	0	107,413	107,413	36,080	3.0 : 1	71,333
	Butcher	A	0	31,592	31,592	13,776	2.3 : 1	17,816
	East Fork	A	0	12,637	12,637	5,117	2.5 : 1	7,520
		B	0	12,637	12,637	9,184	1.4 : 1	3,453
	Owsley	A	0	44,229	44,229	20,418	2.2 : 1	23,8121
	Sub-totals		2,487,760	1,575,179	4,062,939	649,274	6.3 : 1	3,413,191
GRAND TOTALS			5,613,280	3,483,335	9,096,615	1,358,748	6.7 : 1	7,738,641

1/ - Calculated from estimated values contained in Appendix XV discounted over a 30 period (expected life of enhancement structures). Discount factors used for each 10 year period are shown in Appendix X.

2/ - Calculated from estimated costs contained in Appendix XI discounted over a 30 year period (expected life of structures). Discount factors used for each 10 year period are shown in Appendix X.

APPENDIX XVIII

BENEFIT:COST COMPARISON FOR ALTERNATIVE "B" (with dam)

DRAINAGE	Stream	Reach	Discounted Benefit Value 1/ CH	ST	TOTAL	Discounted Enhancement Cost 2/	BENEFIT : COST RATIO	PRESENT NET VALUE
UMATILLA	Main Stem	A	561,420	113,731	675,151	66,412	10.2 : 1	608,739
	Ryan	A	0	271,692	271,692	135,792	2.0 : 1	135,900
	North Fork	A	29,040	6,318	35,358	7,847	4.5 : 1	27,511
	South Fork	A	576,840	120,050	696,890	43,927	15.9 : 1	652,963
		B	1,958,220	429,651	2,387,871	190,142	12.6 : 1	2,197,729
		C	0	50,547	50,547	20,894	2.4 : 1	29,653
		D	0	6,318	6,318	4,723	1.3 : 1	1,595
	Buck	A	0	0	0	0	n/a	n/a
	Thomas	A	0	259,054	259,054	53,300	4.9 : 1	205,754
		B	0	82,139	82,139	12,300	6.7 : 1	69,839
	Spring	A	0	18,955	18,955	14,465	1.3 : 1	4,490
	Shimmihorn	A	0	12,637	12,637	7,216	1.8 : 1	5,421
	Pearson	A	0	537,064	537,064	151,208	3.6 : 1	385,856
	Sub-totals		3,125,520	1,908,156	5,033,676	707,926	7.1 : 1	4,325,450
MEACHAM	Main Stem	A	2,487,760	423,333	2,911,093	167,690	17.4 : 1	2,743,403
	Boston	A	0	25,274	25,274	12,333	2.1 : 1	12,941
	Camp	A	0	63,184	63,184	23,120	2.7 : 1	40,064
	North Fork	A	0	0	0	69,700	n/a	n/a
		B	0	0	0	45,920	n/a	n/a
	Bear	A	0	0	0	10,578	n/a	n/a
	Hoskins	A	0	0	0	4,264	n/a	n/a
	Pot	A	0	0	0	24,600	n/a	n/a
	Trap	A	0	0	0	14,334	n/a	n/a
	South Fork	A	0	139,005	139,005	49,134	2.8 : 1	89,871
		B	0	435,970	435,970	143,500	3.0 : 1	292,470
		C	0	107,413	107,413	36,080	3.0 : 1	71,333
	Butcher	A	0	31,592	31,592	13,776	2.3 : 1	17,816
	East Fork	A	0	12,637	12,637	5,117	2.5 : 1	7,520
		B	0	12,637	12,637	9,184	1.4 : 1	3,453
	Owsley	A	0	44,229	44,229	20,418	2.2 : 1	23,812
	Sub-totals		2,487,760	1,295,274	3,783,034	649,274	5.8 : 1	3,133,760
GRAND TOTALS			5,613,280	3,203,430	8,816,710	1,358,748	6.5 : 1	7,457,962

1/ - Calculated from estimated values contained in Appendix XV discounted over a 30 year period (expected life of enhancement structures). Discount factors used for each 10 year period shown in Appendix X.

2/ - Calculated from estimated costs contained in Appendix XI discounted over a 30 year period (expected life of structures). Discount factors used for each 10 year period shown in Appendix X.

APPENDIX XIX

BENEFIT:COST COMPARISON FOR ALTERNATIVE "C"

DRAINAGE	Stream	Reach	Discounted Benefit Value 1/ CH	ST	TOTAL	Discountedt Enhancement Cost 2/	BENEFIT : COST RATIO	PRESENT NET VALUE
UMATILLA	Main Stem	A	561,420	113,731	675,151	66,412	10.2 : 1	608,739
	Ryan	A	0	271,692	271,692	135,792	2.0 : 1	135,900
	North Fork	A	29,040	6,318	35,358	7,847	4.5 : 1	27,511
	South Fork	A	576,840	120,050	696,890	43,927	15.9 : 1	652,963
		B	1,958,220	429,651	2,387,871	190,142	12.6 : 1	2,197,729
		C	0	50,547	50,547	20,894	2.4 : 1	29,653
		D	0	6,318	6,318	4,723	1.3 : 1	1,595
	Buck	A	0	0	0	0	n/a	n/a
	Thomas	A	0	259,054	259,054	53,300	4.9 : 1	205,754
		B	0	82,139	82,139	12,300	6.7 : 1	69,839
	Spring	A	0	18,955	18,955	14,465	1.3 : 1	4,490
	Shimmihorn	A	0	12,637	12,637	7,216	1.8 : 1	5,421
	Pearson	A	0	537,064	537,064	151,208	3.6 : 1	385,856
	Sub-totals		3,125,520	1,908,156	5,033,676	707,926	7.1 : 1	4,325,450
MEACHAM	Main Stem	A	2,487,760	423,333	2,911,093	167,690	17.4 : 1	2,743,403
	Boston	A	0	25,274	25,274	12,333	2.1 : 1	12,941
	Camp	A	0	63,184	63,184	23,120	2.7 : 1	40,064
	North Fork	A	0	0	0	0	n/a	n/a
		B	0	0	0	0	n/a	n/a
	Bear	A	0	0	0	0	n/a	n/a
	Hoskins	A	0	0	0	0	n/a	n/a
	Pot	A	0	0	0	0	n/a	n/a
	Trap	A	0	0	0	0	n/a	n/a
	South Fork	A	0	139,005	139,005	49,134	2.8 : 1	89,871
		B	0	435,970	435,970	143,500	3.0 : 1	292,470
		C	0	107,413	107,413	36,080	3.0 : 1	71,333
	Butcher	A	0	31,592	31,592	13,776	2.3 : 1	17,816
	East Fork	A	0	12,637	12,637	5,117	2.5 : 1	7,520
		B	0	12,637	12,637	9,184	1.4 : 1	3,453
	Owsley	A	0	44,229	44,229	20,418	2.2 : 1	23,8121
	Sub-totals		2,487,760	1,295,274	3,783,034	480,352	7.9 : 1	3,302,682
GRAND TOTALS			5,613,280	3,483,335	9,096,615	1,188,278	7.7 : 1	7,908,337

1/ - Calculated from estimated values contained in Appendix XV discounted over a 30 year period (expected life of enhancement structures). Discount factors used for each 10 year period shown in Appendix X.

2/ - Calculated from estimated costs contained in Appendix XI discounted over a 30 year period (expected life of enhancement structures). Discount factors used for each 10 year period shown in Appendix X.

APPENDIX XX

Umatilla River Anadromous Fish Habitat Improvement

A search of maps and files in the Supervisor's Office indicates numerous sites and ticklers. Ticklers are portions of information regarding the location of possible cultural resources from archives, informants and other literature sources.

For a brief description of the sites and ticklers see below. Resources are recorded by township, range, section, number present within a section and district. Approximate locations of ticklers and site locations are given on the enclosed maps.

Thimbleberry Mountain: 1N37.30-1W is an unknown structure. 1N37.17-1W is a corral constructed under a special use permit in 1908.

Mecham: 1N35.35-1W is an abanded, collapsed railroad tunnel dating between 1882 and 1945. This is a recorded site.

Duncan: 1S36.8-1W is also on the Northwestern portion of section 8 Huron Quad. It is a homestead filed in 1905 consisting of a log house and barn. 1N36.9-1W is the Duncan Ranger Station and/or a painted five room house on either the SW or SE bank of Camp Creek. 1N36.9-2W is a homestead filed in 1908 consisting of a box house and a log barn. 2N36.1-2W is part of an old indian trail system and is also shown on Gibbon and Bingham Springs maps.

Gibbon: 2N36.1-2W is described above. 3N36.34-1W is a homestead filed in 1902 consisting of a log house, a lumber house and a log chicken house.

Bingham Springs: 2N36.1-2W see Duncan for description. 3N37.22-1W is two cabins on the East side of the river. 3N37.22-2W built in 1939 by CCC may actually be one of cabins of 3N37.22-1W. 3N37.22-3W is two unknown structures. 2N37.17-1W is a corral constructed by E.S. Wilbur in 1908 under a special use permit.

Huron: 2N 35.36-1W is a portion of the trail traveled by Marcus and Narcissa Whitman. 1S36.8-1W see Duncan for description.

NOTE: Specific maps of the above locations are on file at the Walla Walla Ranger District.

Barbara Ann White

Barbara Ann White
S.O. Archaeologist

November 5, 1984

APPENDIX XXI

REFERENCES USED

1. Environmental Impact Statement, Elgin Land Management Plan, Umatilla National Forest. 1978.

2. Environmental Impact Statement, Desolation Land Management Plan, Umatilla National Forest. 1979.

3. 1984 Columbia River Basin Fish and Wildlife Program, Northwest Power Planning Council. Adopted Nov. 15, 1982, Amended Oct. 10, 1984.

4. Recommended Salmon and Steelhead Habitat Improvement Measures, Confederated Tribes of the Umatilla Indian Reservation. 1984.

5. Fish Distribution map for the Umatilla National Forest.

6. Oregon Department of Fish and Wildlife stream survey data.

7. Umatilla National Forest stream survey data.

8. Conversations with John Andrews, Fish Biologist, Umatilla National Forest.

9. Meyer, Philip A., Net Economic Values for Salmon and Steelhead from the Columbia River System. NOAA Tech. Memo. NMFAS F/NWR - 3, National Marine Fisheries Service. 1982.

FINDING OF NO SIGNIFICANT IMPACT

PROPOSED
FISH PASSAGE IMPROVEMENTS
AT
THREE MILE FALLS DIVERSION DAM
UMATILLA RIVER, OREGON

PREPARED BY
BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION

IN COOPERATION WITH
BONNEVILLE POWER ADMINISTRATION

MAY 1986

FINDING OF NO SIGNIFICANT IMPACT

PROPOSED FISH PASSAGE IMPROVEMENTS AT THREE MILE FALLS DIVERSION DAM UMATILLA RIVER, OREGON

Prepared by the
Bureau of Reclamation
Pacific Northwest Region
Boise, Idaho

PN FONSI 86-2

In Cooperation with:
Bonneville Power Administration
Department of Energy

DOE FONSI - 0278

The Bureau of Reclamation proposes to administer the construction of fish passage and protective facilities at Three Mile Falls Diversion Dam on the Umatilla River in Oregon to increase the numbers of anadromous fish. The Bonneville Power Administration (BPA) proposes to provide funding for the project. These agencies' actions would implement section 904(d) of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program which addresses the provision of offsite enhancement to compensate for fish and wildlife losses caused by hydroelectric project development and operations throughout the Columbia River Basin. This Finding of No Significant Impact (FONSI) is the National Environmental Policy Act (NEPA) decision document for both agencies.

Three Mile Falls Diversion Dam currently includes fish ladders on both the left and right ends of the structure. They are, however, inadequate by today's standards to effectively aid in passage of fish. Problem areas include poor ladder entrance and exit conditions, inappropriate design to direct flows in a way that will attract the fish to the ladders, and debris accumulation in the tailrace area. The provision of adequate fish passage and protective facilities at Three Mile Falls Diversion Dam would be a very important step in reestablishing the historically large chinook salmon runs and enhancing steelhead runs in the Umatilla basin.

The proposed action would improve both upstream and downstream passage by providing a new right bank ladder on Three Mile Falls Diversion Dam, modifying the existing left bank ladder, and installing rotary drum fish screens and related structures on the adjacent West Extension Irrigation District (WEID) Canal. Four other alternatives are considered in the environmental assessment (EA): a concrete apron plus a left bank ladder; a cap on the crest of the dam plus a left bank ladder; dam removal; and no action.

The EA was distributed for review and comment to approximately 300 individuals, organizations, and Government agencies. The eighteen letters of comment received, along with the Bureau's responses to specific comments, are enclosed in this document following the EA.

The proposed fish passage improvements would have effects on the anadromous and resident fish populations which, viewed in the context of the Umatilla River basin, would be beneficial. Resident fish would receive incidental benefits from reduced mortalities at the diversion structures. However, given the regional context, as specified in the Northwest Power Planning Council's Fish and Wildlife Program, in which the proposed passage improvements would be implemented and the large increase in anadromous fish production necessary to restore historical population levels, the proposed actions are not considered to have significant environmental impacts. Information from the enclosed EA which supports that determination is summarized in the following paragraphs.

Due to the nature of the project, there are no practicable alternatives to modifying the existing dam and fish passage facilities in a flood plain area of the Umatilla River. All practicable measures to minimize harm to or within the flood plain are included in the proposal. The project will be consistent with the policies set forth in Executive Order 11988--Floodplain Management. All facilities proposed for construction in the flood plain will be designed to withstand flooding; none of the projects will involve an adverse impact of floods on human safety, health, or welfare because they will not diminish channel discharge capacity or contribute hazardous wastes to the flood waters; and the program will restore and enhance the natural and beneficial values of flood plains by restoring and enhancing a component of the flood plain ecosystem--the fish population.

The construction site presently has only minimal vegetation due to activities associated with the existing diversion. Care will be taken during construction activity to minimize the destruction of riparian vegetation. Also, any disturbed areas not needed for permanent facilities will be landscaped and revegetated as soon as possible after construction is completed. As with flood plains, the proposed program will restore and enhance a beneficial component of the riparian wetland ecosystem by restoring and enhancing the fish population. Therefore, the proposed program will be consistent with Executive Order 11990--Protection of Wetlands.

The activities to be included in the proposed action and the other action alternatives will be within a very confined area which contains no known cultural or historical sites. The State Historic Preservation Officer (SHPO) has verified that no sites are located in the affected area. An on-the-ground survey will be conducted prior to initiation of construction activities. The Advisory Council on Historic Preservation Regulations 36 CFR 800 will be followed if sites are found.

Construction and modification of the fish ladders and the fish screens will cause occasional and short-term increases in river turbidity. During construction, contractors will be required to use all available procedures for control of water pollution to assure that turbidity levels do not exceed Oregon water quality standards. These measures will include the use of clean gravel or driven sheet pile to construct cofferdams (for dewatering the fish ladder construction areas) and the timing of the construction to coincide with low flow periods (see EA, pages 27 and 28).

The program proposal was evaluated with respect to current legislation affecting Federal projects and has been found to comply with the applicable laws and regulations. Also, see the cited pages in the EA for discussions on

why this program, in conjunction with the stipulated mitigating measures, would have insignificant effects on the following areas of concern: (1) air quality (EA, pages 31-32); (2) noise (EA, page 32); (3) wildlife (EA, pages 28 and 29); and (4) threatened and endangered species (EA, page 29).

According to Federal and State sources, there are no Wild and Scenic Rivers, National Trails, or designated or proposed wilderness areas in the immediate project vicinity. The various alternatives will not change the existing land use, which is diversion of water for agricultural purposes. The proposed project will be consistent with existing State and local land use plans and has been coordinated with the appropriate Federal, State, and local governmental agencies and interested parties. No farmlands will be converted to other uses or be indirectly affected by the various alternatives. None of the alternatives involve the treatment, storage, or disposal of solid or hazardous wastes or pesticides. Other documents that have been prepared by various governmental agencies and discuss proposed enhancements of the Umatilla basin and associated environmental impacts are cited in section I.C. of the EA.

Copies of the Finding of No Significant Impact, including the EA and letters of comment, are being sent to persons and agencies named in the mailing list (EA, section IV.C.). Additional copies are available upon request from the Bureau of Reclamation, Attention: 150, Box 043, 550 West Fort Street, Boise, Idaho 83724, telephone (208)334-1207.

Based on a thorough review of the comments received and analysis of the environmental impacts as presented in the EA, the Bureau has concluded that implementation of the proposed action would not have a significant effect on the quality of the human environment. This Finding of No Significant Impact has therefore been prepared and is submitted to document environmental review and evaluation in compliance with the National Environmental Policy Act of 1969.

Recommended:

Larry Kinsinkaler 5-5-86
Regional Planning Officer Date

John R. Woodwatt 5/5/86
Regional Environmental Officer Date

Approved:

R. W. Floyd 5-5-86
Regional Director Date

Cooperating Agency:

Department of Energy, Bonneville Power Administration

The EA has been reviewed with respect to BPA's involvement in proposed action. The EA presents an adequate assessment of the environmental effects associated with the proposed action and, accordingly, the Department of Energy is adopting the EA.

Based on the information contained in the EA and the results of the public review, the Department of Energy is determining that BPA's proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act. Therefore, an environmental impact statement is not required.

Assistant Secretary for
Environment, Safety and Health

Date

ENVIRONMENTAL ASSESSMENT

FISH PASSAGE IMPROVEMENTS

AT

THREE MILE FALLS DIVERSION DAM,

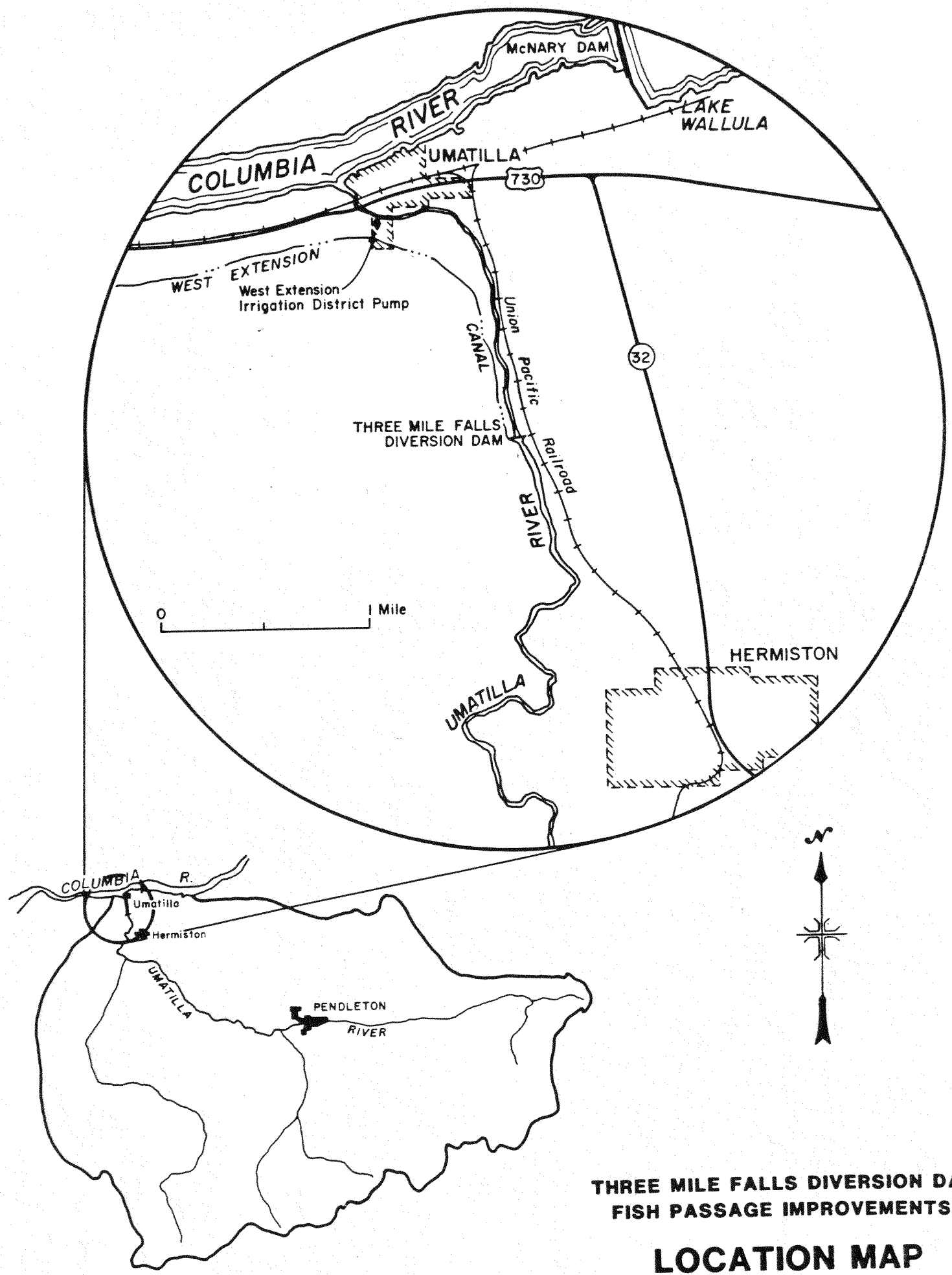
UMATILLA RIVER, OREGON

NOVEMBER 1985
(Revised February 1986)

Prepared by:

Bureau of Reclamation
Pacific Northwest Region
Boise, Idaho

In Cooperation with:
Bonneville Power Administration
Portland, Oregon



THREE MILE FALLS DIVERSION DAM
FISH PASSAGE IMPROVEMENTS

LOCATION MAP

November 1984

1022-100-39

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I. PURPOSE AND NEED

A. Need for Action

1. General History and Nature of Passage Problem

Historically, the Umatilla River produced large numbers of summer steelhead and fall and spring chinook salmon. No actual population estimates are available prior to the construction of Three Mile Falls Diversion Dam in 1914, but reports of "thousands and thousands" of salmon being caught from spring to fall in the lower Umatilla River by both Indians and non-Indians are documented (1).[1/]

The construction of Three Mile Falls Diversion Dam eliminated all chinook salmon and drastically reduced runs of summer steelhead on the Umatilla River. Present runs of steelhead have averaged less than 2,000 returning adults for the past 14 years. Additional causes for the reduced runs include a hydroelectric project built in 1910 on the Umatilla River and dams on the main stem of the Columbia.

The Umatilla River basin has an abundance of spawning gravel and potential habitat for both steelhead and spring and fall chinook. The primary factors limiting populations in the basin are low flows exacerbated by irrigation withdrawals and inadequate passage over irrigation diversion dams.

Three Mile Falls Diversion Dam currently includes fish ladders on both the left and right ends of the structure. They are, however, inadequate, by today's standards, to effectively aid in passage of fish. Problem areas include poor ladder entrance and exit conditions, inappropriate design to direct flows in a way which will attract the fish to the ladders, and debris accumulation in the tailrace area. The provision of adequate fish passage and protective facilities at Three Mile Falls Diversion Dam would be a very important step in reestablishing chinook salmon runs and enhancing steelhead runs in the Umatilla basin. These measures are a top priority of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and the State and Federal fish and wildlife agencies.

The proposed improvements were included among the priority actions presented in the Northwest Power Planning Council's Fish and Wildlife Program. To implement them, the Bonneville Power Administration (BPA) proposes to fund design and construction of the needed facilities. The Bureau of Reclamation would prepare the designs and oversee the construction activities.

2. Specific Passage Needs

a. Steelhead

Adult steelhead enter the Umatilla River in the late fall when the irrigation season has ended and natural flows begin increasing. As runoff increases to medium to high flows (about 500 ft^3/s or greater), a higher

---

[1/] A number in parentheses refers to the number of the reference in the "Literature Cited" section.

percentage of water spills over the crest of the dam, and attraction flows at both ladders become a smaller portion of the total flow. This creates a false attraction problem for steelhead in the tailrace area. The resulting migration delay creates increased stress and mortality when fish jump and become trapped in the open bays beneath the dam. An estimated 20 percent of the 1982-83 steelhead return was lost because of these conditions at Three Mile Falls Diversion Dam.

The existing left bank ladder is well designed for steelhead passage but lacks adequate attraction flows at the entrance during medium to high river flows. The right bank ladder is not adequately designed by today's standards. It has poor entrance conditions, poor turn pool conditions, poor exit conditions, and is not self-regulating. It also lacks adequate attraction water at all flow levels. Sediment naturally accumulates above the east side of the dam and restricts flow into the right bank ladder, thus impeding fish passage. There are no trapping or counting facilities at the right bank ladder and only marginal opportunities at the left bank ladder.

Debris hanging over the dam crest and accumulating in the tailrace area impedes lateral movement of steelhead along the base of the dam. This situation, combined with insufficient attraction flows at the ladder entrances, also creates migration delay and stress. Accumulation of debris above the east side of the dam restricts the amount of flow entering the right bank ladder. Failure to maintain control of debris above and below the right bank ladder may cause stranding of adult steelhead.

Juvenile steelhead migrate downstream past Three Mile Falls Diversion Dam by passing over the crest, through the fish ladders, or through the smolt bypass pipe on the west side. The bypass pipe drops fish 20 feet into the tailrace area below the dam. This may cause injury, stress, and possible mortality to smolts, especially during low flow conditions when the bedrock area below the pipe does not contain adequate pool depths. This condition is even worse for those smolts passing over the crest of the dam.

b. Fall Chinook

Adequate flows (assumed to be 200 ft^3/s or greater) for adult fish passage to Three Mile Falls Diversion Dam can occur during the October through December migration period. During this period, all the passage problems listed for adult steelhead would be common to fall chinook. These include false attraction flows below the dam, lack of adequate attraction to the ladder entrances, and debris and/or sediment above and below the dam. In addition to these problems, the overflow weir design of the right bank ladder does not promote chinook passage as would the vertical slot design. A submerged orifice or vertical slot is especially important for the ladder entrance. Migration delays are generally more harmful for fall chinook than for steelhead due to the relatively short period of time between migration and spawning.

During flow periods that could provide adequate fish passage, movement through the left bank ladder could be satisfactory. However, counting, trapping, and holding facilities are poor. During periods of extreme low flows, passage would be reduced or eliminated. Water temperature and swimming duration are not expected to cause passage problems.

Chinook downstream migrants would experience similar problems with injury, stress, and possible mortality from the juvenile bypass system as discussed for steelhead. Fall chinook sub-yearling migrants would experience higher mortality at the existing facilities than do steelhead smolts.

c. Spring Chinook

Medium to high flows often occur during the April and early May spring chinook migration period. With these conditions, problems listed for steelhead and fall chinook at Three Mile Falls Diversion Dam would also be common for spring chinook--false attraction flows below the dam, lack of adequate attraction to the ladder entrances, and/or sediment obstruction above and below the dam. In addition to these problems, the overflow weir design of the right bank ladder does not promote chinook passage as would a vertical slot design. A submerged orifice or vertical slot is especially important for the ladder entrance.

In late May and into June, flows can rapidly decrease to very low flow conditions because of irrigation diversions. Passage during these periods could be significantly reduced or even eliminated. Migration delays for spring chinook would have very serious implications because upstream passage to holding and spawning areas would be impossible later in the spring and into summer. This would especially be a problem during late May and early June for late arriving adults. During periods of adequate flows, movement through the left bank ladder could be satisfactory. However, existing counting, trapping, and holding facilities are inadequate. Temperature conditions and/or swimming duration are not expected to cause passage problems.

Spring chinook downstream migrants are expected to be yearling smolts. Spring chinook downstream migrants would experience the problems from injury, stress, and mortality with the juvenile bypass system similar to those listed earlier for steelhead and fall chinook.

B. Location and General Description

1. Purpose and Function of Dam

Three Mile Falls Diversion Dam is located on the Umatilla River approximately 3 miles south of Umatilla, Oregon. The dam, headworks, and right bank fish ladder were constructed by the Bureau of Reclamation in 1914 as an integral part of the Umatilla Project. It diverts water to the service area of the West Extension Irrigation District (WEID) through a 27-mile-long main canal. The diverted water is used to irrigate about 7,000 acres of farmland.

2. Ownership, Operation, and Maintenance Responsibility

Title to Three Mile Falls Diversion Dam is held by the United States. The Bureau of Reclamation initially operated and maintained the works until April 27, 1926, when the WEID assumed operation, maintenance, and replacement responsibility for the structure under contract with the Bureau of Reclamation.

Existing fish passage facilities at Three Mile Falls Diversion Dam include the original pool-and-weir ladder on the right bank (which was reopened in

1984 after being out of service for 20 years), a vertical slot ladder on the left bank, and a louver screen mounted at the intake of the WEID canal. The left bank ladder is used to trap and count fish by partially dewatering it and dip-netting individual fish and passing them over the dam. The Oregon Department of Fish and Wildlife (ODFW) has responsibility for this activity, and about 50 man-days a year are expended in its accomplishment.

Specific operation and maintenance responsibilities and funding sources have not been identified. Estimated annual operation and maintenance costs for the facilities outlined in the recommended plan are about $72,000. The Bureau of Reclamation has no authority to provide operation and maintenance funding for fish facilities at the dam and has asked BPA to pursue the possibility of their funding operation and maintenance of new fish passage facilities at Three Mile Falls Diversion Dam. It is assumed that Reclamation would be responsible for overseeing operation and maintenance activities. One possibility under consideration is to include the operation and maintenance function in the Yakima fish passage facilities program since Three Mile Falls Diversion Dam is reasonably close to the Yakima Project.

The WEID is responsible for debris removal along the face of the dam and from the louvers. The district has no responsibility for operation and maintenance activities at the right bank ladder. Estimated annual operation and maintenance expenses borne by WEID are $10,500, which includes $9,000 per year for labor (wages) and $1,500 for minor and ordinary maintenance and repairs on gates, louver screens, and other structures. About once every 8 to 10 years the district removes silt from just upstream of the east abutment and snags from the dam crest at an estimated cost of $4,000. The louvers were constructed by the Bureau of Commercial Fisheries (now National Marine Fisheries Service [NMFS]). Funding for annual maintenance and repair is passed to ODFW from NMFS in a program that includes fish screens throughout the Columbia Basin. No funding estimates are available specifically for Three Mile Falls Diversion Dam louvers.

3. Dam Design and Flow Characteristics

Three Mile Falls Diversion Dam is a concrete buttress dam with a maximum height of 24 feet and a crest length of 915 feet. The canal headworks at the diversion dam has a capacity of 375 cubic feet per second (ft^3/s). The canal capacity is 310 ft^3/s, and the historic peak diversion is 305 ft^3/s. Actual average monthly diversions for the period 1935-78 are 145 to 170 ft^3/s between April and September.

The buttress dam was designed to function as an overflow weir along its entire crest. During the normal irrigation season, (April-October), the WEID diverts available river water to meet its demands and passes any remainder over the dam crest. During periods of low flow, all the available water is diverted (up to the canal capacity) except for about 20 ft^3/s released through the downstream migrant pipe. The fish ladder is operated during periods of upstream steelhead migrations and requires about 20-40 ft^3/s for ladder operation.

During the nonirrigation season, all the riverflows in excess of the fish ladder and bypass pipe capacity are passed over the dam. As the flows increase over the dam, the proportion of total flow at the ladder entrance

decreases. The average flow conditions in the Umatilla River below the dam over the 44-year period 1935-78 are shown on page 3 of the Biological Assessment (Appendix A).

4. Existing Fish Passage Facilities

a. Right Bank Ladder.--During its initial construction, the dam was equipped with a low fish ladder on the right abutment (east bank). Additional weirs were constructed at the toe of the dam as part of the ladder in 1963. The right bank ladder is an overflow weir type containing 13 concrete pools, each 6 feet by 8 feet by 6 feet in size. This series of pools contain vertical drops ranging from 6 inches to 1 foot. This ladder was taken out of service in 1964 by backfilling it with earth. It was replaced by a new ladder on the west bank. However, in 1984 the right bank ladder was reopened by a group of volunteers, and successful passage of steelhead occurred when riverflows exceeded about 500 ft^3/s. Primary problems associated with the right bank ladder include false attraction flows along the face of the dam just west of the ladder entrance, obstructions in the channel below the entrance to the ladder, and sedimentation along the upstream face of the dam near the exit (upstream end) of the ladder. Also, the ladder does not contain trapping, holding, or counting facilities. No additional attraction water is provided to the ladder entrance.

b. Left Bank Ladder.--The left bank ladder on the west abutment of the dam is a vertical slot-type structure which was completed in August 1964. It was built by the state of Oregon under contract with the Bureau of Reclamation and the WEID. It has twenty-one 8-foot by 10-foot rectangular concrete pools. The floor slopes and the slots in the pools extend to the floor. The ladder is operated during periods of upstream anadromous fish migrations and uses about 20 to 40 ft^3/s for ladder operation depending upon forebay depths. When there is a difference of 20 feet between the forebay and tailwater, the ladder will operate with about 1-foot difference in water level between pools. A 12-inch-diameter pipe routes water from inside the upper pool through a diffuser in the lower pool to provide about 15 ft^3/s of additional attraction flows for adult anadromous fish.

The ladder is not designed for trapping, counting, and holding of adult anadromous fish. An electronic counter operated at the head of the left bank ladder for several years but has not been used recently. This counter was difficult to calibrate and gave inconsistent results. Consequently, a temporary conduit fyke-type trap is used in the upper four pools of the ladder for annual counting of summer steelhead. The pools are then partially dewatered, and the fish are individually dip-netted, counted, and passed over the dam. Steelhead brood stock selection (for the juvenile supplemental outplanting program) also occurs in this manner. Downstream juvenile migrants are passed either over the crest of the dam or through a bypass pipe that collects those fish which have been screened from the canal entrance.

c. Louver.--A louver screen is mounted at the intake of the WEID canal at the left abutment of the dam. The louver is approximately 30 feet long and consists of a series of fixed metal slats spaced about 1 to 2 inches apart. It prevents most steelhead smolts from entering the canal and directs them to the entrance of the bypass pipe.

d. Downstream Channel Improvements.--During 1984, modifications were made to the Umatilla River channel below Three Mile Falls Diversion Dam to improve upstream fish passage. This work, which was funded by BPA and designed and constructed by the Corps of Engineers and Oregon Department of Fish and Wildlife (ODFW), was about 90-percent complete at the end of the construction season in late 1984. An environmental assessment (EA) and finding of no significant impact (FONSI) were completed by BPA for this work in 1983. A research project will be conducted in 1985 to monitor the success of this project over a range of flows. According to ODFW (2), the river channel below the dam was observed to be a barrier to upstream passage of adult salmon and steelhead at flows less than 200 ft^3/s, and flows up to 300 ft^3/s were assumed to limit passage. With channel work near completion, a flow of 100 ft^3/s was assumed to be the minimum flow needed for adult passage. However, even with channel work, it is estimated that flows up to 150 ft^3/s will limit passage. Fish passage studies to be conducted in late 1985 should yield more information on optimum passage flow levels.

C. Other Related Actions and Activities

1. Confederated Tribes of the Umatilla Indian Reservation Salmon and Steelhead Enhancement Plan

a. Steelhead.--An implementation plan for enhancement of Umatilla River steelhead has been developed by the CTUIR and ODFW (3). Long-term escapement goals presented in this plan for summer steelhead in the basin are 5,400 hatchery-produced adult fish and 1,881 naturally produced adult fish under existing flows (2).

Hatchery production goals will be achieved through annual releases of 200,000 steelhead smolts at the existing Bonifer facility and the Minthorn acclimation facility currently under construction. The proposed Umatilla hatchery near Irrigon (in the predesign phase) will produce these fish. The 60,000 smolts that are currently being reared at existing ODFW facilities and released at Bonifer will continue at least until the Umatilla hatchery comes online. Any excess brood stock returning to the Bonifer and Minthorn facilities will be used for enhancement of natural production by reseeding (adult or egg outplanting) in underutilized habitat. BPA undertook NEPA compliance activities on the funding of the Bonifer Springs facility in 1983 and wrote an environmental assessment/finding of no significant impact on funding of the Minthorn Springs facility in 1984.

Riparian and instream habitat improvement needs were identified in the CTUIR Umatilla River basin report of January 1984 (3). These projects were submitted to the Northwest Power Planning Council in November 1983 as proposed amendments to the Fish and Wildlife Program of the Northwest Power Planning and Conservation Act of 1980. There is an excellent opportunity to vastly improve the natural production of anadromous fish habitat throughout the Umatilla basin through riparian and instream habitat improvements. BPA is considering funding fish enhancement projects recommended for the Umatilla basin in the Northwest Power Planning Council's Fish and Wildlife Program.

b. Fall Chinook.--The Umatilla Basin Implementation Plan (3) cites long-term escapement goals of 10,000 hatchery-produced and 11,097 naturally produced fall chinook salmon under existing flows (6).

225,000 yearlings are programmed for acclimation and release at the Bonifer and Minthorn facilities through 1987. Based upon the results of ongoing studies at Bonneville hatchery, the most cost-effective program for juvenile releases will be used. This may include yearling releases, fall reared smolts, or fingerlings. Based upon available data, a return of about 2,500 adult fish would result from either program. Returning adult fall chinook will be used as brood stock for hatchery production and to foster natural production in the system.

c. Spring Chinook.--Potential spring chinook spawning habitat exists in the upper main stem, lower North Fork, and South Fork Umatilla River and in Meacham Creek. The CTUIR and ODFW have plans for reestablishment of spring chinook in the Umatilla basin. Escapement goals are 10,000 hatchery-produced fish and 582 naturally produced fish under existing flows (6). However, poor spring passage conditions and lack of deep holding pools for adults could limit the production of these fish. To avoid or reduce potential passage problems, brood stock would be selected for early arrival of adults to avoid low streamflows. When introduced, adults would enter the Umatilla River in April and May and migrate to upstream resting pools near spawning grounds. Adults would hold over in these pools until spawning commenced in late August and September. Most juveniles would rear for a year prior to migration in April, May, and June. Additional spring chinook holding pools would be provided if it is determined that they would improve use of productive spawning and rearing areas.

2. Bureau of Reclamation Umatilla Basin Project

The Bureau of Reclamation recently completed a preliminary draft of a Planning Report/Environmental Statement on the Umatilla Project. This proposal emphasizes flow enhancement to help restore chinook runs and enhance steelhead runs in the Umatilla River basin. The proposal's major feature and recommended plan of development includes improving streamflows by "importing" water from the neighboring Columbia River. The Report/EIS will present the effects of comprehensive basin development for public review and comment.

The recommended plan under the Umatilla Basin Project includes a program to pump water from the Columbia into Cold Springs Reservoir for distribution to irrigators. Use of this imported water by irrigators would permit Umatilla River water which is now diverted or stored for irrigation use to remain in the Umatilla River to improve flow conditions in the lower basin. Structural features include a major pumping plant on the Columbia River (Lake Wallula), a relift pumping station, and carriage facilities. Increased streamflow in the lower Umatilla River in conjunction with improved fish passage at Three Mile Falls Diversion Dam would optimize passage conditions at the dam.

In addition to the pumping feature, the first development plan proposes improvements to fish passage facilities and installation of protective screens at some existing irrigation diversions. A significant plan feature is a post-construction monitoring program which would "fine tune" flow improvements and other measures in meeting fishery enhancement objectives. This monitoring program, now expected to extend over a 12-year period, would aid project operators and fishery experts in adjusting operations or proposing additional measures to meet fishery restoration goals.

Anticipated fishery benefits from the proposed basin plan include an increased natural escapement of about 11,300 fall chinook, 3,400 steelhead, and 700 spring chinook.

3. Power Generation Proposal--WEID

The WEID has been issued a preliminary permit by the Federal Energy Regulatory Commission (FERC) to study the feasibility of installing a powerplant in the town of Umatilla, Oregon. Water to run the proposed generator would be diverted at Three Mile Falls Diversion Dam through the WEID canal. The powerplant would be operated primarily during the winter and spring and could create a potential for icing of the new screens during cold weather periods. The final designs and specifications for the proposed powerplant should include thorough consideration of winter operating constraints and procedures to assure appropriate cold weather operation of the screens as well as minimum flows in the Umatilla River channel below Three Mile Falls Diversion Dam.

4. Permits

Prior to any construction, the Bureau of Reclamation will submit a joint Application for Permit to both the Army Corps of Engineers and State of Oregon, Division of Lands. This will comply with both section 404 of the Clean Water Act and appropriate State regulations for removal or filling of materials in waterways.

As part of this process, Reclamation will also comply with any local regulations governing alterations and/or development within a flood plain.

II. ALTERNATIVE IMPROVEMENT MEASURES

The study considered several potential measures which are discussed below. These include two fish ladders; a concrete apron plus improvements to the existing left bank ladder; a cap on the crest of the dam, plus improvements to the left bank ladder; dam removal; and no action.

A. Two Fish Ladders (PROPOSED ACTION)

1. Description of Facilities

a. Right Bank Ladder.--The main feature of this alternative would be the construction of a new right bank ladder to improve fish passage, In addition, this alternative includes modifications to the existing left bank ladder and the installation of rotary drum fish screens and related structures in the WEID canal.

The right bank fish ladder would be located just left of the existing pool-and-weir fish ladder (which is inadequately designed by today's standards and would become inoperable). A second ladder of adequate design at the dam would prevent stranding and delay of adult migrants that would make their way to the right side due to attraction flows over the dam. The new ladder would be a vertical slot design with a 15-inch-slot opening and a 10:1 sloping floor. Ten pools would be needed, with pools being 8 feet wide and 10 feet long. The overall length of the structure would be about 100 feet, with about 75 feet extending downstream from the crest of the dam (see figure 1).

An entrance pool would be excavated in the rock in front of the entrance structure. The entrance structure would have two gates, one for low flow conditions and one for high flow conditions. However, only one gate would be operated at any one time. Improved channels would be excavated downstream and along the toe of the dam leading to the two entrance gates, and secondary channels and potholes would be capped to facilitate better access to the entrance structure.

Auxiliary water to the entrance structure would be supplied by an overflow gate. The water would spill over the gate into a separate pool, through a baffle structure, and then through a diffuser grate before entering the entrance structure.

The exit structure would have a viewing station for viewing and counting fish, a fish crowder, and a trapping and sampling facility. The exit would be approximately 60 feet left of the exit for the existing pool-and-weir ladder which would help minimize the amount of silt accumulation. A retaining wall would extend upstream of the exit structure for ease of maintaining an open exit channel. Silt removal in the exit channel and debris removal from the dam crest and channels immediately downstream are essential maintenance tasks necessary to keep the fish ladder functional.

Adult fish could be trapped as they pass through the exit channel just beyond the viewing station. Fish would be diverted into a separate holding

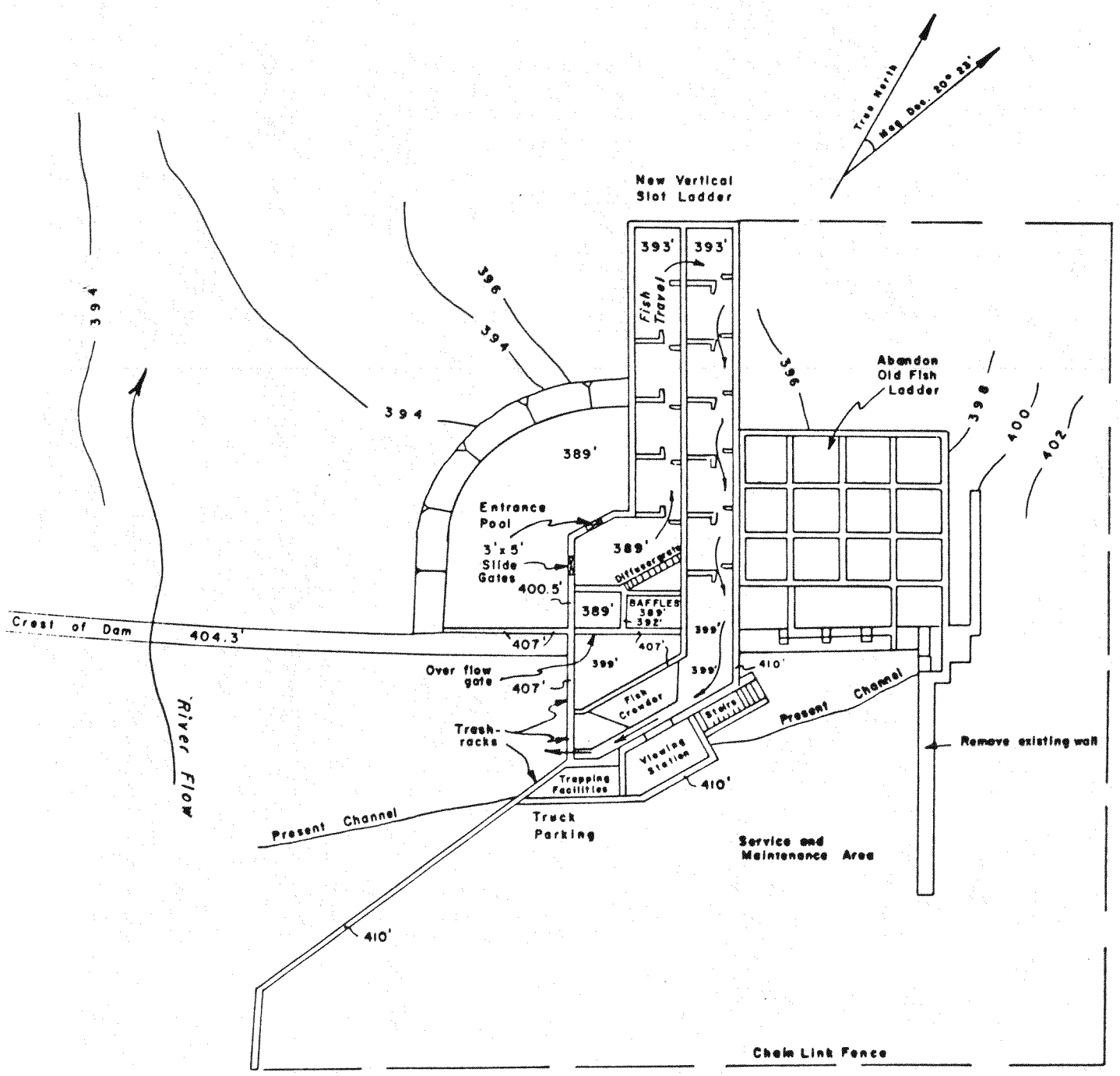


Figure 1

Umatilla Project - Oregon

THREE MILE FALLS DIVERSION DAM

FISH PASSAGE & PROTECTION FACILITIES RIGHT BANK FISH LADDER

10 0 10 20
SCALE IN FEET

U.S. Bureau of Reclamation | March 1985 | 30-100-5568

pool instead of being allowed to pass into the river. This would be done by controlling a set of hydraulically operated slide gates. Once in the holding pool the fish would be moved into a portable tank by a crowding mechanism. The tank would then be lifted from the holding pool by an elevator system and raised high enough to sluice the fish from the portable tank into fish transport trucks. Generally, the fish would be trapped and hauled to upstream spawning areas when instream flows above Three Mile Dam are too low for fish passage. Fish could also be hauled to hatchery facilities to be used for brood stock. The system is designed for flexibility, and the number of fish and frequency of hauling depends on the degree of success of the current efforts to reestablish chinook salmon runs.

Grating over the structures as well as chain link fence around the entire facility would be provided to prevent poaching and vandalism.

b. Left Bank Ladder Modifications.--The left bank ladder modifications would include a new entrance structure, improved auxiliary water supply, a viewing and counting station, a fish crowder, and a trapping and sampling facility. The vertical slot ladder itself would not be changed, since it meets current state-of-the-art design criteria.

In order to modify the existing fishway exit and entrance, the top of one of the arch buttresses would be removed. The old auxiliary water supply pipe and existing bypass pipe would be removed as well. Much of the existing entrance and exit would be renovated. Trashracks would be required across the exit to the fishway and the entrance to the auxiliary water supply. New trashracks would replace existing ones across the canal entrance (see figure 2).

The trapping and sampling facility would operate in a similar manner as the facility on the right bank ladder. However, tank trucks would not be able to park adjacent to the structure. Tank trucks would load from a location just downstream of the gatehouse, which avoids the use of the canal bridge. A long sluice system would be used to transfer fish from the elevated portable tank to the trucks.

Grating would be placed across open structures to prevent poaching. Access is limited to this side by existing locked gates on the canal access road, so additional chain link fence is not required.

Silt removal would be required to keep the fish ladder operational as well as debris removal from the exit, entrance, and immediate channels downstream.

c. WEID Canal Fish Screens.--A new fish screen structure would be located on the WEID canal just downstream of the existing gatehouse. The existing louver screens in the canal entrance would be removed since they would no longer be needed. The new facility would include seven rotary drum fish screens, each 10 feet in diameter and 12.5 feet long, oriented at an angle of 25° to the canal flows (see figure 3). The total length of the fish screen structure would be 110 feet. The screens would be designed to handle flows of 310 ft^3/s (which is the design capacity of the canal). Since actual usage averages only 210 ft^3/s during the peak month of the irrigation season and the existing capacity is only 270 ft^3/s due to settlement of the canal, a new lower design flow may be chosen before the final design stage.

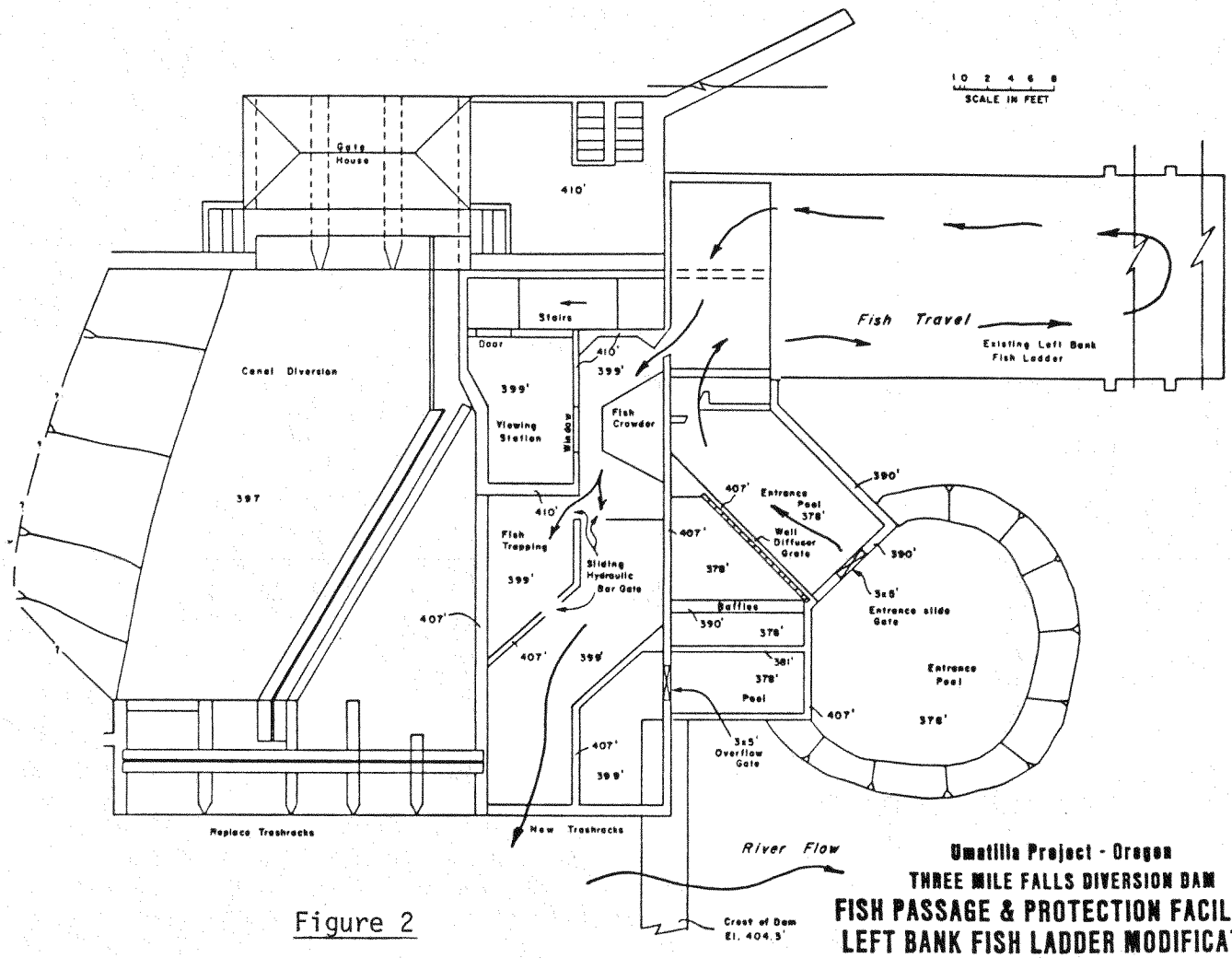


Figure 2

Umatilla Project - Oregon
THREE MILE FALLS DIVERSION DAM
FISH PASSAGE & PROTECTION FACILITIES
LEFT BANK FISH LADDER MODIFICATION

March 1985 30-100-5566

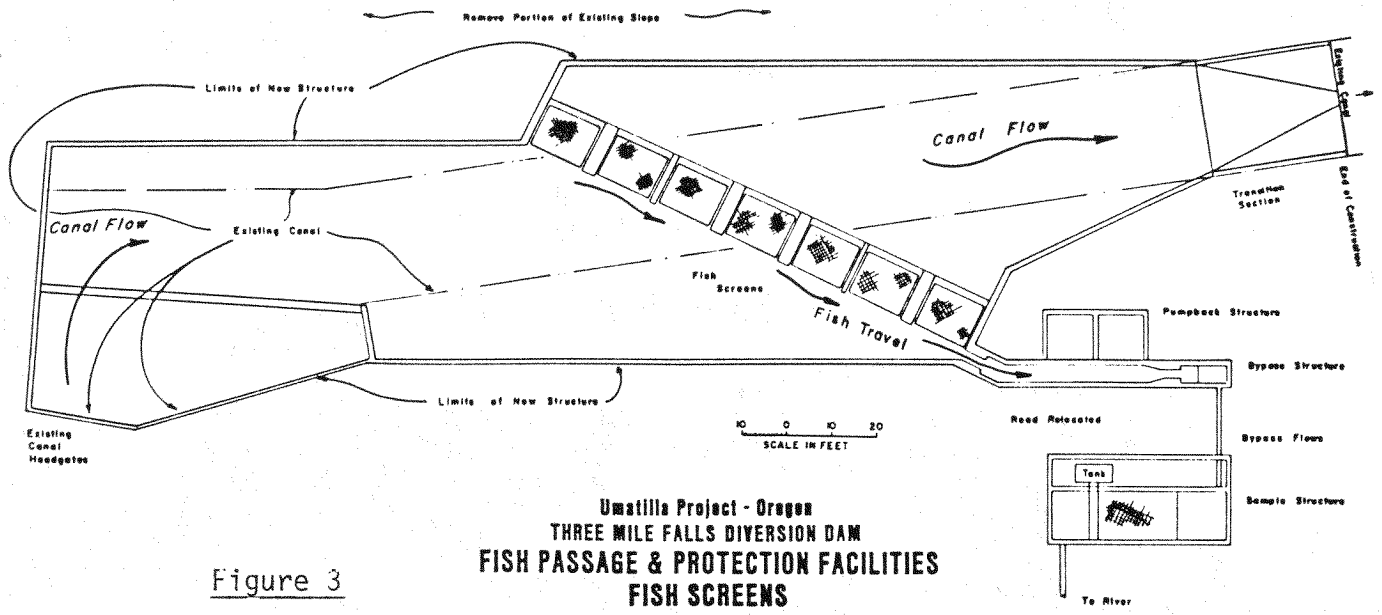


Figure 3

Umatilla Project - Oregon
THREE MILE FALLS DIVERSION DAM
FISH PASSAGE & PROTECTION FACILITIES
FISH SCREENS

March 1985 30-100-5567

The screening facilities would include a single entrance vertical slot bypass structure with a pump-back system to return a large portion of the bypass water back to the canal. This is needed especially during low flows to optimize water usage. A juvenile sampling structure would be located between the bypass structure and the Umatilla River.

d. Construction and Maintenance Access.--Access to both sides of the dam would be via existing roads. A paved highway passes by the right (east) side of the dam providing access for the right bank ladder. A dirt road along the WEID canal provides access for left (west) bank activities. The lands immediately surrounding Three Mile Falls Diversion Dam are under Reclamation withdrawal.

2. Operating Plan

The ideal operating flow for each ladder would be 85 ft^3/s. That condition would provide the desired fish attraction velocities through the entrance gate. This flow would be made up of 45-60 ft^3/s from the ladder (depending on flows over the crest), and the remaining flow from the auxiliary water supply system. The ladders would be designed to operate at flows up to 6,000 ft^3/s passing the dam. During low flows over the crest (when not enough water is available to operate two ladders satisfactorily), only the right bank ladder would be in operation. If no flows are going over the crest, then only the left bank ladder would be operational, provided there would be enough water to attract the fish and pass them up to the dam from downstream. Both ladders would successfully pass fish at flows of less than 85 ft^3/s.

The fish screen structure would handle 310 ft^3/s at velocities of 0.5 feet per second (ft^3/s); however, historical irrigation usage has been an average of 210 ft^3/s in any month. The bypass structure would take approximately 65 ft^3/s under normal conditions; however, the pump-back system would be capable of pumping 62 ft^3/s back into the canal if needed. Only 4 or 5 ft^3/s would be required to operate the sampling structure and to pass juveniles to the river. However, additional water from the dam or ladders would be needed to safely carry the juveniles downstream unless they were trapped and hauled by truck.

3. Costs

The construction costs for the new right bank ladder, the left bank ladder modifications, and the fish screen facilities are estimated to be $3,510,000. This includes $1,070,000 for the right bank fish ladder, $610,000 for the left bank ladder modifications, and $1,830,000 for the fish screen facilities.

Annual operation and maintenance costs would be $23,000 for the right bank ladder, $27,000 for the left bank ladder, and $22,000 for the fish screen facilities--a total of $72,000.

Construction and annual operation and maintenance costs are based on an October 1985 price level.

B. Concrete Apron Plus Left Bank Ladder

1. Description of Facilities

This alternative would consist of a training wall (barrier) and apron constructed downstream of the dam, modifications to the left bank ladder, and new screens and related structures in the WEID canal (see figure 4).

The barrier would consist of a 460-foot-long, 4-foot-high concrete wall with a 15-foot-wide concrete apron, constructed along the interface of the river channel and the overflow area downstream of the dam. The barrier would train upstream migrating adult fish toward the entrance to the fish ladder on the left bank and would prevent fish from reaching the east side of the dam where they are subject to injury, stranding, and poaching. The upstream area would be filled with rock and capped with concrete to eliminate fish resting areas and to reduce trash accumulation. In order for the barrier to function properly, the barrier, fill, and cut areas would have to be kept clear of debris.

The concrete barrier wall would be equipped with an aeration piping system. This would reduce the differential pressure created beneath the overflowing nappe. The fill area would have drain pipes to reduce uplift pressures and steel anchors to reduce erosion of the fill rock.

The left bank ladder modifications and the fish screen structures would be the same as described under the two-ladder alternative.

2. Operating Plan

The barrier and apron would operate effectively under a range of flow conditions. However, the structure was designed such that velocities on the apron would be about 16 ft^3/s at a flow of 3,000 ft^3/s. This velocity would make it difficult for fish to get on the apron. Those fish that did get on the apron would have to continue to swim against the high velocity to the upstream end of the apron. Here they would find it difficult to jump the 4-foot-high wall since flow depth on the apron would be too shallow for them to obtain vertical acceleration. At any time, if a fish would turn broadside to the flow, it would be swept off the apron. Any fish managing to pass the barrier would eventually be swept back into the main river channel since the area between the barrier and the toe of the dam would be filled to eliminate holes and pools where a fish could rest.

Only the left bank ladder would be operational under this scenario. The operation of the left bank ladder and fish screens would be the same as described under the two-ladder alternative.

3. Costs

The construction costs for the fish barrier and apron, the left bank ladder modifications, and the fish screen facilities are estimated to be $3,600,000. This includes $1,160,000 for the barrier and apron, $610,000 for the left bank modifications, and $1,830,000 for the fish screen facilities.

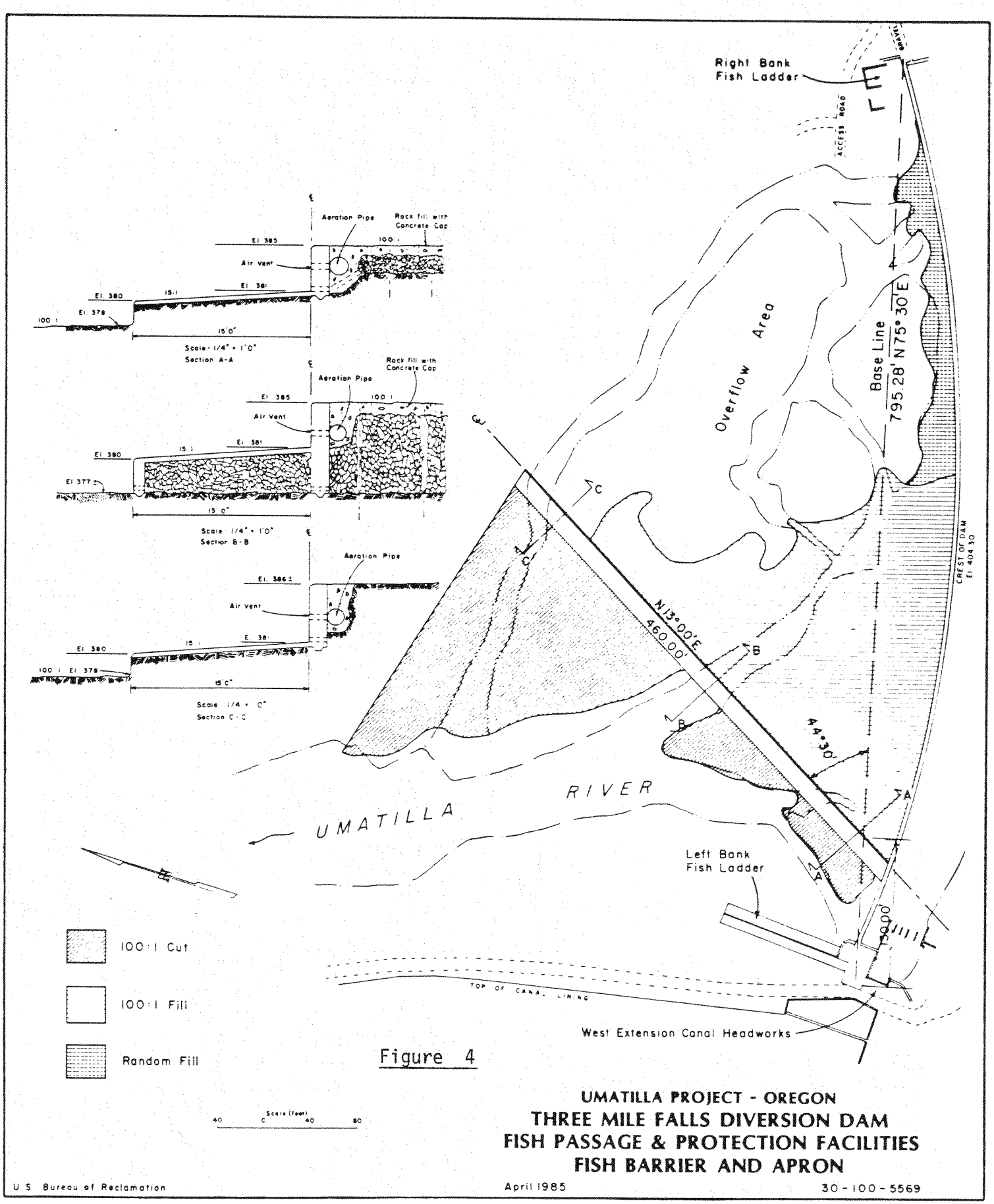


Figure 4

UMATILLA PROJECT - OREGON
THREE MILE FALLS DIVERSION DAM
FISH PASSAGE & PROTECTION FACILITIES
FISH BARRIER AND APRON

U.S. Bureau of Reclamation April 1985 30-100-5569

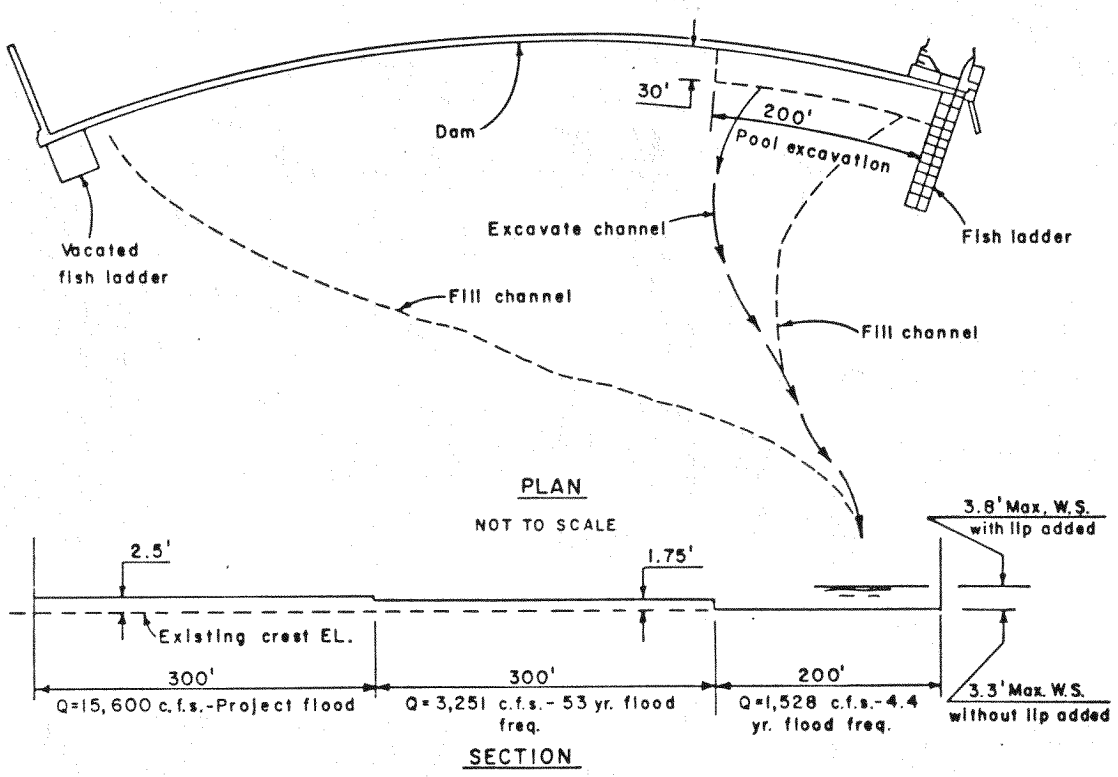
Annual operation and maintenance costs would be $8,000 for the barrier and apron, $27,000 for the left bank ladder, and $22,000 for the fish screen facilities--a total of $57,000.

Construction and annual operation and maintenance costs are based on an October 1985 price level.

C. Cap-on-Crest Plus Left Bank Ladder

1. Description of Facilities

A cap on the east and center portions of the dam would be the key features in this alternative. Other features would include modifications to the left bank ladder and new fish screens and related structures in the WEID Canal (see figure 5).



Umatilla Project - Oregon
THREE MILE FALLS DIVERSION DAM
FISH PASSAGE & PROTECTION FACILITIES

CAP ON CREST

April 1985 30-100-5570

Figure 5

A 2.5-foot-high cap would be constructed on the dam crest for a 300-foot length starting from the east (right) side. A center section would have a 1.75-foot cap for another 300 feet. The west 200 feet of the dam would be left without a cap. During low flow conditions (generally from July through February), fish attraction waters would be directed to the left bank fish ladder. Water cresting the dam would spill into an entrance pool which would be constructed along the face of the dam for the entire 200 feet of the uncapped section. A new channel would be constructed from the east end of the pool. Old channels would be filled in and capped with concrete to prevent stranding and delaying of upstream migrants.

Debris removal from the dam crest, left bank fish ladder entrance and exit, and the canal entrance would be essential for proper operation of all facilities. Also, this alternative would result in an approximate one-half foot increase in the maximum pool elevation behind the dam. Flood routing studies would be required to determine whether the WEID canal headworks and the left fish ladder exit would need to be raised. Core samples of the dam would be necessary to determine if the cap proposed in this alternative would require additional structural support for the dam.

The operation of the left bank ladder and fish screens would be the same as described under the two-ladder alternative. The existing right bank pool-and-weir ladder would be inoperable under this alternative.

2. Operating Plan

With the cap on the crest, flows would be directed to the west portion of the dam during low flow conditions. The noncapped section of the dam would be able to handle flows up to 1,528 ft^3/s, and with the middle section flows could increase to 3,251 ft^3/s. Above 3,251 ft^3/s flows would start cresting the east-capped section of the dam as well. At 15,600 ft^3/s, the cap would raise the water surface behind the dam by 0.5 feet over current conditions.

The left bank fish ladder and bypass structures would require up to 85 ft^3/s and 65 ft^3/s, respectively, as described under the two-ladder alternative.

3. Costs

The construction cost for the cap-on-crest, the left bank fish ladder modifications, and the fish screen facilities are estimated to be $3,020,000. This includes $580,000 for the cap on the dam, $610,000 for the left bank modifications, and $1,830,000 for the fish screen facilities.

Annual operation and maintenance costs would be $11,000 for the cap-on-crest, $27,000 for the left bank ladder, and $22,000 for the fish screen facilities--a total of $60,000.

Construction and annual operation and maintenance costs are based on an October 1985 price level.

D. Dam Removal

1. Description of Facilities

This alternative would require the construction of a new pumping plant at the mouth of the Umatilla River to supply water to the WEID Canal. Fish passage in the river would be improved by restoring the river channel to predam conditions. This would require the removal of a portion of the dam and bedrock and/or silt removal behind the dam. No fish ladders would be required, and the canal headworks would be abandoned. Water normally diverted at the dam for irrigation would be allowed to pass downstream for improved fish flows, particularly during low flow conditions and high fish migration. Water for the WEID Canal would be supplied by the pumping plant.

A new pumping plant would be constructed near the mouth of the Umatilla River at the present pumping site. Existing features are obsolete and would be entirely replaced. The new plant would have a capacity of 6,500 horsepower and would be able to lift 270 ft^3/s (present canal capacity) 150 feet to the existing canal structure. The forebay channel would need to be deepened, discharge lines replaced, and a new outlet structure built.

Approximately one-third of the dam would have to be removed to restore the channel to predam conditions. The other portions of the dam and related structures would be left in place and abandoned. Some of the silt behind the reservoir would be removed to prevent environmental problems downstream. The quantity of silt that would be removed and the amount left to flush downstream are not known at this time.

2. Operating Plan

WEID would obtain all its water supply from pumping from the mouth of the Umatilla River. A portion of this supply would have to be pumped back toward Three Mile Falls Diversion Dam. However, most of the needs are downstream from this point. The maximum capacity of the pumping plant is 270 ft^3/s, which is more than current supply (however, less than existing water rights).

Water normally diverted for irrigation at Three Mile Falls Diversion Dam would be allowed to pass downstream to improve fish passage flows in the river.

3. Costs

The construction costs for the pumping plant and dam removal are estimated to be $8,360,000. This includes $7,980,000 for the pumping plant and related structures and $380,000 for removal of a portion of Three Mile Falls Diversion Dam. This includes a limited amount of silt removal.

Annual operation and maintenance costs were not calculated for this alternative. Construction costs are based on an October 1985 price level.

A comparative summary of the action alternatives is found in table 1.

Table 1.--Comparative Summary of Plans

Item	Two Fish Ladders	Concrete Apron Plus West Ladder	Cap-on-crest Plus West Ladder	Dam Removal
Advantages	Technology proven on ladder design Reduces stranding of fish Offers most versatility for operation, trapping, and counting Improved attraction water to both ladders Improved passage to and through left bank ladder Canal screens included	Facilitates debris removal from face of dam Would only require operation and maintenance on one ladder Addition of counting/trapping facilities in right bank ladder Canal screens included	Least costly alternative Would only require operation and maintenance on one ladder Improved attraction to right bank ladder Addition of counting/trapping facilities in right bank ladder Canal screens included	Would provide most natural conditions for fish passage which would cause, least stress on fish (assuming adequate flows in river and channelization in reservoir area if needed)
Disadvantages	High operation and maintenance (debris and silt) potential on left bank ladder	Hydraulics of barrier unknown without model testing Debris or unfavorable hydraulics may create pockets of false attraction flows, resulting in adult migration delay	Potential for excessive debris problem at canal headworks Possible safety of dams problem Canal headworks would need to be raised due to raise in maximum reservoir water surface	Most expensive alternative Pumping costs may increase in future Loss of trapping/counting opportunities at Three Mile Falls Diversion Dam Environmental impacts more severe than other alternatives
Total construction costs	$3,510,000	$3,600,000	$3,020,000	$8,360,000
Operation, maintenance, replacement, and power costs	$72,000	$57,000	$60,000	Not calculated

E. No Action

If passage improvement measures are not implemented at Three Mile Falls Diversion Dam, the existing passage facilities would be operated and maintained as they are now. The low passage efficiencies for both upstream migrating adults and downstream migrating juveniles would remain the same. The louvers in front of the WEID canal entrance would be ineffective in screening juvenile salmon, which are much smaller than the steelhead smolts the louvers were designed for. Efforts by the CTUIR and ODFW to enhance steelhead runs and reintroduce chinook runs would be made much more difficult under this option.

F. Other Plans Considered

Three other alternatives were considered in the earlier stages of this study but were eliminated for various reasons. These alternatives were: (1) right bank ladder only, (2) ladder at new location (i.e., middle of dam), and (3) center cap-on-crest with sill-type ladder on east side. The right bank ladder only alternative was eliminated because it would abandon the best (left bank) existing ladder, and it was thought that a single ladder was not sufficient to meet fish passage problems. The middle ladder alternative was eliminated because of access and maintenance difficulties, particularly when trapping and counting fish. A middle ladder would require more water to

operate and would be more costly than a bank ladder due to additional heights and strength requirements. The sill-type ladder was omitted because it is more difficult to regulate flow, debris in the ladder would be a major problem, and trapping and sampling facilities would not be available.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides consideration of those resources which would most likely be affected by completion of the proposed activities. The resource areas listed immediately below are not measurably affected and are provided to note that they were considered in the process of preparing this assessment.

Recreation Resources: There are no Wild and Scenic Rivers, National Trails, or designated or proposed wilderness areas in the immediate project vicinity.

Land Use: The various alternatives would not change the existing land use, which is diversion of water for agricultural purposes. The proposed project would be consistent with existing State and local land use plans and has been coordinated with Federal, State, and local governmental agencies and interested parties. No farmlands will be converted to other uses or be indirectly affected by the various alternatives.

Solid or Hazardous Wastes: None of the alternatives involve the treatment, storage, or disposal of solid or hazardous wastes or pesticides.

Flood Plains/Wetlands: Due to the nature of the proposed activity, there are no practicable alternatives to modify the existing dam and fish passage facilities in the flood plain. The project would be consistent with the policies set forth in Executive Order 11988--Floodplain Management (May 24, 1977) all facilities proposed for construction in the flood plain would be designed to withstand flooding; none of the projects would involve an adverse impact of floods on human safety, health, or welfare because they would not diminish channel discharge capacity; and the program would restore and enhance the natural and beneficial values of flood plains by restoring and enhancing a component of the flood plain ecosystem--the fish population.

The proposed program would also be consistent with Executive Order 11990--Protection of Wetlands (May 24, 1977). The construction site presently has only minimal vegetation due to activities associated with the existing diversions. Care would be taken during construction activity to minimize the destruction of riparian vegetation. Also, any disturbed areas not needed for permanent facilities would be landscaped and revegetated as soon as possible after construction is completed. As with flood plains, the proposed program would restore and enhance a beneficial component of the riparian wetland ecosystem by restoring and enhancing the fish population.

A. Fishery Resources

1. Affected Environment

a. Summer Steelhead.--Summer steelhead is the primary anadromous fish species in the basin. Annual run sizes past Three Mile Falls Diversion Dam have fluctuated widely from 700 to 2,500, with a 14-year average of 1,880 returning adult spawners.

Adult steelhead use the lower main stem Umatilla River primarily as a migration corridor to headwater areas. Adult steelhead begin migrating upstream in October or November depending on flow conditions, and peak

migration occurs between November and March. Most steelhead spawn in Umatilla River tributaries in April and May.

The steelhead run has declined in recent years. In the last 3 years of record, an average of 1,122 fish have migrated to spawning beds in the upper basin. This compares to an average of 1,880 fish during the 14 years of count. Fishery biologists estimate the present steelhead escapement (adult fish that survive to spawn) in the entire Umatilla River drainage at about 1,000 naturally spawning fish.

Marginal survival of juveniles is probably the main factor limiting the basin's steelhead population. To compensate for poor juvenile survival, the State has been releasing hatchery-reared smolts into the river since 1981. It is hoped that this program will ultimately result in an additional 1,000 to 1,500 adult steelhead returning to the basin each year.

Egg incubation from naturally spawning fish occurs in the basin from April through July. Most rearing takes place in the same tributary streams where spawning was completed, and juveniles typically spend 2 years rearing in freshwater before migrating to the Pacific Ocean as smolts. An estimated 50,000-100,000 native smolts migrate from the basin annually and return as adults after an average of 2 years in the ocean.

Steelhead sport fishing provides an important recreational activity, with most activity downstream of Three Mile Falls Diversion Dam. Records indicate that an average of over 700 fish are harvested each year.

b. Fall Chinook.--A self-sustaining run of fall chinook has not existed in the system since shortly after the construction of Three Mile Falls Diversion Dam. However, an abundance of potential fall chinook habitat exists in the Umatilla system above the dam.

The Umatilla Basin Implementation Plan cites long-term escapement goals of 10,000 hatchery-produced and 11,097 naturally produced fall chinook salmon. Approximately 225,000 yearlings are programmed for acclimation and release at the Bonifer and Minthorn facilities through 1987. Based upon the results of ongoing studies at Bonneville hatchery, the most cost-effective program for juvenile releases will be used. This may include yearling releases, fall reared smolts, or fingerlings. Based upon available data, a return of 1,125 fall chinook is anticipated from this release, assuming a 0.5 percent smolt-adult survival. Returning adult fall chinook will be used as brood stock for hatchery production and to foster natural production in the system.

c. Spring Chinook.--Potential spring chinook spawning habitat exists in the upper main stem, lower North Fork, and South Fork Umatilla River and in Meacham Creek. The CTUIR and ODFW have plans for reestablishment of spring chinook in the Umatilla basin. Escapement goals are 10,000 hatchery-produced fish and 582 naturally produced fish. However, poor spring passage conditions and lack of deep holding pools for adults could limit the production of these fish. To avoid or reduce potential passage problems, brood stock would be selected for early arrival of adults to avoid low stream flows. When introduced, adults would enter the Umatilla River in April and may and migrate to upstream resting pools near spawning grounds. Adults would hold over in these pools until spawning commenced in late August and September. Most

juveniles would rear for a year prior to migration in April, May, and June. Holding pools are proposed in the Umatilla rehabilitation plan.

2. Environmental Consequences

a. Alternative A--PROPOSED ACTION.--Provision of adequate upstream adult fish passage and protection of downstream juvenile migrants would enhance summer steelhead and fall and spring chinook salmon in the Umatilla River basin. The following table summarizes assumed passage conditions at Three Mile Falls Diversion Dam with improved passage (5).

Table 2.--Assumed Passage Conditions (Expressed as Percentage of Fish Passing), Three Mile Falls Diversion Dam

Passage Conditions	No Action	Two Ladders Plus Screens in WEID Canal
Without flow enhancement		
Steelhead		
Adults	75	95
Juveniles	75	90
Fall chinook		
Adults	38	45
Juveniles	50	90
Spring chinook		
Adults	48	60
Juveniles	60	90
With flow enhancement 1/		
Steelhead		
Adults	80	95
Juveniles	75	95
Fall chinook		
Adults	90	95
Juveniles	50	95
Spring chinook		
Adults	80	95
Juveniles	75	95

1/ A flow enhancement project is currently under study by the Bureau of Reclamation and is described in reference 4.

The ODFW (6) estimated numbers of returning adults under a variety of scenarios. Under existing conditions, they anticipate average runs of 714 steelhead, 7 fall chinook, and 41 spring chinook. Under existing flow conditions, they anticipate ultimate returns of 2,894 summer steelhead, 3,905 fall chinook, and 551 spring chinook if upstream and downstream passage improvements are made at all diversion structures on the Umatilla River under existing flow conditions and habitat improvements are completed in Meacham Creek. Under this scenario, it is assumed that fish would be trapped at Three Mile Falls Diversion Dam and trucked to spawning areas, and smolts would be trapped and trucked downstream during periods of low flow.

Provision of adequate fish passage over Three Mile Falls Diversion Dam is a key step in rehabilitating anadromous fish runs in the Umatilla basin. Even if no other measures are taken to improve habit conditions or passage upstream in the basin, the fishery management agencies would be able to pass adult fish over the dam during adequate flow periods and trap and haul adults to suitable spawning sites or hatcheries when flows were too low. Similarly, downstream migrants would be adequately protected by screening of the WEID canal and could be trapped and hauled, if necessary.

The proposed fish passage improvements would have effects on anadromous and resident fish populations, which viewed in the context of the Umatilla River basin, would be very beneficial. The primary purpose of projects included in the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program was to achieve such beneficial effects. However, the Fish and Wildlife Program includes a number of other problem areas (e.g., artificial production, flows, etc.) and a number of other projects within the natural propagation activity. In the regional context, in which the proposed passage improvements program would be implemented, the effect of the proposed program would be small relative to the overall effect of implementing the entire Columbia River Basin Fish and Wildlife Program. Beneficial and adverse effects of those other activities and projects will be addressed in their own environmental review documents as independent parts of the overall Fish and Wildlife Program.

b. Alternatives B and C.--Both alternatives would be expected to potentially provide the same passage efficiency for both upstream migrating adults and downstream migrating juveniles as the Recommended Plan.

c. Alternative D.--Upstream adult migration efficiency would be increased under this alternative as shown in the following table (5).

Table 3.--Assumed Passage Conditions (Expressed as Percentage of Fish Passing), Three Mile Falls Diversion Dam

Passage Conditions		Dam Removal
Without flow enhancement		
Steelhead:	Adults	95
	Juveniles	95
Fall chinook:	Adults	50
	Juveniles	95
Spring chinook:	Adults	65
	Juveniles	95
With flow enhancement		
Steelhead:	Adults	100
	Juveniles	100
Fall chinook:	Adults	100
	Juveniles	100
Spring chinook:	Adults	100
	Juveniles	100

d. No Action.--The problems associated with fish passage at Three Mile Falls Diversion Dam would be magnified in the future under the no action alternative because of an aggressive salmon and steelhead restoration program within the Umatilla basin. There would be a diminished ability for the CTUIR and ODFW to meet salmon and steelhead production goals, and anadromous fish benefits anticipated from other rehabilitation efforts would be reduced. The options for achieving compliance with Federal treaty obligations in a manner mutually acceptable to the Confederated Tribes and to non-Indian users of basin resources would also be severely limited. Because of the number of fishery improvement proposals for the basin, it is not possible to accurately predict future anadromous fishery conditions. Table 4 lists those measures which have been set forth in the ODFW fishery rehabilitation plan (6) for the Umatilla basin.

Table 4.--Umatilla River Fishery Rehabilitation Plan (Fiscal Year 1986-90)--Priorities and Schedules For Implementation ((+)Investigations, (0)Construction Starts)

FW Program Reference	Project	Five-Year Schedule Fiscal Year 1986	1987	1988	1989	1990
	Fishery Rehabilitation Projects					
704(i)(1)	1. Hatchery facility for 200K summer steelhead	+	0			
704(g)(2)	2. Spring chinook reintroduction and broodstock development	+	0			
704(d)(1) Table 2	3. Three Mile Falls upstream and downstream passage improvement	+	0			
	4. Adult and smolt trapping/trucking program	+	0			
	5. Westland upstream and downstream passage improvement and smolt trapping facility	+	+	0		
	6. Cold Springs upstream and downstream passage improvement			+	0	
	7. Maxwell and Stanfield upstream and downstream passage improvement				+	0
	8. Small diversions downstream passage improvement					
	a. Brownell and Dillon	+	0			
	b. Umatilla River unscreened diversions (5)		+	0		
	c. Birch Creek unscreened diversions (11)			+	0	
	9. Habitat improvement					
	a. Meacham and North Fork Meacham Creeks	+	+	0		
	b. South Fork Umatilla River Thomas Creek	+	+	0		
	c. Mainstem Umatilla River (Meacham Creek to Forks)	+	+	+	0	
	d. North Fork Umatilla River			+	0	
	e. Squaw Creek			+	0	
	f. Birch and East and West Fork Birch Creeks			+	+	0
	Flow Enhancement Projects					
704(d)(2)	1. McKay Storage Plan	0				
	2. Bureau of Reclamation's CRP or CRP/Meacham Dam Plans	+	+	+	+	0

B. Water Supply and Quality

1. Affected Environment

Water quality of the Umatilla River is adequate for most uses. In the Blue Mountains headwaters the water is cool, clear, low in pollutants, and high in dissolved oxygen. After it flows past Pendleton and through dryland and irrigated agricultural areas to the Columbia River, its character is degraded as a result of waste discharges and land management practices. The water carries heavy sediment loads at times, has high bacterial levels, lowered dissolved oxygen levels, and some algal growths in the main stem river from Pendleton downstream.

As a relatively shallow, fast moving stream, the Umatilla has a large capacity for accepting atmospheric oxygen. In the past, waste loads have not driven oxygen levels down excessively, with measured dissolved oxygen levels consistently exceeding 8 milligrams per liter (mg/l). Several measurements in the lower reaches show significant supersaturated levels, indicating considerable algal activity in the summer and fall months.

The stream temperatures usually reach their highest levels in July and August. In the upper reaches above Meacham Creek, maximum temperatures of 74 °F have been recorded during August. The average August maximum temperature is around 69 °F. Downstream near Umatilla, stream temperatures are substantially higher, with 85 °F the highest recorded measurement. August temperatures normally range in the middle 70's. Small irrigation diversion dams in the lower Umatilla River cause water to build up behind them, and this results in an increase in water temperature. These dams also check the flow of sediment to the Columbia River.

Concentrations of nitrates (NO_3 - N) and phosphates (PO_4) have been quite high. Above Pendleton, average measurements by the Department of Environmental Quality have been about one-third of those below Pendleton, indicating that the Pendleton waste load is a major source of nutrients.

Pendleton waste effluent and the cattle feedlots at Rieth exert the primary effect upon bacteriological quality. Above Pendleton, coliform bacteria levels are generally below 1,000 most probable number (MPN) per 100 milliliter (ml). The median measurement has been 230 MPN per 100 ml. Below Pendleton, measurements are normally above 6,000, with a median of 7,000 MPN per 100 ml. By the time the river reaches Umatilla, recorded levels have decreased to the range of 45 to 7,000, with a median of 700 MPN per 100 ml.

The Umatilla River and its tributaries normally yield large amounts of sediments. Peak levels occur during periods of high streamflows caused by rainstorms or rapid snowmelt. Most of the sediment is derived from the agricultural lands below the mouth of Meacham Creek. These lands alternate annually between wheat and fallow fields. Less than 20 percent of the fallow fields are kept in stubble mulch, the remainder being barren and particularly susceptible to erosion forces.

The Umatilla River generally has low flows from July through February and moderate to high flows during March through June. Diversions are high during

the irrigation season and result in low streamflow in the river's lower reaches. Table 5 summarizes monthly flows in ft^3/s for 44 years of record (1935-78).

Table 5.--Monthly Flows in the Umatilla River for 44 Years of Record (1935-78)

Month	Umatilla River below Three Mile Falls Diversion Dam	West Extension Canal
	ft^3/s	ft^3/s
October	70	91
November	224	5
December	552	0
January	693	0
February	845	0
March	954	45
April	1,095	156
May	548	168
June	108	164
July	23	166
August	26	169
September	34	145

2. Environmental Consequences

a. Alternative A.--Construction of the new right bank ladder and channel modifications below Three Mile Falls Diversion Dam would result in minor, short-term turbidity in the Umatilla River below Three Mile Falls Diversion Dam. Since the area below the dam is bedrock, the amount of turbidity generated by channel work should be quite low. Construction of the retaining wall and the fish viewing and trapping facilities would necessitate the removal of sediment along the right bank immediately behind the dam. Cofferdams would be built on the upstream side of the dam to dewater the two ladder construction sites. These activities would be scheduled to occur during low flow periods (mid-to-late summer), so downstream turbidity, if any, would be of short duration and minimal impact.

Sediment deposition in the canal immediately above the new WEID screens could create a major maintenance problem, the degree of which is unknown at this time. This sediment would have to be removed at least once annually.

Both of the new screens are designed to operate at 85 ft^3/s. However, they would efficiently pass fish at much lower flows. During periods of extreme low flow, one ladder would be shut down and all fish would pass through one ladder.

The bypass structure at the WEID Canal screens would require 65 ft^3/s to operate. However, the pumpback system is capable of pumping 62 ft^3/s back

into the canal if needed. Only 4-5 ft^3/s would be required to operate the fish sampling structure and to pass juveniles to the river. However, additional water in the river channel would be necessary to transport the juveniles downstream.

This plan would have no effect on overall water quantity in the Umatilla River above or below Three Mile Falls Diversion Dam. There would be no effect on drinking water.

b. Alternative B and C.--Construction of either of these alternatives would result in minor, short-term impacts to water quality below the dam. Construction of the concrete apron would require some blasting and other work in the channel area immediately below the dam. However, since this area is almost entirely bedrock, the contribution of sediment into the river channel would be minimal. Construction of the cap-on-crest alternative would result in little or no impact to water quality.

The impacts associated with operation of the WEID Canal screens would be identical to those described under Alternative A.

c. Alternative D.--The pool behind Three Mile Falls Diversion Dam is filled with sediment, the quantity of which is unknown. Removal of a portion of the dam would result in a large quantity of sediment being flushed downstream for an unknown period of time. Even if a portion of the sediment is removed before dam removal, a large quantity would likely be transported downstream. Since the channel downstream of the dam contains no spawning habitat, the primary potential impact from this activity would be to fish passage.

Also, there is a potential for significant sediment deposition to occur at the mouth of the Umatilla River in Lake Umatilla. Since the new pumping plant included in this alternative is located in the same area, sediment removal would likely be needed at this location also.

This plan would have no effect on overall water quantity in the Umatilla River above or below Three Mile Falls Diversion Dam.

d. No Action.--Water quality conditions are not expected to change in the future. Future flows in the Umatilla River would remain essentially unchanged unless the Bureau of Reclamation's Umatilla Basin Project is constructed. The project would result in essentially higher late summer-early fall flows in the lower Umatilla River. A detailed discussion of this proposal is found in the Umatilla Basin Project Planning Report/Draft Environmental Statement (4).

C. Wildlife Resources

1. Affected Environment

Riparian vegetation along the lower Umatilla River consists primarily of cottonwood, Russian olive, willow, grasses, sedges, and cattail (7). This habitat supports a variety of wildlife species.

Several furbearers utilize this riparian habitat, including beaver, muskrat, mink, and raccoon. Common upland game species include ring-necked

pheasant, chukar, valley quail, and mourning dove. Big game is scarce, but a few mule deer utilize the riparian zone. Other mammals include coyotes, porcupines, rabbits, weasels, and a variety of rodents. Numerous species of songbirds, shorebirds, and raptors also utilize the area.

Waterfowl are abundant within the area. The lower Umatilla River is utilized as a winter resting area by mallards, American wigeon, pintail, and green-winged teal. Mallards and teal use the area for nesting. The U.S. Fish and Wildlife Service (FWS) estimates 20 nesting pairs of ducks use the lower 3 miles of the Umatilla River (7).

The bald eagle, listed as "threatened" within Oregon, is a fall migrant and winters within the Umatilla basin. According to FWS (8), "Mid-January surveys conducted since 1980 show the Umatilla basin supports no more than 12 bald eagles during any one year. This includes surveys conducted at Cold Springs National Wildlife Refuge and the adjacent banks of the Columbia River. A maximum of two bald eagles have been observed along the Umatilla River during these counts. Incidental sightings of one or two adult birds have been recorded during the fall season. No bald eagles nest in the Umatilla basin." (8) The U.S. Fish and Wildlife Service (FWS) has been consulted regarding potential effects of the proposed activities on the bald eagle (see appendix B).

2. Environmental Consequences

a. Alternatives A, B, and C.--During construction, disturbance to habitat along the right bank adjacent to Three Mile Falls Diversion Dam would be minor. The increased activity during the construction period would likely displace small numbers of wildlife. However, the short- and long-term impacts associated with this would be negligible.

There would be little or no change in flows in the Umatilla River flows with any of the alternatives. The cap-on-crest alternative would slightly raise the elevation of the pool behind Three Mile Falls Diversion Dam, but no changes in wildlife habitat composition or quantity are anticipated.

None of the alternatives would adversely affect the bald eagle nor modify any critical habitat as documented through consultation with the FWS on March 5, 1985. According to FWS, efforts to enhance anadromous fish runs in the Umatilla basin may promote the conservation of the species by providing a food source during the winter months (8). (Section 7 correspondence is appended to this report.)

b. Alternative D.--Under this plan, the pool behind the dam would be replaced by a free-flowing river. This would result in a gradual shifting of the riparian zone toward the river. However, no significant changes in species composition or quantity are anticipated.

Activities associated with dam removal would likely temporarily displace wildlife in the immediate vicinity of the dam. No long-term impacts are anticipated, however.

c. No Action.--No significant changes in wildlife habitat are anticipated to occur in the project area.

D. Social and Economic Factors

1. Affected Environment

The Umatilla Indian Reservation is located within the Umatilla River basin. One of the tribes' highest values is maintenance of their traditional culture. The complete loss of salmon runs and reduced steelhead runs have severely impacted the cultural ties of the Indians to the anadromous fish resource.

Salmon and steelhead runs within the Columbia Basin, regardless of their location, contribute to the commercial and sport fishery, ranging from the Columbia River to the Pacific Ocean as far north as Alaska and south to northern California.

2. Environmental Consequences

a. Alternatives A-D.--Provision of adequate fish passage and protective facilities at Three Mile Falls Diversion Dam would be a key component in the effort to rehabilitate salmon and steelhead runs in the basin. This would positively affect the cultural concerns of the Umatilla tribes and the anadromous fish-related economy of the Pacific Northwest.

b. No Action.--Pressure from the Umatilla Indians to improve fish passage at Three Mile Falls Diversion Dam would likely continue.

E. Energy Use

1. Affected Environment

The present operation of Three Mile Falls Diversion Dam requires very little electricity. All headgates and other features are operated manually.

2. Environmental Consequences

a. Alternative A.--Electricity would be required to operate the fish screens and pumpback facility associated with the screens. Operation of the screens would require an estimated 31,300 kilowatt-hours (kWh) per year while the pumpback would require 223,800 kWh per year.

Lighting for the fish ladder would require an estimated 3,000 kWh per year for each of the two ladders.

b. Alternatives B and C.--The same power requirements described under Alternative A for the fish screens, pumpback system, and left bank fish ladder would be needed for both the concrete apron and cap-on-crest alternatives. Since there would be no new right bank ladder under either of these alternatives, there would be no power needs.

c. Alternative D.--The pumping station that would replace Three Mile Falls Diversion Dam would use an estimated 8.5 million kWh per year.

Power requirements for each of the action alternatives are found in table 6.

d. No Action.--The present operation described under "Affected Environment" would remain the same.

Table 6.--Estimated Power Requirements for Alternative Action Plans, Three Mile Falls Diversion Dam, Oregon

	Annual Power Use in Kilowatt-hours				
	Fish Screens				Total Annual Energy Use
Alternative	Screens	Pumpback Facility	Fish Ladders	Pumping Station	
Alternative A (two fish ladders)	31,300	223,800	6,000	--	261,100
Alternative B (concrete apron plus West Ladder)	31,300	223,800	3,000	--	258,100
Alternative C (cap-on-crest plus West Ladder)	31,300	223,800	3,000	--	258,100
Alternative D (dam removal)	--	--	--	8,500,000	8,500,000

F. Air Quality

1. Affected Environment

Air quality in Oregon is monitored by the Oregon Department of Environmental Quality. The project area is located within the Eastern Oregon Air Quality Control Region. Both the Federal Government and the State of Oregon have developed standards for allowable levels of certain air pollutants. Air quality in the project area is considered good by the Department of Environmental Quality. As with most other areas in Oregon, State studies along with Federal guidelines place Umatilla County in an air quality status of class II PSD (prevention of significant deterioration). Class II areas allow for moderate degradation of air quality within controlled permit guidelines. Presently, air quality conditions are not a major constraint on development within the county (4).

There are occasional air quality problems in the Umatilla basin. Windblown dust particulates is a seasonal problem occurring during the warmer, dry months, spring through summer. Several times each year strong westerly winds or local thunderstorms can create duststorms, causing loss of topsoil in lower basin areas where fallow dryland wheatfields are located. The density of dust particulates during these high wind periods can disrupt vehicular traffic on highways and cause irritation and discomfort to individuals with respiratory conditions. Another problem is associated with occasional wintertime temperature inversions that prevent the normal dispersal of local pollutants. The recent popularity of home woodstove use has created an increasing winter problem of wood smoke pollution--particularly in the Pendleton area. This usually occurs in January and February, and when wood smoke is combined with inversion-trapped automobile hydrocarbon emissions, poor air quality prevails until winds develop to blow pollutants out (4).

2. Environmental Consequences

a. Alternatives A-D.--Construction activities associated with any of the alternatives would result in very minor, short-term, and localized increases in air pollution. This would occur as vehicle exhaust emission and particulate matter (dust). These activities would not cause any violation of the Federal and Oregon air quality standards for particulates of 60 micrograms per cubic meter (ug/m^3) or 150 ug/m^3 in a 24-hour period.

b. No Action.--It is anticipated that windblown dust particulates will be a continuing natural occurrence in the basin under dryland farming practices. Some deterioration of basin air quality conditions can be expected in the future as a result of population growth and related urban and suburban expansion. The 1980 Umatilla County population was about 59,000. Population estimates for the year 2000 range from about 74,300 to about 124,000.

G. Noise

1. Affected Environment

Ambient noise levels have not been measured in the vicinity of Three Mile Falls Diversion Dam. Primary sources of noise in the project area include vehicular traffic on the highway adjacent to the east side of the dam, water falling over the dam, and farm machinery on nearby farms.

2. Environmental Consequences

a. Alternatives A, B, and C.--Construction activities would generate temporary and short-term increases in noise levels in the project vicinity. Since there are no residences in the immediate project vicinity, this noise should cause no disturbance. Construction specifications would require contractors to comply with all Federal, State, and local regulations concerning the control of noise levels. This would include the proper installation and maintenance of muffling devices on equipment.

b. Alternative D.--Minor and temporary noise disruptions would occur during construction of the new pumping plant, located within the town of Umatilla. The site is among existing operating pumps and is near several residences. Construction noise could be a source of annoyance to some residents. This would be short term, and construction activities could be restricted to daytime work shifts to coincide with normal higher noise levels occurring then. The incremental increase in pump operation noise levels is unknown.

c. No Action.--Future noise levels are not expected to change significantly.

H. Cultural Resources

1. Affected Environment

"Cultural resource" refers to any building, site, district, structure, or object with historical, architectural, cultural, or scientific importance.

Federal legislation requires consideration of cultural resources during project planning. Cultural resources must be identified and evaluated to determine if they are listed in, or eligible for listing in, the National Register of Historic Places (National Register). Federal agencies must attempt to avoid impacts to National Register properties, or if adverse impacts are unavoidable, properly mitigate the impacts through scientific study, architectural recording, or some other appropriate treatment. The activities to be included in the proposed action and the action alternatives would be within a very confined area which contains no known cultural or historical sites. The State Historic Preservation Officer (SHPO) has been consulted and indicates that no sites are located in the affected area.

2. Environmental Consequences

An on-the-ground survey would be conducted prior to initiation of construction activities. The Advisory Council on Historic Preservation Regulations 36 CFR 800 would be followed if sites are found.

IV. CONSULTATION AND COORDINATION

A. Coordination with Others

The Bonneville Power Administration served as a cooperating agency in the environmental analysis of the alternatives and the preparation of the environmental assessment. The following organizations provided information or otherwise participated in the studies:

Confederated Tribes of the Umatilla Indian Reservation
Oregon Department of Fish and Wildlife
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Columbia River Intertribal Fish Commission
Bureau of Indian Affairs
Corps of Engineers
West Extension Irrigation District
Bonneville Power Administration

The biological assessment was prepared by an interagency team comprised of the FWS, National Marine Fisheries Service, ODFW, Confederated Tribes of the Umatilla Indian Reservation, and the Columbia River Intertribal Fish Commission. Designs for fish ladders and screens were developed by Reclamation in close consultation with the National Marine Fisheries Service and ODFW. The Bonneville Power Administration provided funding for the design work.

B. Literature Cited

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2. Oregon Department of Fish and Wildlife. January 1985. Umatilla Rehabilitation Plan Review (Draft).

3. Confederated Tribes of the Umatilla Indian Reservation. 1984. Umatilla River Basin Recommended Salmon and Steelhead Habitat Improvement Measures.

4. U.S. Department of the Interior, Bureau of Reclamation. 1985. Umatilla Basin Project, Oregon, Planning Report/Draft Environmental Statement.

5. U.S. Department of the Interior, U.S. Fish and Wildlife Service. 1984. Biological Assessment on Fish Passage Problems at Three Mile Falls Diversion Dam. 26 pages.

6. Oregon Department of Fish and Wildlife. 1985. Draft Umatilla Rehabilitation Plan. 59 pages.

7. U.S. Department of the Interior, U.S. Fish and Wildlife Service. 1984. Coordination Act Report, McNary Additional Purposes Project Study. 15 pages.

8. U.S. Department of the Interior, U.S. Fish and Wildlife Service. Memorandum to Bureau of Reclamation dated September 22, 1984. Subject: Umatilla Basin Project Formal Section 7 Consultation. 6 pages.

C. Mailing List

The environmental assessment has been mailed to the following organizations and individuals for their review and comment:

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July 6, 1984

Recipient:

This is the final biological assessment of anadromous fish passage problems at Three Mile Falls Diversion Dam, Umatilla River, Umatilla County, Oregon. The assessment describes: 1) existing and future anadromous fish resources of the Umatilla Basin; 2) current fish passage facilities and passage problems at Three Mile Dam; and, 3) eight alternative actions under two flow conditions (present and future). Future flow conditions are those that would exist with two potential flow enhancement projects--one by the Corps of Engineers and one by the Bureau of Reclamation. These projects are briefly described as they relate to flow conditions at Three Mile Dam.

The purpose of the assessment is to provide the biological aspects of fish passage problems under the above conditions. This information is being provided to the Bureau of Reclamation for its use in development of a structural feasibility/preliminary design study of passage problems and solutions at Three Mile Dam. The study will also include engineering and economic information and will be submitted to the Bonneville Power Administration for possible funding under the Northwest Power Planning and Conservation Act. The assessment is in outline form to assist the Bureau in preparation of its study.

Both written and/or verbal comments were received from the Oregon Department of Fish and Wildlife, National Marine Fisheries Service, Confederated Tribes of the Umatilla Indian Reservation, and the Bureau of Reclamation. The final assessment has been refined and updated as a result of internal review and comments on the draft assessment.

We look forward to your continued interest and cooperation in protecting and restoring anadromous fish resources in the Umatilla River Basin.

Sincerely,

Russell D. Peterson

Russell D. Peterson
Field Supervisor

BIOLOGICAL ASSESSMENT, FISH PASSAGE AT THREE MILE FALLS DIVERSION DAM, UMATILLA RIVER

I. Three Mile Falls Diversion Dam

A. Purpose and Function of Dam

Three Mile Falls Diversion Dam is located on the Umatilla River approximately 3 miles south of Umatilla, Oregon. The structure is a concrete buttress dam with a maximum height of 24 feet, hydraulic height of 23 feet, and a crest length of 915 feet. The dam was constructed by the U.S. Bureau of Reclamation (BR) in 1914 as an integral part of the Umatilla Project. It diverts water to the service area of the West Extension Irrigation District (WEID) through a 27-mile-long main canal. The canal headworks capacity is 375 cubic feet per second (cfs) and the canal capacity is 310 cfs. The historic peak diversion has been 305 cfs with maximum canal flows averaging about 210 cfs over the past 50 years. The diverted water is used to irrigate about 7,000 acres of farmland.

B. Ownership, Operation, and Maintenance Responsibility

The dam is owned by the BR with operation and maintenance responsibilities being handled by the WEID. Provisions for operation and maintenance are handled under contract between the two agencies.

C. Diversion Dam Design and Flow Characteristics

The dam was designed to function as an overflow weir along its entire crest. During the normal irrigation season (April through October) the WEID diverts available river water to meet their demand, and passes the remainder over the dam crest. During periods of low flow, all the available water is diverted (up to the canal capacity), except for about 15 to 20 cfs released through the downstream migrant bypass pipe for downstream diversion at the Brownell site. When river flow is inadequate to meet irrigation requirements, additional water can be pumped into the canal from the Columbia River. This has not been done in the last few years because of the pumping costs.

During the non-irrigation season, all river flow in excess of fish ladder and bypass pipe capacity is passed over the dam. As the flows increase over the dam, the proportion of total

flow at the ladder entrance decreases. Figure 1 depicts the average flow conditions in the Umatilla River below Three Mile Dam over the 44-year period, 1935 to 1978. The photo on page 4 shows the design and operation of the diversion dam, with flows overtopping the crest along most of its length.

D. Existing Fish Passage Facilities

1. West Ladder, Trap, and Counting Facilities

The West Ladder on the left abutment of the dam is a vertical-slot type structure which was completed in August, 1964. It has 21, 8 foot by 10 foot rectangular concrete pools. The floor slopes and the slots in the pools go clear to the floor. The ladder is operated during periods of upstream anadromous fish migrations and utilizes about 20 to 40 cfs for ladder operation, depending upon forebay depths. When there is a difference of 20 feet between the forebay and tailwater, the ladder will operate with about 1 foot difference in water level between pools. A 12-inch diameter pipe routes water from inside the upper pool through a diffuser in the lower pool to provide additional attraction flows (about 15 cfs) for adult anadromous fish.

The ladder is not designed for trapping, counting, and holding adult anadromous fish. An electronic counter operated at the head of the West Ladder for several years but has nott been used recently This counter was difficult to calibrate and gave inconsistent results. Consequently, a temporary conduit, fyke-type trap is used in the upper four pools of the ladder for annual counting of summer steelhead. The pools are then partially dewatered and the fish are individually dip-netted, counted, and passed over the dam. Steelhead broodstock selection (for the juvenile supplemental outplanting program) also occurs in this manner. Downstream juvenile migrants are passed either over the crest of the dam or through a bypass pipe that collects those fish which have been "screened" from the canal entrance. The bottom photo on page 5 shows the juvenile bypass pipe existing in the tailrace, and the West Ladder entrance.

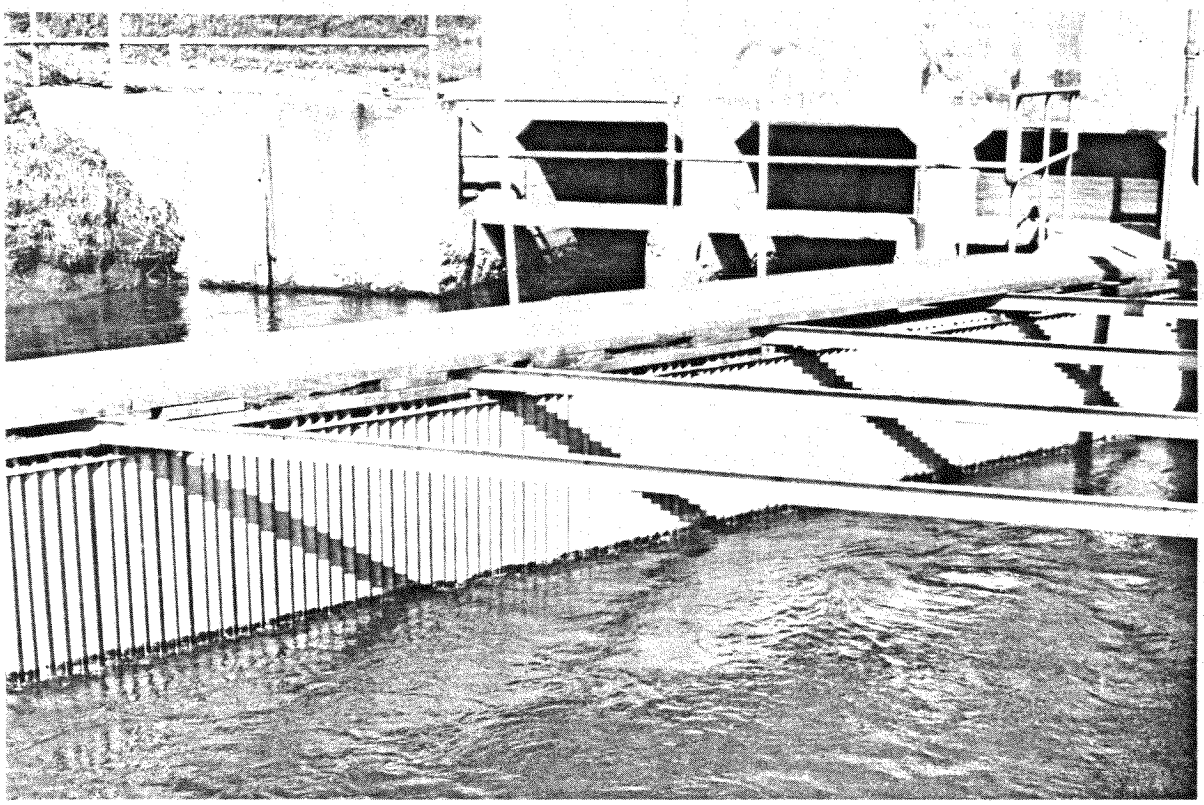
2. West Extension Irrigation District Louver

The louver is mounted at the intake of the WEID Canal at the west end of Three Mile Dam. It is approximately 30 feet long and consists of a series of fixed metal slats spaced about 1 to 2 inches apart. It prevents most steelhead smolts from entering the canal and directs them to the entrance of the bypass pipe. The top photo on page 5 shows the louver system.

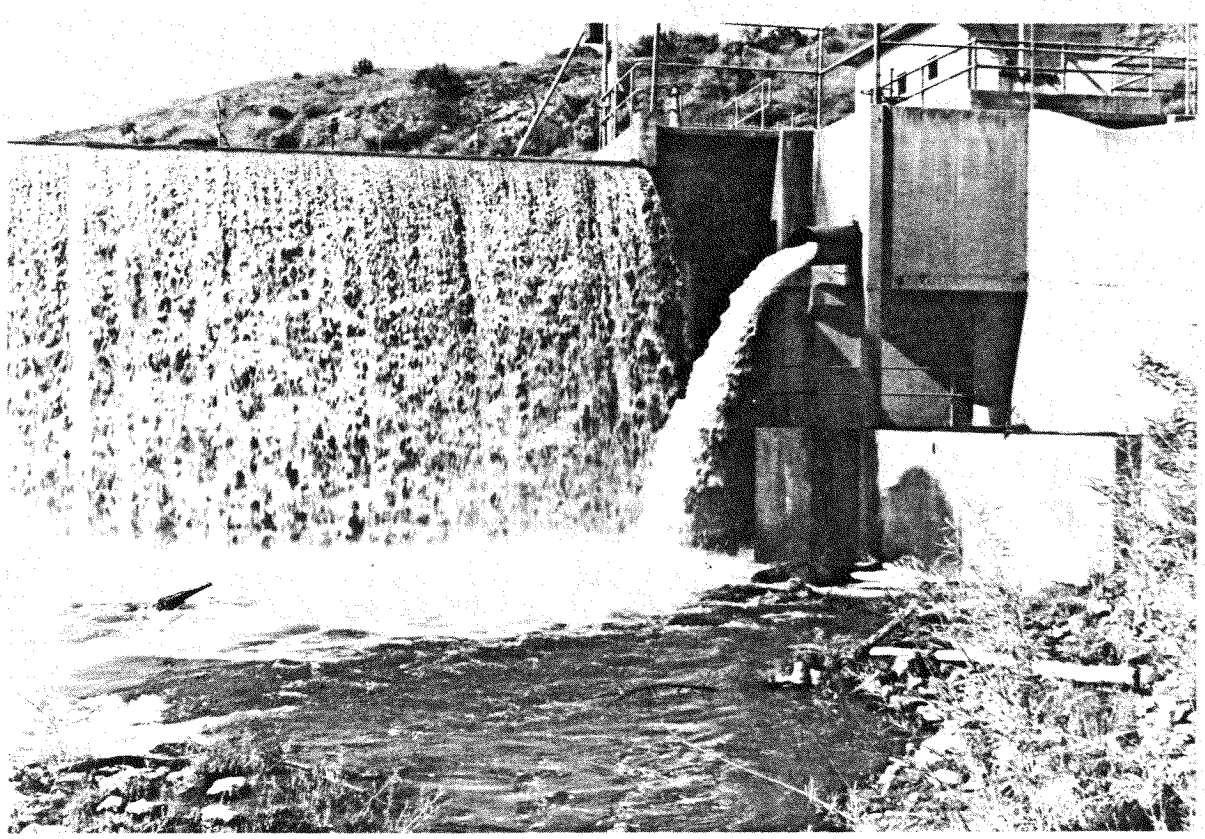
Figure 1. Average Monthly Flows Expressed in cfs Below Three Mile Dam for 44 Years of Record, 1935-1978

Year	Oct	Nov 15	Nov 30	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep 15	Sep 30	Average
1935	5.	5.	13.	390.	322.	316.	188.	974.	109.	11.	15.	14.	9.	18.	195.6
1936	4.	84.	106.	88.	365.	289.	1082.	1513.	176.	13.	12.	10.	8.	13.	303.8
1937	9.	31.	84.	79.	51.	198.	578.	1206.	375.	50.	10.	26.	48.	28.	222.2
1938	33.	110.	161.	291.	275.	393.	1041.	1181.	95.	29.	25.	15.	27.	13.	293.2
1939	16.	79.	137.	174.	168.	283.	1560.	692.	48.	18.	38.	14.	5.	21.	261.3
1940	17.	105.	100.	110.	105.	987.	1391.	774.	17.	15.	22.	13.	13.	16.	292.5
1941	13.	128.	268.	484.	319.	117.	321.	11.	36.	211.	15.	41.	49.	68.	152.7
1942	210.	250.	867.	733.	545.	892.	739.	992.	855.	445.	148.	28.	81.	35.	514.0
1943	14.	138.	356.	1280.	1273.	1663.	1181.	2023.	957.	295.	54.	63.	52.	51.	752.1
1944	98.	188.	115.	122.	95.	202.	743.	1037.	148.	26.	22.	21.	40.	14.	223.7
1945	80.	101.	138.	115.	332.	946.	1000.	1267.	855.	91.	26.	32.	58.	42.	405.4
1946	43.	135.	618.	803.	749.	488.	1457.	1409.	535.	99.	48.	45.	151.	97.	515.0
1947	130.	163.	637.	1571.	820.	779.	832.	588.	15.	66.	35.	24.	32.	51.	440.7
1948	76.	645.	1030.	974.	888.	1066.	991.	2120.	3360.	551.	41.	56.	141.	77.	921.6
1949	138.	128.	217.	450.	226.	1584.	1963.	1872.	652.	31.	19.	35.	31.	43.	590.9
1950	44.	113.	157.	171.	521.	1462.	1490.	1363.	797.	804.	11.	51.	65.	45.	568.0
1951	140.	358.	325.	795.	1207.	1815.	1429.	1054.	217.	140.	32.	21.	33.	19.	593.7
1952	171.	181.	258.	344.	371.	882.	829.	1501.	430.	22.	26.	19.	37.	25.	399.6
1953	36.	72.	128.	117.	1007.	1369.	1123.	1481.	726.	417.	26.	68.	80.	71.	538.8
1954	92.	129.	167.	562.	436.	689.	456.	560.	13.	220.	24.	35.	46.	67.	271.1
1955	40.	207.	126.	131.	132.	189.	122.	737.	1478.	116.	27.	45.	52.	34.	269.6
1956	39.	184.	536.	1215.	1309.	742.	1703.	1376.	1107.	44.	14.	44.	28.	19.	666.4
1957	69.	221.	165.	583.	116.	833.	1499.	1407.	914.	39.	12.	36.	24.	12.	474.4
1958	161.	176.	210.	635.	715.	1875.	688.	3055.	980.	11.	8.	45.	47.	11.	688.6
1959	51.	262.	362.	948.	1378.	910.	894.	981.	318.	35.	19.	25.	111.	123.	497.1
1960	311.	192.	567.	160.	306.	587.	1132.	640.	726.	34.	17.	66.	65.	26.	366.2
1961	14.	152.	629.	215.	205.	1477.	1338.	405.	218.	24.	12.	25.	46.	17.	355.4
1962	15.	118.	176.	274.	513.	298.	699.	891.	441.	33.	19.	10.	27.	17.	280.1
1963	127.	146.	282.	452.	221.	1367.	440.	941.	332.	7.	8.	19.	11.	4.	336.9
1964	31.	155.	164.	165.	252.	331.	423.	936.	378.	66.	8.	15.	4.	12.	229.7
1965	26.	62.	116.	1887.	2316.	2254.	559.	1167.	176.	52.	34.	12.	5.	5.	706.2
1966	39.	73.	103.	103.	131.	139.	584.	289.	6.	6.	10.	6.	3.	3.	117.0
1967	11.	155.	48.	489.	810.	610.	241.	188.	619.	9.	5.	7.	7.	3.	257.0
1968	50.	122.	107.	502.	260.	1074.	164.	5.	4.	2.	4.	4.	3.	4.	176.5
1969	74.	256.	413.	456.	1331.	591.	854.	2188.	604.	54.	26.	12.	17.	50.	545.0
1970	127.	145.	115.	147.	1931.	1051.	1106.	942.	839.	25.	4.	5.	71.	19.	527.7
1971	118.	172.	286.	241.	1141.	916.	628.	602.	250.	198.	24.	18.	85.	35.	365.4
1972	85.	209.	307.	775.	866.	1636.	3677.	1023.	795.	42.	17.	16.	22.	24.	765.4
1973	108.	151.	120.	486.	548.	160.	208.	8.	7.	7.	5.	6.	7.	5.	141.3
1974	16.	466.	640.	1898.	2010.	1301.	1388.	2800.	1255.	296.	21.	12.	17.	25.	961.8
1975	66.	138.	153.	225.	1580.	842.	1324.	996.	1271.	59.	15.	12.	10.	14.	546.0
1976	99.	196.	208.	1392.	1492.	763.	751.	1922.	645.	12.	10.	17.	7.	4.	608.8
1977	36.	107.	97.	96.	109.	77.	134.	268.	2.	2.	3.	3.	2.	2.	69.1
1978	4.	164.	448.	1177.	757.	727.	1031.	784.	344.	10.	24.	33.	15.	13.	433.6
AVG	70.	168.	279.	552.	693.	845.	954.	1095.	548.	108.	23.	26.	39.	29.	428.2

View of Threemile Dam from above east ladder looking west. Note: Attraction flows over the dam and debris accumulation.



West - Existing louver system used to bypass the downstream juvenile migrants (WEID Canal headgate in background)



West - Juvenile bypass outlet pipe and entrance to fish ladder on west end of Threemile Dam

3. East Ladder

The East Ladder on the right abutment of the dam was constructed in 1914 in conjunction with Three Mile Dam. Additional weirs were constructed at the toe of the dam as part of this ladder in 1963. The ladder is an overflow weir type containing 13 concrete pools, each 6 foot by 8 foot by 6 foot in size. This series of pools contain vertical drops ranging from 6 inches to 1 foot. Because of sedimention problems and access difficulties, this ladder has been used only recently since the West Ladder was completed in 1964. These access problems are the result of sediment buildups and obstructions in the river near the ladder entrance. In 1984 the ladder was reopened and successful passage of steelhead occurred when river flows exceeded about 500 cfs. The ladder does not contain trapping, holding, or counting facilities. No additional attraction water is provided to the ladder entrance. The photos on page 7 show this ladder in operation from both the upstream and downstream side.

II. Existing and Future Fishery Resources

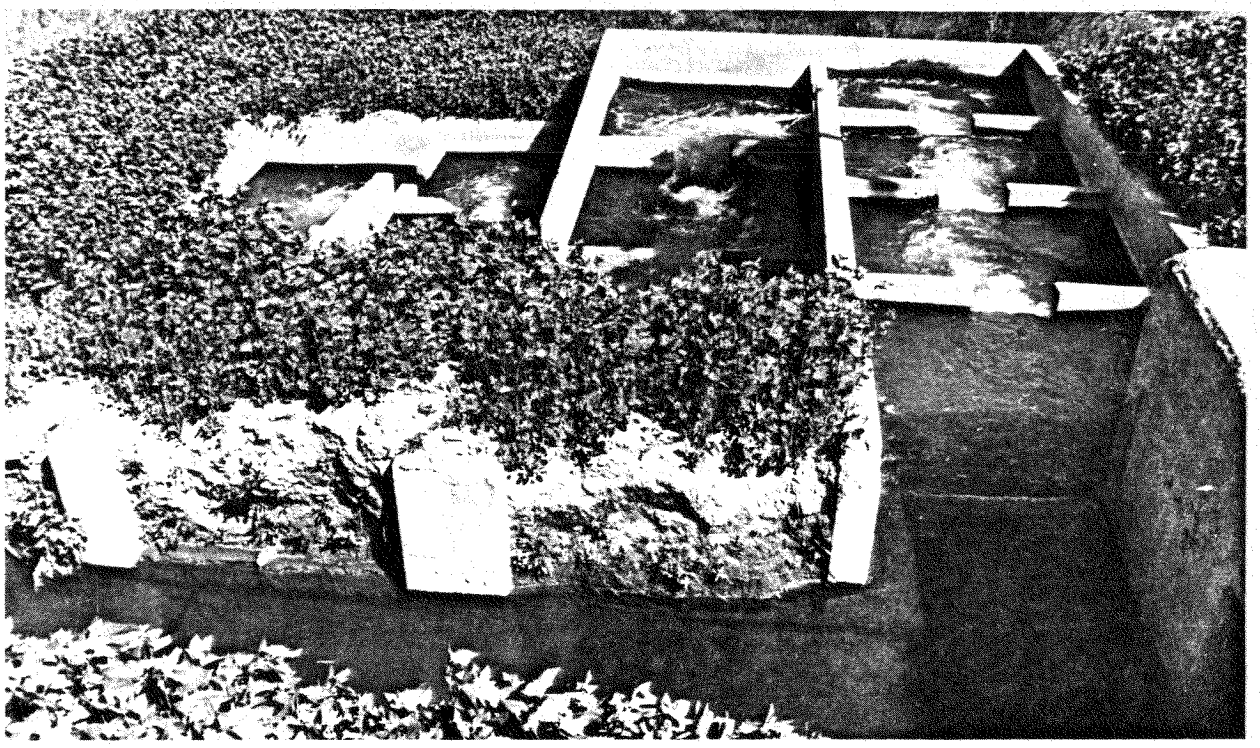
Historically, the Umatilla River System produced large numbers of summer steelhead and fall and spring chinook salmon. The largest run of chinook salmon within the memory of white man occurred in 1914 (Van Cleve and Ting, 1960). In that year, Indians and non-Indians caught "thousands upon thousands of salmon from spring to fall at the site of West Extension Canal and Hermiston Light and Power Company Dams." It was reported that significant declines in the numbers of salmon and steelhead followed that year with the completion of Three Mile Dam.

A. Steelhead

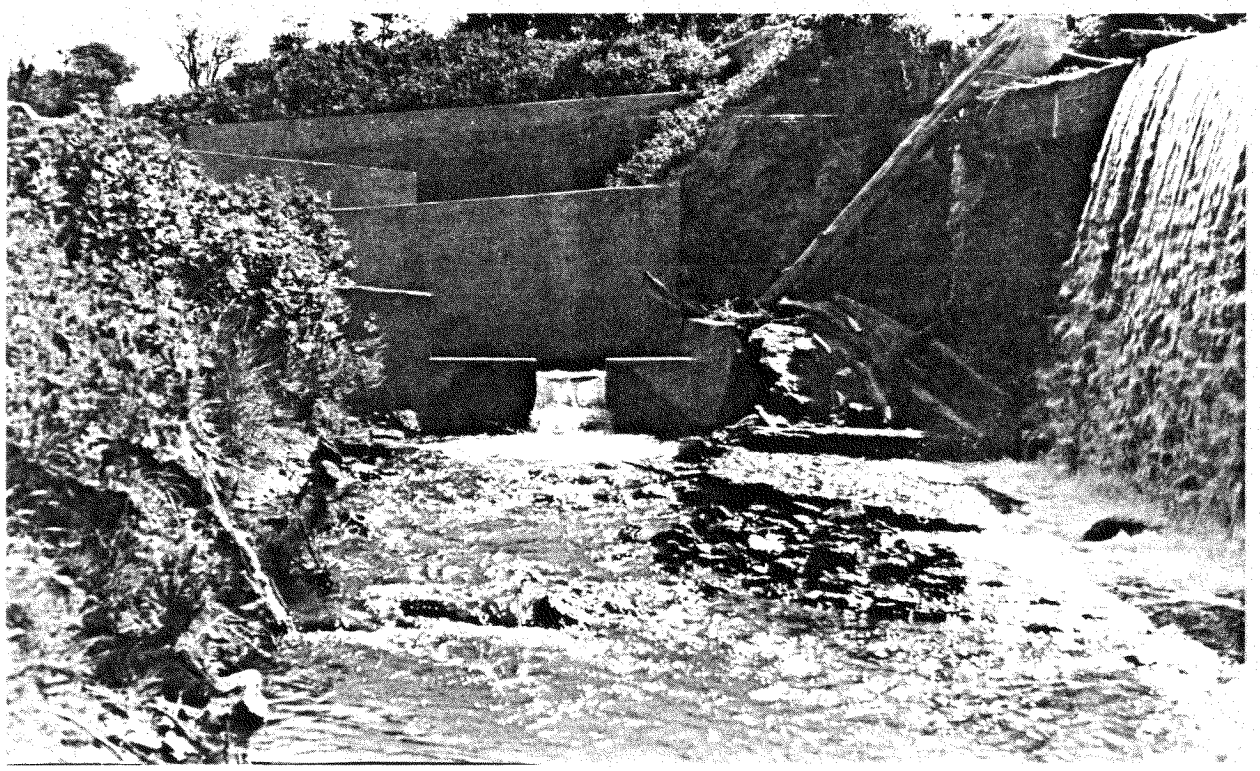
1. Present Situation

The average number of native Umatilla River summer steelhead (based on long-term electronic counts and recent manual counts) passing over Three Mile Dam for the last 14 years has been 1,886 fish.

Adult steelhead use the lower mainstem Umatilla River primarily as a migration corridor. Upstream migration begins as early as October, depending on flows, with the peak occurring between November and March. Most spawning occurs in April and May in the upper Umatilla River and its tributaries. Estimated distribution of Umatilla summer steelhead spawning is as follows:



East - East ladder looking from upstream side showing overflow weir design



East - Entrance to east side fish ladder Note: lack of well-defined channel

Stream	Percent
Meacham Creek	40.0
South Fork Umatilla River	17.0
North Fork Umatilla River	10.0
Mainstem Umatilla River	10.0
Squaw Creek	5.0
Birch Creek	15.0
Other Tributaries	3.0

Egg incubation occurs from April through July. Most rearing takes place in the same tributary streams where spawning occurs. The juveniles typically spend 2 years in freshwater before migrating to sea as smolts. The estimated annual outmigration of summer steelhead smolts is 50,000 to 100,000 native fish. This occurs during the period of April through June. Major periods of summer steelhead use of the Umatilla River Basin are as follows:

Upstream Adult Migration	October - May
Spawning	April - May
Egg Incubation	April - July
Rearing	January - December
Downstream Smolt Migration	April - June

The Oregon Department of Fish and Wildlife (ODFW) began supplemental hatchery outplanting of juvenile steelhead in 1980. Since the program began ODFW has released 19,000 steelhead smolts in 1981, 50,000 in 1982, and 60,000 in both 1983 and 1984. The outplanted smolts are progeny of native adult fish trapped at Three Mile Dam.

2. Future Enhancement

An implementation plan for enhancement of Umatilla River steelhead has been developed by ODFW and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The elements of this plan are presented in their joint Umatilla River Basin Report (1984). Long-term escapement goals for summer steelhead in the Basin are 4,000 hatchery produced adult fish and 5,000 naturally produced adult fish.

Hatchery production goals will be achieved through annual releases of 200,000 steelhead smolts at the existing Bonifer facility and the Minthorn acclimation facility

currently in final design phase. The proposed Umatilla Hatchery near Irrigon (in the predesign phase) will produce these fish. The 60,000 smolts that are currently being reared at existing ODFW facilities and released at Bonifer will continue at least until the Umatilla Hatchery comes online. Any excess broodstock returning to the Bonifer and Minthorn facilities will be used for enhancement of natural production by reseeding (adult or egg outplanting) in under-utilized habitat.

Riparian and instream habitat improvement needs were identified in the Umatilla River Basin Report of January 1984. These projects were submitted to the Power Planning Council in November, 1983 as proposed amendments to the Fish and Wildlife Program of the Northwest Power Planning and Conservation Act (NPPCA) of 1980. Some of these improvements are being implemented in Squaw and Meacham Creek with Bureau of Indian Affairs and Union Pacific Railroad funds. There is an excellent opportunity to vastly improve the natural production of anadromous fish habitat throughout the Umatilla Basin.

Fall Chinook

1. Present Situation

A self-sustaining run of fall chinook has not existed in the Umatilla River since shortly after the construction of Three Mile Dam. However, an abundance of potential spawning habitat is found throughout the Mainstem Umatilla River. In addition, Meacham Creek up to the North Fork also has potential for fall chinook spawning.

Under a fish release program developed by CTUIR and ODFW, juvenile fall chinook have been liberated in the Umatilla River since 1982 at the following rates:

Year of Release	No. of Fish	Size	Stock
1982	4 million	90/lb	Tule stock
1983	100,000	9/lb	Upriver bright stock
1984	225,000	9/lb	Upriver bright stock

Approximately 20,000 and 50,000 fall chinook yearlings were acclimated and released at Bonifer Pond in 1983 and

1984, respectively. The remaining smolts were released in upper Meacham Creek. A few 2 year old mini-jacks, (probably fewer than 100) from the 1983 release returned to the Umatilla River in the fall of 1983. Jacks are also expected to arrive in the fall of 1984.

Adult fall chinook will enter the Umatilla River in October through December, with most spawning expected to occur in November and December. Egg incubation will take place from December to mid-March, with rearing between February and the end of May. Fingerlings will migrate downstream to the Columbia River in March through June.

The major time periods that fall chinook are expected to utilize Umatilla River Basin waters are as follows:

Upstream Adult Migration	October - December
Spawning	November - December
Egg Incubation	November - March
Rearing	February - May
Downstream Smolt Migration	March - June

2. Future Enhancement

The Umatilla Basin Implementation Plan (1984) cites long-term escapement goals of 10,000 hatchery produced and 12,000 naturally produced fall chinook salmon. Approximately 225,000 yearling are programed for acclimation and release at the Bonifer and Minthorn facilities through 1987. Based upon the results of ongoing studies at Bonneville Hatchery, the most cost effective program for juvenile releases will be used. This may include yearling releases, fall reared smolts, or 90/lb. fish. Based upon available data a return of about 2,500 adult fish would result from either program. Returning adult fall chinook will be used as brood stock for hatchery production, and to foster natural production in the system.

The capability of present flows in the Umatilla River to support a self-sustaining run of naturally produced fall chinook is doubtful. The Fish and Wildlife Service (FWS, 1984) evaluated the potential benefits of flow enhancement as part of a Corps of Engineers project to provide flows for anadromous fish from Three Mile Dam downstream to the mouth of the Umatilla River. Channel improvement below Three Mile Dam was also a part of that project.

The channel work is scheduled for completion this year by the Corps with funding from the Bonneville Power Administration (BPA) under the NPPCA. The Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and ODFW are currently analyzing a potential flow enhancement project being planned by the BR to improve flows for anadroums fish in the Umatilla River Basin. The effect of these two flow projects as they relate to passage at Three Mile Dam are discussed in the last section (Item IV, B and C) of this report.

Future fisheries projects identified in the Umatilla River Basin Report (1984), and included in the Fish and Wildlife Program, will also enhance fall chinook runs. These projects include the acquisition of 6,000 acre-feet of McKay Reservoir storage for fish flows, modification or replacement of Umatilla River irrigation screens, and adult passage improvement at Maxwell and Cold Springs diversions.

C. Spring Chinook

1. Present Situation

Large numbers of spring chinook salmon existed in the Umatilla Basin prior to construction of Three Mile Dam. The ODFW reported small numbers of spring chinook in the System into the 1960's, but none have been observed since.

2. Future

Potential spring chinook spawning habitat exists in the upper Mainstem, lower North Fork, and South Fork Umatilla River, and in Meacham Creek. The CTUIR and ODFW have plans for reestablishment of spring chinook in the Umatilla Basin. Escapement goals are 10,000 hatchery produced fish and 1,000 naturally produced fish. However, poor spring passage conditions and lack of deep holding pools for adults could limit the production of these fish. To avoid or reduce potential passage problems, broodstock would be selected for early arrival of adults to avoid low stream flows. When introduced, adults would enter the Umatilla River in April and May and migrate to upstream resting pools near spawning grounds. Adults would hold over in these pools until spawning commenced in late August and September. Most juveniles would rear for a year prior to migration in April, May and June.

Projected time periods of spring chinook use of the Umatilla River Basin are as follows:

Upstream Adult Migration	April - June
Spawning	August - September
Egg Incubation	August - December
Rearing	November - April
Downstream Smolt Migration	April - June

III. Fish Passage Problems Caused by Three Mile Falls Diversion Dam

A. Steelhead

1. Upstream (Adult)

Adult steelhead enter the Umatilla River in the late fall when the irrigation season has ended and natural flows begin increasing (Figure 1, page 13). As runoff increases to medium to high flows (about 500 cfs or greater), a higher percentage of water spills over the crest of the dam and attraction flows at both ladders become a smaller portion of the total flow. This creates a false attraction problem for steelhead in the tailrace area. The resulting migration delay creates increased stress and mortality when fish jump and become trapped in the open bays beneath the dam. An estimated 20 percent of the 1982-83 steelhead return was lost because of these conditions at Three Mile Dam.

The West Ladder is well designed for steelhead passage but lacks adequate attraction flows at the entrance during medium to high flows. The East Ladder is not adequately designed by today's standards. It has poor entrance conditions, poor turn pool conditions, poor exit conditions, and is not self regulating. It also lacks adequate attraction water at all flow levels. Sediment naturally accumulates above the east side of the dam and restricts flow into the East Ladder, thus impeding fish passage. There are no trapping or counting facilities at the East Ladder and only marginal opportunities at the West Ladder.

Debris hanging over the dam crest and accumulating in the tailrace area impedes lateral movement of steelhead along the base of the dam (see photo on page 4). This situation, combined with insufficient attraction flows at the ladder entrances, also creates migration delay and stress. Accumulation of debris above the east side of

the dam restricts the amount of flow entering the East Ladder. Failure to maintain control of debris above and below the East Ladder may cause stranding of adult steelhead.

2. Downstream (Juveniles)

Juvenile steelhead migrate past Three Mile Dam by passing over the crest, through the fish ladders, or through the smolt bypass pipe on the west side. The bypass pipe drops fish 20 feet into the tailrace area below the dam. This may cause injury, stress and possible mortality to smolts, especially during low flow conditions when the bedrock area below the pipe does not contain adequate pool depths. This condition is even worse for those smolts passing over the crest of the dam. Smolts encounter the louver system at the intake of WEID Canal. A NMFS study (1981) indicates that the passage efficency of this type louver system for steelhead smolts under ideal flow conditions is 70 to 95 percent. Passage conditions at Three Mile Dam are probably near the low end of this range because of problems with the approach velocities, nonlaminar flows, and bypass slot velocities. This efficiency does not meet NMFS criteria for screening facility design, which requires successful passage of all fish.

A summary of the current passage conditions for steelhead, expressed as a percentage of adult and juvenile fish passing Three Mile Dam, is provided in Table 1. This information is listed under the No Action Plan, assuming no flow improvements. Future steelhead passage conditions, again assuming no flow enhancement with the present facilities at Three Mile Dam, would not change. However, greater numbers of fish would be impacted as the benefits of the combined CTUIR/ODFW enhancement program are realized.

B. Fall Chinook

1. Upstream (Adult)

As indicated in Figure 1 (Page 3), adequate flows (200 cfs or greater) for adult fish passage to Three Mile Dam can occur during the October through December migration period. During these periods all the passage problems listed for adult steelhead would be common to fall chinook. These include: 1) false attraction flows below the dam; 2) lack of adequate attraction to the ladder entrances; and, 3) debris and/or sediment

Table 1. Assumed Passage Conditions (Expressed as Percentage of Fish Passing) Three Mile Diversion Dam

Alternative	Without Flow Enhancement						With Reclamation Flow Enhancement1/					
	Steelhead		Fall Chinook		Spring Chinook		Steelhead		Fall Chinook		Spring Chinook	
	Adults	Juvenile	Adult	Juvenile	Adults	Juvenile	Adults	Juvenile	Adults	Juvenile	Adults	Juvenile
Alternative A. No Action	75	75	38	50	48	60	80	75	90	50	80	75
Alternative B. Dam Removal	95	95	50	95	65	95	100	100	100	100	100	100
Alternative C. East Side Ladder Only	95	90	45	90	60	90	95	95	95	95	95	95
Alternative D. Two Ladders No Apron	95	90	45	90	60	90	95	95	95	95	95	95
Alternative E. Cap on Crest West Ladder	95	90	45	90	60	90	95	95	95	95	95	95
Alternative F. Ladder in Middle	95	90	45	90	60	90	95	95	95	95	95	95
Alternative G. Concrete Apron Plus West Ladder	95	90	45	90	60	90	95	95	95	95	95	95
Alternative H. Center Cap East Side Ladder	95	90	45	90	60	90	95	95	95	95	95	95

1/ The Corps flow enhancement would produce passage conditions to Three Mile Dam for steelhead and fall chinook adults equal to those listed under "Reclamation Flow Enhancement," and for spring chinook adults and juveniles of all species, the conditions would be equal to those listed under "Without Flow Enhancement."

above and below the dam. In addition to these problems, the overflow weir design of the East Ladder does not promote chinook passage as would the vertical slot design. A submerged orifice or vertical slot is especially important for the ladder entrance.

Migration delays for fall chinook are generally more harmful than for steelhead, due to the relatively short period of time between migration and spawning.

During flow periods that could provide adequate fish passage, movement through the West Ladder could be satisfactory. However, counting, trapping, and holding facilities are poor. During periods of extreme low flows, passage would be reduced or eliminated. Temperature and swimming duration are not expected to cause passage problems.

2. Downstream (Juveniles)

The NMFS study (1981) indicates that the passage efficiency of louvers for fall chinook migrants under ideal flow conditions varies from 40 to 90 percent. The larger sized yearling chinook smolt presently being released would likely be near the upper end of this range. Future outmigrations of natural and hatchery fry and fingerling would likely experience efficiencies near the lower end of this range. The same problems with velocities and nonlaminar flows affecting louver efficiency for steelhead would be more of a problem for the smaller fall chinook. NMFS policy has been to pass 100 percent of the fish, thus passage criteria would not be met in either case. Chinook downstream migrants would also experience the same problem with injury, stress, and possible mortality from the juvenile bypass system as discussed for steelhead.

A summary of the current passage conditions for fall chinook, expressed as a percentage of adult and juvenile fish passing Three Mile Dam, is provided in Table 1 (Page 14). This information is listed under the No Action Plan, assuming no flow improvements. Future fall chinook passage conditions, again assuming no flow enhancement with the present facilities at Three Mile Dam, would not change. However, greater numbers of fish would be impacted as the benefits of the combined CTUIR/ODFW enhancement program are realized.

C. Spring Chinook

1. Upstream (Adult)

Medium to high flows often occur during April and early May of the migration period. With these conditions, problems listed for steelhead and fall chinook at Three Mile Dam would also be common for spring chinook. These include: 1) false attraction flows below the dam; 2) lack of adequate attraction to the ladder entrances; and 3) debris and/or sediment obstruction above and below the dam. In addition to these problems, the overflow weir design of the East Ladder does not promote chinook passage as would a vertical slot design. A submerged orifice or vertical slot is especially important for the ladder entrance.

In late May and into June, flows can rapidly decrease to very low flow conditions because of irrigation diversions (Figure 1, Page 3). Passage during these periods could be significantly reduced or even eliminated. Migration delays for spring chinook would have very serious implications because upstream passage to holding and spawning areas would be impossible later in the spring and into summer. This would especially be a problem during late May and early June for late arriving adults. During periods of adequate flows, movement through the West Ladder could be satisfactory. However, counting, trapping and holding facilities are poor. Temperature conditions and/or swimming duration are not expected to cause passage problems.

2. Downstream (Juvenile)

Spring chinook downstream migrants are expected to be yearling smolts. The NMFS study (1981) indicates that the passage efficiency of louvers for spring chinook smolts under ideal flow conditions varies from 60 to 90 percent. The previously discussed problems with velocities and nonlaminar flows affecting louver efficiency for steelhead would also affect spring chinook. NMFS policy has been to pass all of the fish. Therefore, NMFS passage criteria would not be met. Spring chinook downstream migrants would also experience the same problems from injury, stress, and mortality with the juvenile bypass system as those listed earlier for steelhead and fall chinook.

A summary of the current passage conditions for spring chinook, expressed as a percentage of adult and juvenile fish passing Three Mile Dam, is provided in Table 1

This information is listed under the No Action Plan, assuming no flow improvements. Future spring chinook passage conditions, again assuming no flow enhancement with the present facilities at Three Mile Dam, would not change. However, greater numbers of fish would be impacted as the benefits of the combined CTUIR/ODFW enhancement program are realized.

IV Conceptual Actions

A. No Action

This alternative would maintain the existing passage facilities at Three Mile Dam. Existing management and operations would continue as in the past. Passage conditions would not change at Three Mile Dam. It is assumed that passage conditions below Three Mile Dam would improve. This would be the result of channel improvements planned at several locations in the three miles of river below the dam. This work is scheduled for completion this year (1984) by the Corps of Engineers. The downstream channel improvement work is assumed to be a condition of all the conceptual actions discussed herein.

B. Dam Removal

This concept would involve three major features. These are: 1) removal of the dam; 2) bedrock and/or silt removal if required; and, 3) construction of a new screen facility and bypass system at the future location of the WEID Canal entrance.

Under this concept the dam would be removed down to bedrock to allow the river to pass unimpeded at all flow levels. Specific flow characteristics, (velocities, depth), channel characteristics (drops), and sediment conditions that would exist with this action need additional engineering study. The specific channel design through the area should provide passage conditions consistent with accepted adult salmon and steelhead passage criteria. The opportunity for trapping and counting at this location would be foregone with this plan.

The need to replace flows to the WEID Canal with this plan also should be considered. It is unlikely that adequate conditions would exist to provide for this need at Three Mile Dam. Alternatives include pumping water from the Columbia River or providing a new, low head diversion futher upstream in the Umatilla River. A new diversion dam should have appropriate passage facilities to insure that existing problems are

not just being moved upstream. Any new source of water should be screened to insure safe passage of juvenile fish.

C. East Ladder Only

This concept would involve six major features. These are: 1) improve or rebuild the East Ladder with vertical slots or other state-of-the-art facilities; 2) addition of trapping and counting facilities; 3) improved attraction water; 4) improved fish access to the ladder; 5) maintenance of the forebay and tailrace; and, 6) construction of a new screen and bypass facility at the WEID Canal.

To improve passage through the East Ladder the overflow weir design of the steps would be changed to submerged orifice, vertical slots, or other more acceptable design. Construction of trapping and counting facilities at the ladder would be required. The West Ladder would be nonfunctional under this concept.

With this plan, additional attraction water would be provided at the ladder. During periods of higher flows (500+ cfs) this would be achieved by removal of debris upstream from the point of inflow, allowing greater volumes of flow to enter the ladder. During low flows appropriate features would be designed to assure that a sufficient amount of water for attraction flows could be diverted through the ladder.

An improved channel would have to be constructed through the bedrock at the face of the dam. At higher flows this would induce fish attracted by spill to cross the channel and enter the ladder.

To assure access to the ladder the forebay and tailrace would have to be maintained. This would include removal of debris and sediment which could physically block or hinder fish movement.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

D. Two Ladders, No Apron

This concept would involve seven major features. These are: 1) improved attraction water to the West and East Ladders; 2) addition of trapping and counting facilities at both ladders; 3) convert the overflow type design in the East Ladder to a

type that would improve passage of steelhead and chinook salmon; 4) improved fish access to the East Ladder (but not to the West Ladder); 5) maintenance of the forebay and tailrace at the East Ladder; 6) modify both ladders so they can be shut off to prevent any flow-through; and, 7) construction of a new screen and bypass facility at the WEID Canal.

Under this concept additional attraction water would be provided at both ladders. During periods of higher flows (500+ cfs) this would be achieved by removal of debris upstream from the point of inflow. This would allow greater volumes of flow to enter the ladders. During low flows one of the ladders could be shut off and flow would go through the other ladder.

To improve chinook passage through the East Ladder the overflow weir design of the steps would be changed to submerged orifice, vertical slots, or other more acceptable design. Construction of trapping and counting facilities at both ladders would be required.

An improved channel would have to be constructed through the bedrock at the face of the dam leading to the East Ladder. At higher flows this would induce fish attracted by spill to cross the channel and enter the ladder.

To assure access to the East Ladder the forebay and tailrace would have to be maintained. This would include removal of debris and sediment which could physically block or hinder fish movement.

During low flow periods there may be insufficient water to keep both ladders operational. To maximize the potential for upstream migration one of the ladders may have to be shut off at the upstream end. This would result in all passage flows entering the other ladder and would improve passage conditions. Associated features would be designed to assure that the water would be diverted efficiently, and that the "shut off" ladder and approaches would be completely drained. This would prevent stranding of fish.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

E. Cap on Crest - West Ladder

This concept would involve four major features. These are: 1) improved attraction water to the West Ladder; 2) addition of trapping and counting facilities; 3) addition of a cap on the crest of the dam beginning at the east bank; and, 4) construction of a new screen and bypass facility at the WEID Canal.

Under this concept additional attraction water would be provided at the West Ladder. During periods of higher flows (500+ cfs) this would be achieved by removal of debris upstream from the point of inflow. Also, the cap would allow greater volumes of water to enter the ladder during low flows. The cap would be designed to assure that a sufficient amount of water for adequate attraction flows could be provided at the ladder entrance. The East Ladder would be nonfunctional with this plan. In addition, construction of trapping and counting facilities at the West Ladder would be required.

The addition of a cap on the existing facility would help direct flows near the west bank and eliminate the false attraction flows over the crest of the dam. This flow concentration would also likely reduce the debris problem which exists upstream of the dam.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

F. Ladder At New Location (i.e. Middle of Dam)

This concept would involve four major features. These are: 1) construct a new ladder at an optimum location; 2) insure adequate attraction water to the ladder; 3) addition of trapping and counting facilities; and, 4) construct a new screen and bypass facility at the WEID Canal.

The construction of a new fish ladder located approximately in the middle of the existing facility could be used alone, or in conjunction with the West Ladder. It would be designed with a submerged orifice, vertical slots, or other acceptable state-of-the-art features.

Under this concept additional attraction water would be provided at the ladder. During periods of higher flows (500+ cfs) this would be achieved by removal of debris upstream from the point of inflow. During low flows appropriate features

would be designed to assure that a sufficient amount of water for adequate attraction flows could be provided at the ladder entrances.

Construction of trapping and counting facilities at the new ladder would be required. Access to the ladder must also be provided.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

G. Concrete Apron Plus West Ladder

This concept would involve four major features. These are: 1) improved attraction water to the West Ladder; 2) addition of trapping and counting facilities at both ladders; 3) a concrete apron in the tailrace of the dam (east side only); and, 4) construction of a new screen and bypass facility at the WEID Canal.

Under this concept additional attraction water would be provided at the West Ladder. The East Ladder would be accessible and useable only during high flows. This would be achieved by the concrete apron acting as a velocity barrier to direct both fish and flows in the tailrace to the West Ladder. Flows across the apron would be shallow and swift, thus sweeping any fish off the apron, while at the same time directing them towards the West Ladder. At high flows fish could negotiate the apron and use the East Ladder in its existing condition. The concrete apron would have to be constructed through and on the bedrock at the east face of the dam over to the existing main channel below the west side of the dam. Construction of trapping and counting facilities at the West Ladder would be required.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

H. Center Cap On Crest with Sill-Type Ladder on East Side

This concept would involve six major features. These are: 1) construct a small cap across the center crest of the dam; 2) construct a sill-ladder; 3) improved attraction water to the sill-ladder; 4) improved fish access to the sill-ladder; 5) addition of trapping and counting facilities; and, 6) construct a new screen and bypass facility at the WEID Canal.

Under this concept a small cap would be constructed across the center section of the dam, with lower portions remaining on both sides. The gap on the west side would be slightly higher than the east side gap. This would be designed to direct low flows over the east side of the dam.

A sill-type ladder with several large steps would be constructed on the east side where the present ladder is now located. These would act as a ladder, with vertical drops between each sill. The sills would create resting pools and would be deep enough for fish to negotiate vertical jumps.

Under this concept additional attraction water would be provided at the sills by concentrating all low flows at one location. Moderate flows would also pass through the existing West Ladder or over the crest on the west side as a result of the gap on the west side of the dam. Thus, low to medium flows would pass only over each end of the dam but not over the center. The peak high could pass over the center section of the dam, however, this would be an infrequent occurrence and spread a smaller portion of the total flows over a large enough area, that false attraction flows should not be a problem.

An improved channel would have to be constructed through the bedrock at the face of the dam to the sill-ladder. At lower flows this would induce fish attracted by the spill to cross the channel and enter the East Ladder.

The forebay and tailrace would have to be maintained to assure access to the East Ladder. This would include removal of debris and sediment which could physically block fish movement. Construction of trapping and counting facilities at the West Ladder would be required.

To increase smolt survival it would be necessary to replace the louver and bypass pipe at the WEID Canal headgate. The new screens and bypass facility would comply with ODFW, NMFS, and FWS criteria.

V. Summary

A. Effect of Conceptual Actions Under Present Flow Conditions

Adult and juvenile anadromous fish that reach Three Mile Dam during upstream and downstream migration are confronted with a variety of passage problems. These include: 1) outdated facility design; 2) inadequate attraction flows at the

ladders; 3) inadequate flow through the East Ladder at certain times; 4) sediment and/or debris barriers; and, 5) channel conditions which prevent access to the ladders at some flows. These problems would persist under the No Action Plan. A detailed description of these existing problems is provided in Section III above.

The structural improvements for ladder design and for location, dam modification or removal, and upstream or downstream channel improvements would increase upstream passage of adult fish by about 10 to 20 percent. It is assumed that the dam removal alternative would increase adult passage when compared to the other alternatives because of a small percentage of fish which would not negotiate the structure, even with state-of-the-art designed passage facilities. The opportunity for trapping and counting would be improved with all plans (except for dam removal) and broodstock selection would be available at the dam. Trapping and counting facilities would also allow for a CTUIR terminal fishery at Three Mile Dam; total counts by species to evaluate the habitat improvement measures of the ODFW/CTUIR implementation plan; and trapping and hauling of adult salmon to other areas in the basin where suitable spawning habitat may exist. The lack of these facilities without the dam is not considered to be as important as the improved passage that would result from this alternative. Dam removal would also eliminate expenditures of time and funds required to operate and maintain facilities installed at the dam. With improved design of the juvenile bypass system and more efficient screening, downstream migrant survival would increase by about 15 to 40 percent. A comparison of each plans improvements, for both adult and juvenile fish, is provided in Table 1 (Page 14).

Lack of adequate flows at certain critical times would continue to be the major passage problem for all three anadromous fish species (Table 2). Fall chinook adults would be the most seriously affected because of low flow conditions in September, October and November. Spring chinook passage would be similarly affected, but to a lesser degree, because of low flow periods in May and June. Both early and late returning adult steelhead could experience passage problems during these low flow periods, but the biggest percentage of these fish return during the December through March period when flows are normally adequate. Downstream migrants of all species could experience passage problems because of low flows in May and June. This would require trucking of these smolts during periods of extreme low flow, as is presently done during such periods at the Westland Diversion Dam (river mile 27 on the Mainstem Umatilla River).

Table 2. Present Flow Conditions at Three Mile Dam[1]

	Sept 16-30	Oct	Nov 1-15	Nov 16-30	May	June
Flow Conditions (cfs)						
Average Flow	29	70	168	279	548	108
Median Flow	24	44	145	176	378	33
Number of Years Flows Equal or Exceed 200 cfs[2]	0/44	2/44	9/44	21/44	30/44	8/44

1/ Number of years flows equal or exceed 200 cfs downstream of Three Mile Dam, based on 44 years of record (1935 to 1978) from Figure 1.

2/ The minimum flow for adequate fish passage below Three Mile Dam was considered to be 200 cfs with planned channel improvement (FWS, 1984).

B. Effect of Conceptual Actions Under Reclamation Flow Enhancement

The BR plan (BR, 1982) basically entails a pumping facility to exchange water from the Columbia River for some natural flow rights in the Umatilla River and some McKay Reservoir storage presently diverted for irrigation. Also included is a water storage reservoir on Bear Creek, a tributary to Meacham Creek. This plan would significantly improve streamflow and water quality conditions in Meacham Creek and 79 miles of the Mainstem Umatilla River. Steelhead productivity would be enhanced and salmon runs would be restored on a sustained basis.

The plan provides the following minimum streamflows (cfs) for steelhead trout and chinook salmon in the Umatilla River downstream from the Three Mile Dam.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept 1-15/16-30	Oct	Nov 1-15/16-30	Dec
250	250	250	250	250	250	0	0	0/250	300	300/250	250

Flow enhancement without structural modifications would not eliminate passage problems associated with: 1) false attraction below the dam; 2) lack of adequate attraction flows at ladder entrances; 3) debris and/or sediment obstructions; and, 4) channel problems in the tail-race. However, with the flow improvements shortages during critical periods would be eliminated, and passage conditions would improve. The combination of structural improvements (plans C to H) plus flows, would eliminate all major passage problems. The dam removal alternative with flows provides for 100 percent passage of anadromous fish, while the structural plans are assumed to impact a small percentage of fish that would not successfully pass the structure. Compared to the existing passage problems without flow enhancement, improvements would range from about 20 to 55 percent for adult fish, to about 25 to 45 percent for juvenile fish. A comparison of each plans improvements with BR flows, for both adult and juvenile fish, is provided in Table 1 (Page 14).

C. Effect of Conceptual Actions Under Corps Flow Enhancement

The Corps of Engineers plan (Corps, 1981) entails use of an existing pumping plant to transport water from near the mouth of the Umatilla River up to Three Mile Diversion Dam.

The pumped water would be added to the WEID Canal to ensure adequate water for irrigation uses. This would allow Umatilla River water to be bypassed as the minimum flows for fishery enhancement. This proposal only provides flows from Three Mile Dam downstream, and has no provisions for flow related improvements upstream from the dam.

The Corps' plan would provide the following minimum streamflows (cfs) for steelhead trout and chinook salmon in the Umatilla River downstream from Three Mile Dam.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
200	200	200	200	100	100	0	0	20	200	200	200

Flow enhancement without structural modifications would not eliminate passage problems associated with: 1) false attraction below the dam; 2) lack of adequate attraction flows at ladder entrances; 3) debris and/or sediment obstructions; and, 4) channel problems in the tailrace. However, with the flow improvements, shortages during some critical periods would be eliminated, and passage conditions would improve.

In comparing the Corps flow enhancement project with the BR project the two major differences are: 1) the amount of water provided during the months of September, May and June; and, 2) water with the Corps project would be provided only at Three Mile Dam, while the BR project provides water upstream from Three Mile Dam. In terms of fish passage, the May and June flows with the Corps project (100 cfs versus 250 cfs with BR) are not considered adequate for upstream passage of adult spring chinook. Also, because May and June do have periods of low to no flows as a result of irrigation withdrawals, water provided at Three Mile Dam would not eliminate the need to truck outmigrating smolts that would otherwise be stranded at upstream diversions. The flow differences in September would impact early returning adult fall chinook. However, this should be a very small portion of the run when compared to adults that would return during the October through December period. A comparison of each plan's improvements with the Corps flow enhancement, for both adult and juvenile fish, is provided in Table 1 (Page 14).

APPENDIX B

DOCUMENTATION OF CONSULTATION FOR THREATENED AND ENDANGERED SPECIES

March 18, 1985

Bob Adair, Endangered Species Coordinator

Section 7, Endangered Species Act - Fish Passage Improvements at Three Mile Falls Diversion Dam, Umatilla River, Oregon

Regional Environmental Officer

On March 5, 1985, Bill Mullins and I phoned Jay Gore, Endangered Species Project Leader in Boise to discuss the need for consultation under the Endangered Species Act for the subject project.

The subject project was one part of the Umatilla project, and a biological assessment was submitted to the Fish and Wildlife Service, Endangered Species Office in Boise on May 17, 1984, concerning the listed bald eagle. On September 27, 1984, we received the Fish and Wildlife Service's Biological Opinion which stated that the Umatilla project would promote the conservation of the species (bald eagle).

Based on the Umatilla project assessment and biological opinion, Jay Gore told us on the phone that no further consultation was necessary for the Three Mile Falls Diversion Dam Fish Passage Improvements project.

United States
Department of the Interior

Fish and Wildlife Service
Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, Oregon 97232

In Reply Refer To: AFA-SE

Your Reference: 1-4-84-F-56

SEP 27 1984

MEMORANDUM

TO: John W. Keys, Assistant Regional Director, Bureau of Reclamation
Federal Building and U.S. Courthouse, Boise, ID 83724

FROM: Acting Assistant Regional Director, Federal Assistance, USFWS,
Region 1, Portland, OR (AFA-SE)

SUBJECT: Umatilla Basin Project Formal Section 7 Consultation

Dear Mr. Keys:

This is the U.S. Fish and Wildlife Service's (FWS) biological opinion prepared in response to your July 25, 1984, request for formal consultation regarding the effects on the bald eagle (Haliaeetus leucocephalus) of implementing the Umatilla Basin Project to enhance the anadromous fishery. The FWS has examined the proposed action in accordance with Section 7(a)(2) of the Endangered Species Act of 1973 (ESA), as amended.

On September 20, 1984, we completed our review of the Umatilla Basin Project, the documents you provided with your consultation request, and information in our files. In the course of this review, the following people were contacted and contributed additional information used in this opinion:

Rick Prang, Bureau of Reclamation
Ron Garst, U.S. Fish and Wildlife Service
Charles Craig, U.S. Fish and Wildlife Service
Gary James, Confederated Tribes of the Umatilla Indian Reservation
Jerry Lauer, Bureau of Indian Affairs

Biological Opinion

It is our biological opinion that the proposed action will promote the conservation of the bald eagle. This conclusion is based on the following account of the proposed activities.

Project Description

The Umatilla River basin is one of Oregon's important agricultural, commercial, and educational areas. Pendleton, Hermiston, Umatilla, Stanfield, and other communities are located here and make the area the most populous in the eastern part of the state. The Federal Umatilla Reclamation project managed

by the Bureau of Reclamation (BR) is a primary feature of the basin's development. The project, with McKay and Cold Springs Reservoirs and other facilities, serves about 30,000 acres in Hermiston, West Extension, Standfield, and Westland Irrigation Districts. There are over 700 farm units within the project supporting a population in excess of 12,000 people. Gross crop value from the project totaled $6.6 million in 1981.

The homeland of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is located here. The tribes entered into a treaty with the United States in 1855, which formed a trust relationship between the tribes and the Federal Government and established the 250-square-mile Umatilla Indian Reservation as a permanent homeland for the tribes.

The Bureau's study is being conducted in close consultation with representatives of the tribes, irrigation districts, and other key entities. The study has reached a point where a Preferred Plan has been identified. The plan concept addresses the tribal objectives of restoring salmon and steelhead runs. The BR Preferred Plan study is viewed by the tribes and irrigators as the only means short of confrontation and litigation to identify and carry into implementation a water development program to achieve tribal fishery restoration objectives and meet other tribal water needs without seriously impacting existing non-Indian water uses.

The Preferred Plan is basically a fishery enhancement plan and includes an exchange program which would pump water from the Columbia River, which borders the basin in the north, into existing irrigation storage and distribution facilities serving irrigation districts within the Federal Umatilla Project. This "imported" water supply would permit Umatilla River water, which is now diverted or stored for irrigation use, to remain in the Umatilla River to improve flow conditions for salmon and steelhead migration, spawning and rearing. The second key feature of the development is construction of a storage reservoir in the basin's headwaters at the Bear Creek site which would improve flow conditions in a key tributary and in the Umatilla River as it passes through the reservation. The added water supply needed for salmon and steelhead (*Salmo gairdneri*) restoration under the tribes' reserved treaty rights would be provided at critical periods of the year and in critical stream reaches. These flow levels would result in a desirable level of steelhead, fall chinook (*Oncorhynchus tshawytscha*), and spring chinook escapement. One hundred percent of the fall chinook, 96 percent of the steelhead, and 70 percent of the spring chinook tribal natural production goals would be met with this development.

The Umatilla River has historically supported runs of chinook salmon. The largest run within memory of white men occurred in 1914, when it is reported that "thousands upon thousands of salmon from spring to fall" were caught at the site of the West Extension Canal and Hermiston Light and Power Company Dams. Today, these runs no longer exist, and their restoration is a primary objective of the CTUIR, State and Federal fishery agencies, and a large segment of the public. Potential chinook spawning and rearing areas within the basin are shown on the Anadromous Fish Spawning and Rearing Areas Map I.

This consultation specifically addresses the fall chinook fishery resource that would be established as a result of the implementation of the Preferred Plan. There will be an estimated escapement of 12,000 fall chinook which would use natural spawning gravels in the Umatilla system (U.S.D.C. 1984). These fish would enter the Umatilla River Basin in September thru mid-November to spawn and eventually die.

Species Account

The bald eagle is listed as endangered in 43 of the 48 conterminous United States. The population found in Oregon is one of five states where it is listed as threatened. Fall migration of bald eagles through the Northwest generally occurs from September through late December. Within their migratory and winter ranges, eagles tend to congregate in large numbers at sites where food is abundant, and to occur singly or in small groups where it is more limited. Salmon spawning runs have attracted bald eagles for centuries. Because all Pacific salmon entering the Columbia River die after spawning, they provide a food source to which eagles and other wildlife are drawn. For example, Dawson and Bowles (1909) wrote: "Fifty years ago bald eagles existed on Puget Sound and along the banks of the Columbia in almost incredible numbers. They could obtain all the fish they wanted." Significant concentrations of bald eagles still occur at natural salmon runs along several northwestern rivers, including the Skagit, Nooksack, Fraser, and most notably the Chilkat in southeastern Alaska, where more than 2,800 eagles have been counted at the autumn concentration (Boeker et al. 1980).

In contrast, more than half of the habitat in the Columbia River watershed orginally accessible to salmon is no longer available. One can only imagine the numbers of bald eagles drifting in from northern latitudes to the Umatilla River basin during the fall prior to the 1900's. Their primary attraction being the moribund fall chinook beached on gravel bars and along the riverbanks. Mid-January surveys conducted since 1980 show the Umatilla Basin supports no more than 12 bald eagles during any one year. This includes surveys conducted at Cold Springs National Wildlife Refuge and the adjacent banks of the Columbia River. A maximum of two bald eagles have been observed along the Umatilla River during these counts. Incidental sightings of one or two adult birds have been recorded during the fall season. No bald eagles nest in the Umatilla Basin.

Analysis of Impacts

With the implementation of BR's Preferred Plan for the enhancement of the fishery in the Umatilla River Basin, particularly the fall chinook salmon, we predict that bald eagles will be attracted in numbers well above what are presently found there. This is based on four basic requirements that serve to attract bald eagles: (1) an available food source found in abundance; (2) day perch sites; (3) protection from human activities; and (4) night roosting sites.

Available Food Source. With respect to the first requirement of food, Stalmaster (1981) estimated that a bald eagle needs the equivalent of 1.1 pounds of salmon per day to meet minimum energy requirements. Assuming adequate passage and flows, the National Marine Fisheries Service (NMFS) estimates that between 10,000 and 12,000 spawning adult fall chinook could be accommodated in the Umatilla River (U.S.D.C. 1984). The greatest potential for natural production of fall chinook lies between Pendelton (River Mile 54.9) and Squaw Creek (River Mile 74.9) where a total of 86,285 square yards of spawning area are available (Map I). At 18.75 pounds/fish (U.S.D.C. 1984) and using the higher estimated return of adult fish (12,000), we calculate that a potential of 225,000 pounds of salmon could be available to bald eagles during the months of September through November. This renewed food source would provide another area in the northwest for eagles to use during fall migration. Competition for food would be less for each eagle which should allow for improved physical condition. Breeding eagles should return to their nesting territory in a well nourished state. Productivity would tend to be higher than for breeding eagles less well fed. Similar feeding opportunities during fall migration have been provided at Glacier National Park where landlocked Kokanee salmon (*Oncorhynchus nerka*) were introduced by man (McClelland 1982).

Day Perch Sites and Protection. Within the Pendelton-Squaw Creek reach of the river, there is a predominance of mature cottonwood (*Populus* sp.) with an understory of willow (*Salix* sp.). Even though a railroad and highway parallels this reach, there are isolated gravel bars and groves of mature cottonwood that will provide for feeding opportunities and protection from human activities during the day.

Night Roosting Sites. Potential habitat for night roosting is present above Meacham Creek (River Mile 77.1) where ponderosa pine (*Pinus ponderosa*) becomes the dominant species. The area is less developed and provides protection from winds, which is one of the most important features of roosting habitat. This habitat is similar in structure to the Upper Columbia River in Washington described by Allen (1979) where a minimum of 60 bald eagles are known to winter.

Biological Opinion

Based on the information provided in the BR's Biological Assessment, data in our files, and the behavior of migrating bald eagles at Glacier National Park, Montana, the Skagit River and other rivers of the northwest, it is our biological opinion that implemention of the Preferred Plan of the Umatilla Basin Project will promote the conservation of bald eagles by providing a renewed food source for migrating and wintering eagles.

Incidental Take

Section 9 of the ESA prohibits any taking (harm, harassment, mortality, etc.) of listed species without special exemption. Under the terms of Section 7(b)(4)iii and 7(2), taking that is incidental to and not intended as part of the agency action is not considered taking within the bounds of the Act provided that such taking is in compliance with the terms and conditions of this Biological Opinion. We here-by establish such terms and conditions on incidental take: (1) If an individual(s) of the listed species discussed in this opinion dies or is injured as a result of subject project, the BR shall require that the causitive action of such action cease immediately and shall reinitiate formal consultation and/or seek authorization under Section 10(a)(1)(b) prior to proceeding with the action; (2) the BR will take necessary measures to preserve or enhance the existing riparian habitat mentioned in this consultation; (3) all dead or injured individuals shall be retrieved and turned over to the Regional Director, FWS, or his representative; (4) BR shall immediately telephone the Endangered Species Office of this Service in Boise, Idaho if incidental take occurs and prepare a written report which shall include the date, location, and circumstances surrounding the taking and the dispositions of the individual(s) taken. Written and telephone reports should be directed to James F. Gore at our Endangered Species Office in Boise, (208) 334-1806 or FTS 554-1806.

Summary

The proposed action presented in this opinion will contribute to the conservation of the bald eagle. In turn, the BR would be utilizing their authority to implement a program for the enhancement of listed species, as required under Sections 2(c) and 7(a)(1) of the ESA.

This concludes formal consultation on the Preferred Plan action. If the project is significantly modified in a manner that would change the impacts discussed in the opinion, if new information becomes available on this species that could change the conclusion of the opinion, or if a species located in this area is added to the endangered species list, formal consultation should be reinitiated.

Sincerely,

for William F. Shake
Assistant Regional Director
Federal Assistance

Literature Cited

Allen, H.L. 1979. An inventory of bald eagle habitat on BLM land in Washington. Washington Department of Game. Olympia, Washington. p. 71-103.

Boeker, E.A., A.J. Hansen, and R.A. Meredith 1980. Chilkat River Cooperative Bald Eagle Study, Anchorage, Alaska, Natl. Audubon Soc.

Dawson, W.L. and J.H. Bowles. 1909. The birds of Washington, vol. 2. Seattle, Washington, Occidental Publ. Co.

Mc Clelland, B.R. et. al. 1982. The bald eagle concentration in Glacier National Park, Montana: Origin, growth, and variation in numbers. The Living Bird. Cornell Laboratory of Ornithology. p. 133-155.

U.S. Department of Commerce. 1984. National Marine Fisheries Service Coordination Act Report on the Umatilla River Basin, Oregon. August 1, 1984. Portland, Oregon. 24 pp.

LETTERS OF COMMENT
ON
ENVIRONMENTAL ASSESSMENT
AND
RESPONSES

Stuart F. Bonney
UMATILLA BUFFALO RANCH
P. O. BOX 302
HERMISTON, OREGON 97838

Proposed Fish Passage at 3 Mile Dam

Dear: Douglas James

I Think from Reading These Proposals The costs, The maintance and The Power Required and The fish That will make it up stream You Should look at This Proposal.

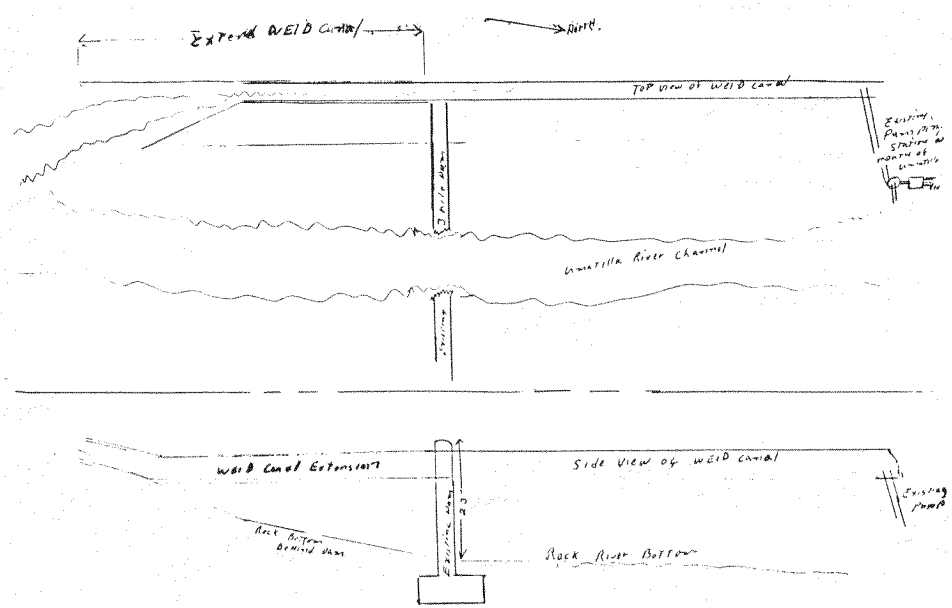
Remove Dam & Extend WEID Canal up River To a Point That water will Gravity feed into it from The Umatilla River's Natural Rock Bottom, Install Head gate So If Fish are not Getting Enough flow or Brownell ditch is Not Getting Enough flow it can be closed Partially or all The way. At This time Existing Pump for weid canal can be Started.

The WEID Canal Should Extend up The Umatilla River far Enough So when Existing Pump is started water Doesn't flow Into Umatilla River.

Benifits: 1. fish will Have There Natural Run
2. This Dam Silts up to The top of it Every year and will be very Expensive To clean Enormous amounts of Trash and Silt out
3. Existing Ditch Rider on WEID Canal can adjust water flow or Start Pump
4. This may make Indians happier and all Taxpayers happier
5. I Think we could all survive without having a Fish Count Here

Stuart F. Bonney

UMATILLA BUFFALO RANCH
P. O. BOX 302
HERMISTON, OREGON 97838
(503) 922-9797



An alternative similar to the one proposed was considered early in the plan formulation process. It was not considered further because there would be no opportunity to count and trap fish under this alternative. State and Federal fishery managers consider the ability to count and trap fish in the lower Umatilla River essential to fishery management goals and objectives. Also, this alternative would be quite expensive because of the costs associated with extending the WEID canal and pumping. The need for fish screens at the new canal headworks would add further to the costs.

Thank you for your review and comments.

OREGON TRAILS TOURISM COUNCIL

P.O. Box 185
Echo, Oregon 97838

(503)376-8411

20 November 1985

Regional Director
Bureau of Reclamation, Attn: 150
Box 043, 550 West Fort St.
Boise, Idaho 83724

Subject: Comments on Fish Passage Improvements at Three-Mile Falls Diversion Dam, Umatilla River, Oregon

Dear Sir:

The Oregon Trail Tourism Council is an informal association of concerned individuals interested in developing the tourism/recreational/historical and educational potential of this area by developing our unique man-made, natural and historical resources. Attached as enclosures to this letter are copies of newspaper articles and other documents which generally cover our concerns and proposed plans for the development of the lower Umatilla River area from Hermiston to Umatilla as a recreational area and exploitation of it's potential attractions such as the dam.

We have no objection to any of the fish passage proposals for the dam and fully support all efforts to improve the fish population of the river because such an accomplishment would, in itself, create another attraction of observing the fish runs.

We do feel, however, that your assessment did not take into account the factors outlined in the enclosures. Incorporation of them into your plan would aid us in our developmental efforts. In general, we feel that any changes at the dam should include on the right bank a public parking area, public access to view points near the fish ladder and an interpretative display pertaining to the history of the dam, i.e., reason for construction, impact on areas, growth, negative impact on fisheries and changes made to reverse the negative impact. We would also like to see a hiking trail segment along the river bank above and below the dam established which could eventually tie into the river hiking trail proposed in the City of Umatilla's urban growth boundary plan. This plan covers the river from Umatilla to Bensel Road just ~~south~~ NORTH of the dam.

The use of excess excavated material to create and improve off-road parking areas along the river south to the City of Umatilla would also be beneficial.

Further information can be obtained from Diane Berry, Secretary, O.T.T.C. and Mr. Hart Seeger, City Administrator, Umatilla, Oregon.

Respectfully,

John A. Bennett

JAB/mf
Encl.

The materials attached to the letter of comment from the Oregon Trails Tourism Council have not been included in this document but may be viewed at the Bureau of Reclamation regional office in Boise.

The Bureau of Reclamation supports the concept of the Oregon Trails Tourism Council to construct parking and interpretive facilities at Three Mile Falls Diversion Dam. Reclamation would be willing to cooperate with the Council in such a project but is not in a position to provide funding.

Thank you for your review and comments.

VICTOR ATIYEH
GOVERNOR

Department of Transportation
HIGHWAY DIVISION
TRANSPORTATION BUILDING, SALEM, OREGON 97310

November 22, 1985

Regional Director
Bureau of Reclamation
Attention: 150
Box 043 - 550 West Fort Street
Boise, ID 83724

SUBJECT: Environmental Assessment
Proposed Fish Passage Improvement at
Three Mile Falls Diversion Dam
Umatilla River, Oregon

The Oregon State Highway Division has no comments to offer on the subject environmental assessment because no state-owned highway facilities are affected by the proposed improvements. We do wish you the best in advancing this important project to completion.

Thank you for your review.

Sincerely,

Cam Gilmour

Cam Gilmour, Manager
Environmental Section
Oregon State Highway Division
324 Capitol Street N.E.
Salem, OR 97310

leb

VICTOR ATIYEH
GOVERNOR

Water Resources Department

3850 PORTLAND ROAD NE, SALEM, OREGON 97310 PHONE 378-3671

November 22, 1985

Regional Director
Bureau of Reclamation
Attention: 150
Box 043-550 West Fort St.
Boise, ID 83724

The Oregon Water Resources Department reviewed the Environmental Assessment for the "Proposed Fish Passage Improvements at Three Mile Falls Diversion Dam, Umatilla River, Oregon." We found the document to be helpful in understanding the fishery effects of the existing structure and flow patterns. It also did a good job of explaining anadromous fishery goals and the effect of alternative actions, with and without streamflow improvements.

There were three areas where clarification would be helpful and these may relate more to alternative project costs than environmental effects. The areas are listed below.

1. The comparative summary of alternatives in Table 1 does not make it clear why the "two fish ladder" option would be selected over the "west ladder and apron" option. Construction costs are nearly equal. Operation and maintenance was lower on the latter option. Is there expected to be a difference in the success of the facilities in passing fish? Are other uncertainties, environmental effects or intangibles the main reason for the preference? If so, the reasons should be stated more clearly, because it appears an economic decision could favor option B.

2. It does not seem that the costs and effects option D, removal of Threemile Dam and pumping from a downstream location to West Extension Canal, have been properly distributed. This option helps accomplish two objectives rather than just passage. According to the assessment in Table 3, with flow augmentation, it would eliminate any barrier to passage. The figures in Table 4 indicate average total flow at Threemile "Falls" would be sufficient for passage nearly all of the time because the diversion

The two fish ladder option (Alternative A) was selected as the proposed action over the west ladder and apron option (Alternative B) because the effectiveness of the first is more certain. There were some concerns among biologists and engineers involved in the design of the fish passage facilities that the barrier might not perform as expected and that debris or unfavorable hydraulic conditions would create pockets of false attraction flows which in turn would impede adult migration. The only way to "prove" the effectiveness of the apron would be through the development of a physical model to test the design, adding significant time and cost to this alternative. Please refer to Table 1 "Disadvantages" under "Concrete Apron Plus West Ladder" on page 19 of this environmental assessment (EA).

point for West Extension would be moved downstream. Since the pumping plant for West Extension is the primary cost element of the alternative, the cost reflects both passage and flow benefits for this section of the river. The other options only remove passage barriers. A comparable analysis would either subtract the flow augmentation (pumping plant) costs from dam removal, or change the cost analysis of other options to include similar flow augmentation costs and benefits. For example, if the dam were removed, the cost of some other form of screened diversion at the Threemile site under D could be added and pumpings costs could be subtracted. On the other hand, if the pumping station in the Umatilla or Columbia River is likely to replace Threemile Dam diversion for West Extension water as a flow augmentation measure anyway, then fish screens at West Extension Canal would be unnecessary under options A, B, and C. The cost of screens could be substracted from those options and the cost of pumping be added to compare these options with the dam removal and pumping costs in this report. The final environmental impact statement should attempt to separate passage and flow augmentation factors.

The comparisons in the EA are valid. Tables 2 and 3 on pages 23 and 24 provide a comparison of the passage conditions and recognizes that dam removal and downstream pumping would be somewhat more effective than the other options. The improvement in passage conditions from the dam to the mouth is an incidental benefit. The cost of dam removal would be the same whether passage is improved or not.

3. The final comment pertains an implication in the Environmental Consequences to Fishery Resources. The statement in question is in paragraph 2 of page 24:

   "The cumulative effect of the proposed program would be small relative to the overall effect of implementing the entire Columbia River Basin Fish and Wildlife Program - other activities and projects will be addressed in their own environmental review documents because they are independent parts of the overall Fish and Wildlife Program." (emphasis added).

This paragraph suggests that the Umatilla Project is some way more cumulative and less independent than other aspects of the Fish and Wildlife Program. If this is true, the "cumulative effect" should be more fully described. This may just be a poor choice of words, however, the meaning of "cumulative effects" or "cumulative impacts" is currently subject to nationwide review for hydroelectric projects. In nearly all instances, it has been used to describe negative aspects of several development activities that exceed the sum of the negative effects from each "independent part." It is unclear what a cumulative beneficial effect would be. If the Umatilla passage improvements are an independent part of the overall Fish and Wildlife Program, then its costs and benefits should be compared with costs and benefits of other "independent parts" or with the total costs and total benefits of implementing the entire Columbia River Basin Fish and Wildlife Program.

This cited paragraph has been revised in the EA for clarification. Reclamation does not mean to imply that the Umatilla Project is more cumulative and less independent than other elements of the Fish and Wildlife Program. The point to be considered is that the proposed project is but one small, but important, part of a much bigger picture encompassed by the Fish and Wildlife Program, and each activity under this program is to be examined separately.

The present wording casts a negative tone on the benefits of this proposal that the analysis has not established.

I hope these comments will assist the Bureau of Reclamation in completing the final Environmental Impact Statement.

Sincerely,

William H. Young

WILLIAM H. YOUNG
Director

WHY:jt

1385D

Thank you for your review and comments.

Hermiston Oregon
Rt 5 Box 5560
97838

Dear Sir,

I am interested and would be very happy to have the three mile dam in the umatilla river destroyed and out of there, That fish ladder has never worked and pump the water to the ditch from the Columbia river.

Thank you
Earl Stewart

Dam removal was considered as an alternative (page 18 in the EA). It is, however, the most expensive alternative, costing over twice as much as the proposed action. Pumping from the Umatilla River would be needed to replace water now diverted by the dam. Pumping costs are high and may increase in the future. The opportunity for fish trapping/counting facilities would also be foregone. The large quantity of sediment which has accumulated behind the dam would have to be removed to avoid severe environmental problems downstream.

Thank you for your review and letter of comment.

Regional Director
Bureau of Reclamation Atten. I50
Box 043, 550 West Fort St.
Boise Id. 83724

December 5. I985

Dear Sir;

I have read your pamplet on proposed fish passage improvements at Three Mile Falls dam on the Umatilla river, and am heartily in favor of any plan that would improve the river from the dam down to Umatilla. I have no official status, and my primary interest is to promote the scenic attraction and availability to public view of the area.

Of the various plans proposed, I wish to recommend plan "A" since it would require annual removal of the unsightly logs and trash that now disfigure the area. Second choice would be plan "I3".

Concerning plans to improve river flow below the dam by pumping water out of the Columbia river, I have not seen any mention of pumping from above Mc Nary dam and piping water across the valley to the Weid Canal, Initial costs would be higher,but yearly costs would be much less.This plan would also allow water from the pipe line to be used to replace water now taken by the Brownell diversion dam,which has been taking nearly every drop of water out of the lower reach of the river during dry months.

Thank you for taking time to read this.

Yours Sincerly,
Bert Rozema

Bert Rozema

Plans to improve flows in the Umatilla River are being developed under Reclamation's Umatilla Basin Project, which is a separate project. This plan proposes a water exchange under which the West Extension Irrigation District would forego diverting water at Three Mile Falls Dam, allowing water to be used for fish flows in the river below the dam. This water would be replaced by pumping from the Columbia River into their canal. Under a second proposal, the Stanfield and Hermiston Irrigation Districts would forego diversion of natural flows in the Umatilla River when streamflow drops below 250-300 ft^3/s. Stanfield ID storage in McKay Reservoir would be used for fish flows; this water would be replaced by pumping from the Columbia River above McNary Dam. A planning report/draft environmental statement describing these proposals will be available to the public during spring 1986.

Thank you for your review and comments.

VICTOR ATIYEH
GOVERNOR

Department of Transportation
STATE HISTORIC PRESERVATION OFFICE
Parks and Recreation Division
525 TRADE STREET S.E., SALEM, OREGON 97310
December 6, 1985

Douglas James
Bureau of Reclamation
Federal Building and
US Courthouse
Box 043-550 West Fort St.
Boise, ID 83724

RE: Three Mile Falls Diversion Dam
Proposed Fish Passage Improvements
Umatilla County

Dear Mr. James:

We have reviewed the Environmental Assessment for the proposed fish passage improvements at Three Mile Falls Diversion Dam on the Umatilla River in Oregon. As we have noted previously, we have no record of any sites around the Three Mile Falls Diversion works. There are no known sites along the irrigation canel, and the proposed pumping station area has been surveyed for cultural resources with a negative result.

There are a number of major sites at the mouth of the Umatilla River, and one site in section 17 on the river away from the proposed project area. As long as the proposed project is confined to those areas as identified within the Environmental Assessment there should be no impact. If you have any questions you can contact Dr. Leland Gilsen at 378-5023.

Sincerely,

D.W. Powers, III, Deputy
State Historic Preservation Officer

DWP:jn
8585C

Thank you for your review and comment.

VICTOR ATIYEH
GOVERNOR

Department of Transportation
PARKS AND RECREATION DIVISION
525 TRADE STREET SE., SALEM, OREGON 97310

December 9, 1985

Regional Director
Bureau of Reclamation
150 Box 043-550
West Fort St.
Boise, ID 83724

RE: Three Mile Falls Diversion Dam
Umatilla, Oregon

The State Parks and Recreation Division has reviewed the environmental assessment for the proposal to provide fish passage at Three Mile Falls diversion on the Umatilla River. The Parks Division at this time has no comment regarding this project. As in the past, we appreciate the opportunity to be involved in the Bureau's planning activities.

Please keep us advised of the progress made toward the implementation of this project.

Sincerely yours,

Alan J. Cook, Manager
Planning and Grants

AJC:kc
8594C

Thank you for your review and comment.

TRI-STATE STEELHEADERS

A CONSERVATION ORGANIZATION

P.O. Box 1375 — Walla Walla, Washington 99362

December 10, 1985

Regional Director
Bureau of Reclamation
Attention: 150
Box 043-550 West Fort Street
Boise, Idaho 83724

Dear Sirs:

As a regional conservation organization located in Walla Walla, which is fifty miles distant from the Umatilla River, we are highly in favor of the project to mitigate damages to the anandramous fishery caused by the installation and operation of Three Mile Falls Dam.

The Umatilla River provides a great potential spawning and rearing environment if made accessible to the returning spawners. We favor replacement of the fish ladder on the east bank and modification of the west bank ladder at Three Mile Dam.

I would appreciate the inclusion of our group onto your mailing list of both draft reviews and final statements concerning the Umatilla River mitigation projects.

Sincerely,

Larry Zalaznik

Larry Zalaznik
President

LZ/ps

Your organization has been added to those mailing lists. Thank you for your review and comment.

FISHING FUN FOR EVERYONE

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Baker Resource Area Headquarters
P. O. Box 987, Baker, Oregon 97814
503-523-6391, Ext. 324

IN REPLY
REFER TO:

1792

Dec. 10, 1985

Regional Director, Bureau of Reclamation
Pacific Northwest Region
Federal Building
Box 43, 550 West Fort Street
Boise, Idaho, 83724

To the Regional Director:

We have reviewed the Environmental Assessment on "Proposed Fish Passage Improvements at Three Mile Falls Diversion Dam, Umatilla River, Oregon".

We commend and support your efforts to correct the situation to improve fish passage on the Umatilla River.

Thank you for allowing us to comment.

Sincerely yours,

Jack D. Albright

Jack D. Albright
Area Manager

Thank you for your review and comment.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
847 NE 19th AVENUE, SUITE 350
PORTLAND, OREGON 97232-2279
(503) 230-5400

December 10, 1985 F/NWR5:861

Mr. Douglas J. James
Bureau of Reclamation
Federal Building and U.S. Courthouse
Box 043-550 West Fort Street
Boise, Idaho 83724

Dear Mr. James:

The National Marine Fisheries Service (NMFS) has reviewed the Environmental Assessment (EA) for proposed fish passage improvements at Three Mile Dam on the Umatilla River, Oregon. We offer the following comments.

NMFS favors the proposed action of two fish ladders and new fish screens in the West Extention Irrigation District canal. We feel this plan would optimize adult and juvenile fish passage past Three Mile Dam. Additionally, operation and maintenance (O&M) costs have been noted in the EA, but a source for funding has not been identified. We suggest a source for O&M funds be identified prior to construction of fish passage improvements.

Thank you for the opportunity to comment on this project. NMFS has been an active participant in the development of fish passage improvements at Three Mile Dam and hopes to continue participating throughout the design phase. Please direct further information or questions to Randy Lee at FTS 429-5411 or commercial (503) 230-5411.

Sincerely,

Dale R. Evans

Dale R. Evans
Division Chief

cc: ODFW, Portland and Pendleton
NPPC
USFWS, Portland
CTUIR
BPA

Prior to construction, an O&M agreement will be developed between Reclamation and the Bonneville Power Administration (BPA). This agreement will identify the source of O&M funding.

Thank you for your review and comment.

DEPARTMENT OF THE ARMY
PORTLAND DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2946
PORTLAND, OREGON 97208

December 16, 1985

Planning Division (PL-NR-EQ)

Regional Director
Bureau of Reclamation
ATTN: 150
Box 043-550 West Fort Street
Boise, Idaho 83724

Dear Sir:

The Portland District, Corps of Engineers has reviewed the Environmental Assessment for the proposed fish passage improvements at Three Mile Falls Diversion Dam, Umatilla River, Oregon and has the following comments.

The proposed construction of the right bank ladder appears to involve inwater fill. It will be necessary to apply for a Corps of Engineers permit prior to project construction in order to comply with the requirements of Section 404(b) of the Clean Water Act.

A Section 404(b) permit will be applied for as soon as plans are finalized and prior to any construction activities.

Please contact our Regulatory Branch at the above address, ATTN: NPPOP-R, telephone (503) 221-6995 for additional information concerning permit requirements.

Thank you for the opportunity to review this Environmental Assessment.

Thank you for your review and comment.

Sincerely,

Eugene D. Poppino
for Patrick J. Keough, P.E.
Chief, Planning Division

IN REPLY REFER TO:
Fish and Wildlife

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Umatilla Agency
Post Office Box 520
Pendleton, OR 97801-0520

DEC 17 1985

Regional Director
Bureau of Reclamation
Attention: 150
Box 043-550 West Fort St.
Boise, Idaho 83724

Dear Sir:

In response to your request to review the Environmental Assessment for the Proposed Fish Passage Improvements at Three Mile Falls Diversion Dam Umatilla River, Oregon, we are providing the following comments. They are provided on a technical assistance basis only and do not necessarily represent the position of the Secretary of Interior.

We support the proposed action, Alternative A, as the best means of solving anadromous fish passage problems at Three Mile Falls Diversion Dam. Passage improvements for anadromous fish at this dam are critical to the success of the Confederated Tribes/Oregon Department of Fish and Wildlife Umatilla Basin salmon and steelhead restoration program. Even though the proposed action's construction operation and maintenance costs are higher than some of the other alternatives, it seems to offer the most versatility for operation, trapping and counting.

Specific comments follow:

Page 1, Paragraph 2 - An early hydroelectric project on the Umatilla River constructed in 1910 probably adversely impacted salmon. In addition, main-stem Columbia River hydroelectric dams have a known chronic impact on steelhead.

This information has been incorporated in the paragraph cited.

Page 4, Paragraph 2 - We concur with the Confederated Tribes position that the intent if not the letter of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program mandates that BPA fund construction and operation and maintenance of fish passage improvements on the Umatilla River.

Please refer to earlier response to a similar comment in the National Marine Fisheries Service letter.

Specific rationale for this position include:

1. Early hydropower development on the Umatilla River adversely impacted salmon and steelhead.

2. Main-stem Columbia River hydropower projects have since 1938 annually impacted Umatilla steelhead.

3. Hydropower projects on the Columbia and Snake Rivers have eliminated forever tribal fishing opportunities in the Malheur, Burnt and Powder River drainages and severely reduced such opportunities in the Imnaha, Tucannon, Grande Ronde and John Day drainages. The reservoirs created by the dams on the Columbia and Snake Rivers also inundated traditional fishing sites.

4. The proposed Umatilla River rehabilitation program is the least-cost alternative available to begin addressing the federal government's responsibilities to the tribes under the 1855 treaty and BPA's responsibility under the power act.

5. Umatilla Basin irrigation districts built and maintain the fish passage facilities required of them by the state. They should not be required to build or maintain facilities designed to mitigate for hydropower impacts.

   The irrigation districts should be required to continue to pay steelhead O & M at the present level, but that all other costs would be picked up by the ratepayers as partial mitigation for impacts of construction and operation of the federal Columbia River power system (FCRPS).

Page 7, Paragraph 2 - Additional spring chinook holding pools will be provided if determined to be a limiting factor in utilization of productive spawning and rearing areas.

This information has been added to the paragraph cited.

Page 22, Paragrpah 2 - Ibid.

The paragraph cited on page 22 refers to steelhead.

Page 25 Item d - Consequences of no action include:

1. Diminished ability of the Confederated Tribes and Oregon Department of Fish and Wildlife to meet salmon and steelhead production goals.

2. Reduce benefits for anadromous fish accruing from other Umatilla River rehabilitation measures.

3. Increased Indian non-Indian tension and potential for legal conflict given lack of alternative ways of complying with the federal governments treaty obligations.

These consequences have been incorporated in the paragraph cited.

Page 30, Paragraph 2 - The proposed action is a critical feature in the Confederated Tribes/Oregon Department of Fish and Wildlife Umatilla Basin salmon and steelhead restoration program that will:

1. Significantly increase benefits of other Umatilla Basin rehabilitation measures.

2. Begin to address the obligation and pay a small portion of the federal government's and region's ratepayers' debt to the tribes and other fishermen impacted by the FCRPS.

3. Contribute to Indian and non-Indian fisheries from the headwaters of the Umatilla to Southeast Alaska.

4. Reduce socially destructive tension between Indian and non-Indian people of the Umatilla River Basin and contribute to lessening of tension between Indian and non-Indian fishermen regionwide.

5. Create the opportunity for tribal ceremonial and subsistence fisheries and fish-related employment and economic development.

6. Stimulate badly needed non-Indian economic diversity, i.e., recreation and tourism, by creating major salmon and steelhead runs in the heart of eastern Oregon's most populous country.

Thank you for the opportunity to comment on this document.

Sincerely,

William A. Cardoval

Superintendent

cc: Area Director

The issues cited are considered important elements of the need for fish passage improvements at Three Mile Falls Diversion Dam.

Thank you for your review and comments.

GENERAL COUNCIL
and
BOARD of TRUSTEES

CONFEDERATED TRIBES
of the
Umatilla Indian Reservation

P.O. Box 638
PENDLETON, OREGON 97801
Area Code (503) Phone 276-3165

Douglas James
Bureau of Reclamation
Federal Bldg. & U.S. Courthouse
Box 043-550 W. Fort St.
Boise, ID 83724

Dear Mr. James:

The following are comments of the Confederated Tribes of the Umatilla Indian Reservation regarding the environmental assessment of proposed fish passage improvements at Three Mile Dam Falls Diversion Dam.

As a general comment, we support the said modifications and favor the proposed two-ladder alternative as indicated in our March 15, 1985 letter to you. Timely completion of this high priority project is critical to the success of the Tribal/State Umatilla Basin salmon and steelhead restoration program. We concur that implementation of the proposed action will have insignificant negative environmental impacts. The modifications are indeed designed to result in positive environmental consequences which will enhance fishery resources in the Umatilla Basin.

It seems somewhat ironic to examine the environmental impacts of improving a structure which has probably had the most negative impact on fisheries resources ever in the Umatilla Basin. Its unfortunate that this level of environmental analysis was not conducted prior to construction of Three Mile Dam.

Specific tribal comments follow:

Page 1, para. 2 - Add statement - An early hydro project on the Umatilla River constructed in 1910 was also a probable salmon impact and steelhead have also been affected by main-stem Columbia River hydro projects.

Please see response to similar comment on the first page of the letter from the Bureau of Indian Affairs.

Douglas James, cont.

Page 3, para. 1 - Fall chinook sub-yearling migrants would experience higher mortality at the existing louver than would steelhead smolts.

The paragraph cited has been modified accordingly.

Page 3, para. 4 - Omit "and fall chinook" at end of sentence.

Earlier discussions did include fall chinook, and the reference has been retained but modified slightly.

Page 4, para. 2 - Although operation and maintenance issue is stated as unresolved, the Tribe feels the intent of this measure in the Fish and Wildlife is clear: BPA would fund construction and O & M of fish passage improvements on the Umatilla River. The rationale for BPA fundings includes consideration of the following:

1) Early hydropower development on the Umatilla River adversely impacted salmon and steelhead.

2) Main-stem Columbia River hydropower projects have since 1938 annually impacted Umatilla steelhead.

3) Main-stem Columbia River hydropower projects have eliminated forever tribal fishing opportunity in the Malheur, Burnt and Powder River drainages. Eliminated it for the foreseeable future in the Imnaha, Tucannon, Grande Ronde, and John Day drainages. Eliminated traditional fishing sites on the main-stem Columbia and Snake Rivers.

4) The proposed Umatilla River rehabilitation program is the least-cost alternative available to begin addressing the federal government's responsibilities to the Tribes under the 1855 Treaty and BPA's responsibility under the Power Act.

5) Umatilla Basin irrigation districts built and maintain the fish passage facilities required of them by the State. They should not be required to build or maintain facilities designed to mitigate for hydropower impacts.

It is our view that the districts should be required to continue to pay steelhead O & M at the present level, but that all other costs would be picked up by the ratepayers as partial mitigation for impacts of construction and operation of the Federal Columbia River Power System (FCRPS).

Please refer to earlier response to a similar comment in the National Marine Fisheries Service letter.

Page 6, para. 2 - The steelhead enhancement plans were cooperatively developed by the Tribes and ODFW.

Paragraph has been revised to note Oregon Department of Fish and Wildlife (ODFW) participation.

Douglas James, cont.

Page 7, para. 2 - Additional spring chinook holding and rearing pools will be created as a part of the ongoing BPA instream habitat improvement program.

Comment incorporated in the cited paragraph.

Page 22, para. 8 - same comment.

The comment has not been added here because it was added earlier in the text (preceding comment), and the material on page 22 does not discuss specific details of CTUIR fish rehabilitation efforts.

Page 25, item d - delete everything after second sentence and add Table 24 from the ODFW comprehensive plan (see attachment) for a list of projects to be implemented in the Umatilla Basin.

The list of probable measures on page 23 has been replaced with the suggested table.

Page 27, para. 2 - The first priority for screen construction is protection of juvenile downstream migrants but overdesigning in excess of protective needs is not desirable because of potential silt deposition problems. To minimize deposition, the Tribe suggests the screens be sized for actual water usage during peak irrigation months or design operational versatility so that some screens could be sectioned off, thus the number of working screens would be in accordance with flows present.

Final design for the screens has not yet been selected. Hydrologic studies indicate that this capacity will be between 150 and 210 ft^3/s. The selected capacity will represent near maximum diversions under the present operation scenario. The screen structure would be built in such a way that it can be expanded to accommodate higher flows if the District choses to exercise its full water right at a future date. Siltation would likely be a problem in any case and would probably require annual removal.

Page 30, para. 2 - Add statement - The proposed action is a critical feature in the overall rehabilitation plan that will:

1) Significantly increase benefits of other Umatilla Basin rehabilitation measures.

2) Begin to address the obligation and pay a small portion of the federal government's and region's ratepayers' debt to the tribes and other fishermen impacted by the FCRPS.

3) Contribute to Indian and non-Indian fisheries from the headwaters of the Umatilla to SE Alaska.

4) Reduce socially destructive tension between Indian and non-Indian people of the Umatilla River Basin and contribute to lessening of tension between Indian and non-Indian fishermen regionwide.

5) Create the opportunity for tribal ceremonial and subsistence fisheries and fish-related employment and economic development.

6) Stimulate badly needed non-Indian economic diversity, i.e., recreation and tourism, by creating major salmon and steelhead runs in the heart of eastern Oregon's most populous county.

The benefits cited have not been incorporated in the EA text but are important aspects of the need for fish passage improvements at Three Mile Falls Diversion Dam. Please refer to the earlier response to similar comment in the Bureau of Indian Affairs letter.

Douglas James, cont.

In summary, we agree that insignificant negative environmental impacts would result from the Three Mile Dam modification project. We urge the Bureau of Reclamation to wrap up the environmental process and quickly move towards completion of the final designs and implementation. The first salmon runs have already returned to the Umatilla and more are expected in the years to come.

Thank you for the opportunity to comment.

Sincerely,

Ken Hall

Ken Hall, Chairman
Board of Trustees

Attachment

Copy to: Fish and Wildlife Committee
Boyce, Phelps - ODFW
Dompier - CRITFC

Table 24. Umatilla River fishery rehabilitation plan FY 1986-90 -- priorities and schedules for implementation.

FW Program Reference	Project	Five-Year Schedule Fiscal Year 1986	1987	1988	1989	1990
	Fishery Rehabilitation Projects					
704(i)(1)	1. Hatchery facility for 200K summer steelhead	+	0			
704(g)(2)	2. Spring chinook reintroduction and broodstock development	+	0			
704(d)(1) Table 2	3. Three Mile Falls upstream and downstream passage improvement	+	0			
	4. Adult and smolt trapping/trucking program	+	0			
	5. Westland upstream and downstream passage improvement and smolt trapping facility	+	+	0		
	6. Cold Springs upstream and downstream passage improvement			+	0	
	7. Maxwell and Stanfield upstream and downstream passage improvement				+	0
	8. Small diversions downstream passage improvement					
	a. Brownell and Dillon	+	0			
	b. Umatilla River unscreened diversions (5)		+	0		
	c. Birch Creek unscreened diversions (11)			+	0	
	9. Habitat improvement					
	a. Meacham and North Fork Meacham Creeks	+	+	0		
	b. South Fork Umatilla River Thomas Creek	+	+	0		
	c. Mainstem Umatilla River (Meacham Creek to Forks)	+	+	+	0	
	d. North Fork Umatilla River			+	0	
	e. Squaw Creek			+	0	
	f. Birch and East and West Fork Birch Creeks			+	+	0
	Flow Enhancement Projects					
704(d)(2)	1. McKay Storage Plan	0				
	2. Bureau of Reclamation's CRP or CRP/Meacham Dam Plans	+	+	+	+	0

Thank you for your review and comments.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
BUILDING 602, CITY-COUNTY AIRPORT
WALLA WALLA, WASHINGTON 99362-9265

REPLY TO
ATTENTION OF:

January 6, 1986

Planning Division

Mr. Douglas J. James
Acting Regional Environmental Director
Bureau of Reclamation
Pacific Northwest Region
Federal Building and U.S. Courthouse
Box 043-550 West Fort Street
Boise, Idaho 83724

Dear Mr. James:

This letter is in response to your Draft Environmental Impact Statement (DEIS) concerning the Three Mile Falls Diversion Dam project that you sent to our District. The document was forwarded to the Environmental Resources Branch for review. This letter also reflects the previous discussion between you and Mr. W. E. McDonald concerning this proposal.

We have reviewed the DEIS for the Three Mile Falls Diversion Dam project near Umatilla, Oregon. Our review does not reveal any effects on navigation or hydropower development. Moreover, we have reviewed the project for flood control and hydrologic concerns and found no inadequacies.

In regard to Section 404 permits, you have indicated that you will be coordinating with our Regulatory Functions Branch to insure compliance with permit procedures. We will provide the necessary information concerning the permitting procedures as the application is processed.

We look forward to working with you as a cooperating agency. Should you need any additional information, please contact Mr. W. E. McDonald at (509) 522-6627 or FTS 434-6627.

Sincerely,

L. V. Armacost
Chief, Planning Division

A Section 404(b) permit will be applied for as soon as plans are finalized and prior to any construction activities.

Thank you for your review and comment.

VICTOR ATIYEH
GOVERNOR

Department of Fish and Wildlife

506 SW MILL STREET, P.O. BOX 59, PORTLAND, OREGON 97207

January 9, 1986

Mr. Douglas J. James
Bureau of Reclamation
Federal Bldg. and US Courthouse
Attention: 150, Box 043-550
West Fort Street
Boise, ID 83724

Dear Mr. James

The Oregon Department of Fish and Wildlife has reviewed the EA for fish passage improvements at Three Mile Falls Dam and submits the following comments. Our primary concern involves design criteria for fish screens for the West Extension Irrigation District (WEID) Canal.

1. Design criteria should be modified to accommodate 130 cfs which is the average flow in the canal (1974-83) during April-June, the peak months of downstream migration.

   Please refer to the earlier response to a similar comment in the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) letter, fourth comment on page 3.

2. Rotary drum screens should be designed to operate at all flows during April-June with 2/3 to 3/4 submergence of screens.

   These criteria are standard practice and will be incorporated into the design.

3. Orientation of screens in the canal should not exceed 15°.

   The angle of screen orientation in the canal will be selected to provide proper hydraulic relationships.

   These design modifications will achieve optimum fish bypass efficiencies during peak outmigration periods and will result in reduced trash accumulation problems and reduced need for bypass and pumpback water capacity.

   In the event average flows into the canal are greatly increased for hydroelectric or other development after the BR renovates the facility, the developer will be responsible for constructing screens appropriate for any changed conditions.

Other comments on the project are listed below.

Page

1. Need to state that the tribes and fish and wildlife agencies have given improvements at Three Mile Dam top priority in the Umatilla Rehabilitation Plan.

   This information has been added to page 1 in the fourth paragraph.

3. The WEID Canal louver poses the greatest danger to fall chinook. Fall chinook will be migrating at a smaller (fingerling) size and migrations may extend well into the summer low flow period when a high percentage of juveniles would be diverted into the canal.

Please refer to the earlier response to a similar comment in the Bureau of Indian Affairs letter.

4. We agree with the NMFS letter of December 10, 1985, that the source of funding for operation and maintenance (O&M) must be identified. Since this project is off-site mitigation for hydroelectric impacts, we believe that the federal government is responsible for providing O&M as it has been in all previous mitigation efforts.

Please refer to response to the similar comment in the National Marine Fisheries Service letter.

4. Capacity of the WEID Canal is 210 cfs and average use April-June (peak months of downstream migration) is only 130 cfs based on data for the last 10 years.

The original design capacity of the WEID canal was about 370 ft^3/s. Present capacity is about 210 ft^3/s due to some obstructions at certain points in the canal. These could be repaired and capacity increased if the need arises for higher diversions. Daily diversion records for the last 15 to 20 years are being reviewed to determine appropriate design capacities. Please refer to the earlier response to a similar comment in the CTUIR letter.

6. Results of passage studies in the lower Umatilla River channel are now available. Contact ODFW Columbia River Research.

The results of the passage studies in the lower Umatilla River will be utilized in final design activities.

6. Should update all fishery escapement objectives with figures appearing in the June 1985 draft of the Umatilla Rehabilitation Plan (final draft will be available early in 1986).

Appropriate changes have been made in the EA.

13. We assume the bypass would incorporate vertical slot design. This should be specified.

Appropriate changes have been made in the EA.

13. Explanation on operation of ladders at low flows is unclear. Suggested revision: During low flows, when there is insufficient flows to operate both ladders satisfactorily and the spill over the crest causes fish to be attracted to the right (east) ladder, only the right bank ladder will be operational. If there is no flow over the crest, only the left (west) bank ladder will be operational.

During low river flows, the ladders will be operated to provide the best passage conditions possible. This will require using only one ladder under certain flow conditions. The decision on which ladder to operate at any one time would be made in the field based on observed flow characteristics and fish movement. It was the desire of the fishery agencies in choosing the two-ladder option to maintain a degree of flexibility in the management of fish passage at Three Mile Falls Diversion Dam.

22. Fall and spring chinook production objectives - again, update using figures in June 1985 Draft Umatilla Rehabilitation Plan.

Appropriate changes have been made in the EA.

22. A return of 1,125 fall chinook is anticipated from release of 225,000 smolts assuming a 0.5% smolt-adult survival.

Appropriate changes have been made in the EA.

22. Holding pools for spring chinook are proposed in the Rehabilitation Plan. Even with these pools, the potential for sustaining natural populations of spring chinook is limited (we estimated production capacities of 582-1,166 adults depending on flow) due to low late summer flows in the upper Umatilla.

Appropriate changes have been made in the EA.

23. Ultimate production figures should be updated with revised estimates in the June 1985 draft Rehabilitation Plan. Also, these estimates assume completion of habitat improvements in Meacham Creek and trucking of smolts during years of low flow.

Appropriate changes have been made in the EA.

25. Items listed under No Action should be modified.

Please refer to earlier response to a similar comment in CTUIR's letter.

- -- ODFW/Tribes will continue release of 225,000 yearling brights from Bonifer.
- -- Minthorn Springs facility was completed in 1985.
- -- Site investigations for the 200 K summer steelhead hatchery were completed early in 1985.
- -- Fish screens will also be installed on four unscreened diversions on the main stem Umatilla under the Columbia River Fisheries Development Program (CRFDP). Also, Brownell and Dillon screens will be replaced under CRFDP.
- -- All instream and riparian habitat improvements proposed for the basin (see Table 16 in June 1985 Rehabilitation Plan) will be completed.

Thank you for the opportunity to comment on this project.

Thank you for your review and letter of comment.

Sincerely,

Harry Wagner

Harry Wagner
Chief of Fisheries

rw
c James (CTUIR)
Esch (NMFS)
Garst (FWS)
Chaney
Korn
Willis
Boyce
Schumacher
Carnegie
Phelps
Fredd
Faast

OREGON INTERGOVERNMENTAL PROJECT REVIEW

State Clearinghouse
Intergovernmental Relations Division
155 Cottage Street N. E.
Salem, Oregon 97310

Umatilla County

Phone (503)378-3732 or Toll Free in Oregon 1-800-422-3600

STATE AGENCY REVIEW

Project Number OR 851202-001-4 Return Date: DEC 27 1985

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

PROGRAM REVIEW AND COMMENT

TO STATE CLEARINGHOUSE: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

( ) It has adverse effects. (Explain in Remarks Section.)

( ) We are interested but require more information to evaluate the proposal. (Explain in Remarks Section.)

(X) Additional comments for project improvement. (Attach if necessary.)

RECEIVED
DIVISION OF STATE LANDS

REMARKS (Please type or print legibly)

The proposed fish passage improvements at Three Mile Falls Dam will require a removal permit from the Divisiom of State Lands if over 50 cubic yards of material are removed or altered within the Umatilla River. We would like to offer our support and cooperation in improving and restoring the anadromous fish resources in the Umatilla River.

The Bureau will prepare the information necessary and obtain required permits prior to any construction activity.

Thank you for your review and comment.

Agency Lands By Wm Parks

IPR #2 Phone Number 8-384

VICTOR ATIYEH
GOVERNOR

Department of Fish and Wildlife

506 SW MILL STREET, P.O. BOX 59, PORTLAND, OREGON 97207

January 17, 1986

Mr. Douglas J. James
Bureau of Reclamation
Federal Bldg. and US Courthouse
Attention: 150, Box 043-550
West Fort Street
Boise, ID 83724

Dear Mr. James:

The Oregon Department of Fish and Wildlife would like to submit the following comments which supplement our previous comments (January 9 letter) on the EA for fish passage improvements at Three Mile Falls Dam. We feel the project at Three Mile Falls Dam should include specifications and costs of fish hauling equipment to truck adults from the dam. The reason for including this equipment in the Three Mile Falls Project is adults may have to be trucked from the dam when the project is completed (FY 1988). At projected releases of 225,000 yearling and 3 million subyearling (spring and fall release) fall chinook and 400,000 subyearling (spring and fall release) spring chinook beginning in FY 1986, over 3,500 salmon could return to the Umatilla during FY 1988. If low fall or spring flows predominate, we may need to truck a substantial number of these fish from Three Mile Falls to above Stanfield Dam. As shown in the June 1985 draft of the Umatilla Rehabilitation Plan (see Table D18), we estimate that only about 40% of fall chinook and 70% of spring chinook would survive between Three Mile Falls and Stanfield Dams under present flow conditions without trucking. Fewer would survive during drought years. The 365 gallon units currently used in the Umatilla to transport smolts and small numbers of adults would not be adequate under these circumstances.

We have determined (see June 1985 draft of the Umatilla Plan) that a 2,500 gallon unit will be needed to haul present and future numbers of adults from Three Mile Falls Dam. We recommend that it is similar in design to the fish truck recently purchased by ODFW for Willamette River hatcheries. The unit has a 4-compartment stainless steel tank that is mounted on the bed of a diesel-powered truck. The unit has a refrigeration system, an oxygen system, a replacement main motor pump and an auxiliary pump to provide safe transport of fish. Adults could be easily loaded into the truck with the trapping/loading facilities designed for the East and West ladders. Capital cost of the unit is $130,000 and annual O&M is $14,100.

The Bureau of Reclamation's responsibility has been to coordinate the planning, design, and construction of fish passage improvements at Three Mile Falls Diversion Dam. The purchase of fish hauling equipment as proposed in this letter would not appear to be an appropriate action for the Bureau to undertake within those responsiblities. Additional fishery management needs, such as proposed here by the Oregon Department of Fish and Wildlife, that are determined to be essential by the fishery management entities within the basin (Confederated Tribes, Federal agencies, ODFW, etc.) would need to be presented for separate funding.

The immediate need for the 2,500 gallon unit is to haul adults from Three Mile Dam. Eventually this unit will also be used to haul smolts from Bonneville and Umatilla River Summer Steelhead hatcheries and to haul smolts from the proposed trapping facility at Westland during years of low flow.

Larry Korn (229-5439) or I (229-5440) would be happy to answer any questions you may have.

Sincerely,

Harry Wagner
Chief of Fisheries

rw
c James (CTUIR)
Esch, Rainey (NMFS)
Garst (FWS)
Chaney
Korn
Willis
Boyce
Schumacher
Carnegie
Phelps
Fredd
Faast

Thank you for your additional comments.

Nici Howland, ECN, x4090, 5th Floor, 1500 Bldg.

U.S. Department of Energy
Bonneville Power Administration
PO Box 3621
Portland, OR 97208
CGIR-911B

4/4 Environmental Assessments BPA/EQ-13 Permanent

EQ-13-2 EA-Water Budget 1983-86
EQ-13-2 EA/FONSI-Water Budget 1983
EQ-13-2 EA/FONSI-Water Budget 1984
EQ-13-2 EA-Yakima River Basin 1984
EQ-13-2 EA-Yakima River Basin Passage Facility 1983-84
EQ-13-2 EA-WNP-3 Lawsuit Settlement 1985-86
EQ-13-2 EA-Yakima River Basin 1984
EQ-13-2 McMinnville Area Support Trans. Project 1989
EQ-13-2 EA-Rock Creek 1988-89
EQ-13 EA-1971-75
EQ-13 EA-1974-77
EQ-13 EA-Surcharge Policy 1988

BPA F 1324.07e

Electronic Form Approved by CGIR xx/xx/95.

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
RECORDS TRANSFERRED TO RECORDS STORAGE

OFFICE SYMBOL	ORIGINATING OFFICE	CUSTODIAN OF RECORDS	DATE TRANSFERRED
ECN	Environmental Analysis	Nici Howland	95/08/04

ACCESSION NUMBER	LOCATION OR SPACE NUMBER	BPA BOX NUMBER

DESCRIPTION OF RECORDS

4/4

~~EQ-13-2 EA-Water Budget 1983-86~~
EQ-13-2 EA/FONSI-Water Budget 1983
EQ-13-2 EA/FONSI-Water Budget 1984
EQ-13-2 EA-Yakima River Basin 1984
EQ-13-2 EA-Yakima River Basin Passage Facility 1983-84
EQ-13-2 EA-WNP-3 Lawsuit Settlement 1985-86
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EQ-13-2 McMinnville Area Support Trans. Project 1989
EQ-13-2 EA-Rock Creek 1988-89
EQ-13 EA-1971-75
EQ-13 EA-1974-77
EQ-13 EA-Surcharge Policy 1988