Fish Passage Center

Columbia Basin Fish and Wildlife Authority

Annual Report
1990

DOE/BP-38906-19

May 1991

This Document should be cited as follows:

DeHart, Michele, "Fish Passage Center; Columbia Basin Fish and Wildlife Authority ", 1990 Annual Report, Project No. 198712700, 6 e-pages in TOC file, (BPA Report DOE/BP-38906-19)

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

This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

FISH PASSAGE CENTER

ANNUAL REPORT

1990

This report responds to the Fish Passage Center annual reporting requirements to the Northwest Power Planning Council under its Columbia River Basin Fish and Wildlife Program, and the annual reporting requirements to the Bonneville Power Administration under its funding contracts which supported this work.

BPA PROJECT NO. 87-127

Michele DeHart
Fish Passage Center Manager

FISH PASSAGE CENTER
of the
Columbia Basin Fish & Wildlife Authority
2501 S.W. First Ave., Suite 230
Portland, Oregon 97201-4752

May, 1991

This report has been separated into multiple pdf files so the viewer may easily access and download the smaller files through the links contained in this Table of Contents document.

CLICK HERE TO DOWNLOAD THE COMPLETE 115 MB PDF FILE

TABLE OF CONTENTS

Page

List of Figures iv
List of Tables v
Acknowledgments vi
Executive Summary vii

I. INTRODUCTION 1
II. 1990 WATER BUDGET FLOW AUGMENTATION 2
A. The 1990 Water Budget Coordinated Plan of Operation (CPO) 2
1. Negotiating the 1990 Water Budget CPO 3
2. The Final 1990 Water Budget CPO 5
B. 1990 Runoff 5
1. Runoff Volumes 6
2. Runoff Forecasts 6
C. 1990 Water Budget Implementation Chronology 10
Week 1: April 16 - 22 10
Week 2: April 23 - 29 13
Week 3: April 30 - May 6 18
Week 4: May 7 - May 13 20
Week 5: May 14 - May 20 22
Week 6: May 21 - May 28 24
Week 7: May 29 - June 3 26
Week 8: June 4 - June 10 28
Week 9: June 11 - June 15 30

III. 1990 SPILL IMPLEMENTATION 32
A. Spill Planning 32
B. Spill Implementation 33
1. Spill at Lower Monumental Dam 33
2. Spill at Ice Harbor Dam 35
3. Spill at John Day Dam 36
4. Spill at The Dalles Dam 38
5. Spill at Bonneville Dam 41
C. Summary 42

IV. 1990 SMOLT MONITORING PROGRAM 44
A. Passage Indices 44
B. Migration Timing 50
C. Travel Time 55

V. 1990 HATCHERY RELEASES 72

VI. 1990 ADULT FISH PASSAGE 74

VII. CITED REFERENCES 77

APPENDIX A: 1990 Water Budget Coordinated Plan of Operation A-1
APPENDIX B & C: . . . . . Omitted
APPENDIX D: Confidence Intervals for 1990 Passage Indices D-1
APPENDIX E: 1990 Smolt Migration Timing Plots E-1
APPENDIX F: 1990 Migration Timing Plots for Marked Smolts of Hatchery Origin F-1
APPENDIX G: Detailed Travel Time Tables G-1
APPENDIX H: 1990 Migration Timing Plots and Smoltification Development (ATPase) Plots H-1
APPENDIX I: 1990 Columbia River Hatchery Releases I-1
APPENDIX J: 1990 Brand Releases J-1
APPENDIX K: Comments on Draft Annual Report & FPC Responses K-1

FIGURES

Page

1. 1990 Forecasted and observed runoff volumes, and the 25-year average, in the mid-Columbia, Snake, and lower Columbia River reaches 9

2. 1990 Reservoir elevations and Water Budget use days 12

3. 1990 Smolt indices, flows, and Water Budget use days 14

4. 1990 River temperatures at key hydroelectric projects 15

5. Daily average flow (DAF) and spill at Lower Monumental Dam compared to 35% of DAF 34

6. Daily average flow (DAF) and spill at Ice Harbor Dam compared to 12.5% of DAF 36

7. Daily average flow (DAF) and spill at John Day Dam compared to 8.33% of DAF 37

8. Daily average flow (DAF) and spill at The Dalles Dam compared to 10% (spring) and 5% (summer) of DAF 40

9. Daily average flow (DAF) and spill at Bonneville Dam compared to 49% (spring) and 44% (summer) of DAF 41

10. Comparison of average ATPase level of yearling chinook arriving at Clearwater and Snake River traps, and estimated median travel time from there to Lower Granite Dam, 1990 59

11. Median travel time to flow relations for yearling chinook and steelhead (marked at Idaho traps) in the Lower Granite reservoir index reach, 1990 61

12. Comparison of average ATPase level of steelhead arriving at the Snake River trap, and estimated median travel time from there to Lower Granite Dam, 1990 62

13. Comparison of the "at time of marking" fork lengths between released Dworshak Hatchery steelhead and those individuals recovered at Lower Granite Dam for the hatchery's three water systems, 1990 64

14. Median travel time to flow relations for yearling chinook (marked at Idaho traps) in the Lower Granite to McNary Dam index reach, 1990 66

15. Comparison of average ATPase level of yearling chinook arriving at Rock Island Dam, and estimated median travel time from there to McNary Dam, 1990 68

16. Comparison of average ATPase level of steelhead arriving at Rock Island Dam, and estimated median travel time from there to McNary Dam, 1990 69

17. Passage of adult salmonids at Bonneville Dam 1980-1990 76

18. Passage of adult upriver bright fall chinook at McNary Dam, and escapement of adult tule fall chinook to Spring Creek Hatchery, 1980-1990 76

TABLES

Page

1. January-July runoff comparisons 6

2. 1990 Forecasted vs. average (1961-85) January-July runoff 7

3. 1990 Observed vs. average (1961-85) monthly precipitation 7

4. 1990 Mid-Columbia Water Budget accounting and control point streamflows 16

5. 1990 Snake River Water Budget accounting 22

6. Gas bubble incidence observed on salmon and steelhead from May 31 - June 6, 1990 39

7. Seasonal totals of flow, spill, and spill due to overgeneration 43

8. Smolt monitoring sites for 1990 45

9. 1990 and historical annual passage indices for juvenile salmonids at key monitoring sites 46

10. Hatchery and wild steelhead passage indices for 1990 compared to 1989 at key monitoring sites 48

11. 1990 and historical passage dates for juvenile salmonids at key monitoring sites. 52

12. Hatchery and wild steelhead passage dates for 1990 compared to 1989 at key monitoring sites 54

13. Average travel time from Snake River and Clearwater River traps to Lower Granite Dam, 1990, stratified by 20-kcfs flow intervals 57

14. Travel time of marked fish in key index reaches, 1990 65

15. Summary of hatchery releases by species and release area for 1989 and 1990 73

16. A Comparison of Columbia River adult fish counts at Bonneville, McNary, Ice Harbor and Priest Rapids dams for calendar years 1989 and 1990, and the 10-Year Average (1980-1990) 75