Lower Snake River Juvenile Salmon Migration Feasibility Report and Environmental Impact Statement (Final FR/EIS)

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Record of Decision:	At least 45 days after publishing the Notice of Availability of the Final FR/EIS in the Federal Register, the Corps will prepare a Record of Decision documenting the action resulting from the Feasibility Study process.

Abstract:

The Corps of Engineers, along with the Bonneville Power Administration, U.S. Environmental Protection Agency, and U.S. Bureau of Reclamation as cooperating agencies, analyzed four general alternatives intended to provide information on the technical, environmental, and economic effects of actions related to improving juvenile salmon passage. The four alternatives include Alternative 1—Existing Conditions (the no-action alternative) and three different ways to further improve juvenile salmon passage. The action alternatives are as follows: Alternative 2—Maximum Transport of Juvenile Salmon; Alternative 3—Major System Improvements; and Alternative 4—Dam Breaching. Based on a thorough examination of the best available biological, economic, social, and other environmental information, Alternative 3—Major System Improvements has been selected as the recommended plan (preferred alternative).

Lower Snake River Juvenile Salmon
Migration Feasibility Study

Final Feasibility Report/ Environmental Impact Statement

Part I
Chapters 1 through 4

February 2002

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APPENDICES (Bound Separately)

*APPENDIX S, LOWER SNAKE RIVER MAPS, IS BOUND SEPARATELY (OUT OF ORDER) TO ACCOMMODATE A SPECIAL 11 X 17 FORMAT.

Figures

Tables

Acronyms and Abbreviations

λ	(lambda) population growth rate
°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
ACHP	Advisory Council on Historic Preservation
ADP	acoustic Doppler profiler
AET	apparent effects threshold
AIRFA	American Indian Religious Freedom Act
AMPA	aminomethylphosphoric acid
aMW	average megawatt
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
BGS	behavioral guidance structure
BIA	Bureau of Indian Affairs
BKD	bacterial kidney disease
BLM	Bureau of Land Management
BNSF	Burlington Northern – Santa Fe Railroad
BOD	biochemical oxygen demand
BOR	U.S. Bureau of Reclamation
BOT	Board of Trustees
BP	before present
BPA	Bonneville Power Administration
BSM	Bayesian Simulation Model
CAA	Clean Air Act
CBB	Columbia Basin Bulletin
CBFWA	Columbia Basin Fish and Wildlife Authority
CC	combined-cycle combustion
CCAP	U.S. Climate Change Action Plan
CCC	criteria continuous concentration
CEAA	Canadian Entitlement Allocation Agreement
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations
cfs	cubic feet per second

Acronyms and Abbreviations (continued)

CH_4	methane
CLR	Columbia River Mile
CMC	criteria maximum concentration
CO	carbon monoxide
CO_2	carbon dioxide
Comp Plan	Lower Snake River Fish and Wildlife Compensation Plan
Corps	U.S. Army Corps of Engineers
CR	County Road
CRBG	Columbia River Basalt Group
CRFMP	Columbia River Fish Mitigation Program
CRI	Cumulative Risk Initiative
CRITFC	Columbia River Inter-Tribal Fisheries Commission
CRMP	Cultural Resources Management Plan
CSPE	Columbia Storage Power Exchange
CTCIR	Confederated Tribes of the Colville Indian Reservation
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CWA	Clean Water Act
DDT	dichloro-diphenyl-trichloroethane
DGAS	Dissolved Gas Abatement Study
DMEF	Dredged Material Evaluation Framework
DO	dissolved oxygen
DREW HIT	Drawdown Regional Economic Workgroup Hydropower Impact Team
DREW	Drawdown Regional Economic Workgroup
DSI	direct service industries
Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EQ	environmental quality
ESA	Endangered Species Act
ESBS	extended submerged bar screen
ESL	Endangered Species List
ESU	Evolutionarily Significant Unit
EWITS	Eastern Washington Intermodal Transportation Study
FCRPS	Federal Columbia River Power System

Acronyms and Abbreviations (continued)

Feasibility Study	Lower Snake River Juvenile Salmon Migration Feasibility Study
FELCC	firm energy load-carrying capacity
FERC	Federal Energy Regulatory Commission
FGE	fish guidance efficiency
FIRE	finance, insurance, and real estate
FIRFA	Federal Insecticide, Fungicide, and Rodenticide Act
FPC	Fish Passage Center
FPE	fish passage efficiency
FPOM	Fish Passage Operations and Maintenance Coordination Team
FR	Federal Register
FR/EIS	Lower Snake River Juvenile Salmon Migration Study Feasibility Report and Environmental Impact Statement
ft/sec	feet per second
FTE	full-time equivalent
FTU	Formazin Turbidity Unit
FWCA	Fish and Wildlife Coordination Act
FWCAR	Fish and Wildlife Coordination Act Report
GBD	gas bubble disease
GBT	gas bubble trauma
GHG	greenhouse gas
GIS	geographic information system
GSA	General Services Administration
HCFC	partially halogenated fluorocarbons
HEP	Habitat Evaluation Procedures
HIT	Hydropower Impact Team
HMU	habitat management unit
HTRW	hazardous, toxic, or radioactive wastes
HU	habitat unit
HYDROSIM	Hydro Simulation Program
HYSSR	Hydro System Seasonal Regulation Program
ICBEMP	Interior Columbia Basin Ecosystem Management Project
IEAB	Independent Economic Analysis Board of the Northwest Power Planning Council

Acronyms and Abbreviations (continued)

IPP	Independent Power Producer
ISAB	Independent Scientific Advisory Board
ISG	Independent Scientific Group
ISRT	Integrated Scientific Review Team
IT	Implementation Team
JFTP	Juvenile Fish Transportation Program
KAF	thousand acre-feet
kcfs	thousand cubic feet per second
kg/m^2	kilogram per meter squared
KW	kilowatt
KWh	kilowatt hour
LOA	Letter of Agreement
LPMS	Lock Performance Monitoring System
LWCFA	Land and Water Conservation Fund Act
M&I	municipal and industrial
MAF	million acre-feet
mills/kWh	mils per kilowatt hour
mm	millimeter
MOP	minimum operating pool
msl	mean sea level
MW	megawatt
MWh	megawatt hour
N_2O	nitrous oxide
NAGPRA	Native American Graves Protection and Repatriation Act
NED	national economic development
NEPA	National Environmental Policy Act
Nez Perce	Nez Perce Tribe
NGVD29	National Geodetic Vertical Datum 1929
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NPPC	Northwest Power Planning Council
NPS	National Park Service
NPTEC	Nez Perce Tribe Executive Council

Acronyms and Abbreviations (continued)

NRHP	National Register of Historic Places
NTMB	neotropical migratory bird
NTU	nephelometric turbidity unit
O&M	operation and maintenance
O_3	ozone
OA	Columbia River Salmon Flow Measures Options Analysis
OSE	other social effects
PAH	polynuclear aromatic hydrocarbon
PATH	Plan for Analyzing and Testing Hypotheses
Pb	lead
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo dioxins
PCDF	polychlorinated dibenzo furans
PDO	Pacific Decadal Oscillation
PIT	passive integrated transponder
PM	particulate matter
PM_{10}	particulate matter with aerodynamic diameters less than 10 micrometers
PMOA	Programmatic Memorandum of Agreement
PNCA	Pacific Northwest Coordination Agreement
PNI	Pacific Northwest Index
ppb	parts per billion
ppm	parts per million
ppt	parts per trillion
PSEP	Puget Sound Estuary Program
PUD	Public Utility District
RCRA	Resource Conservation and Recovery Act
RED	regional economic development
RM	River Mile
ROCASOD	Record of Consultation and Statement of Decision
RPA	reasonable and prudent alternative
RSW	removable spillway weir
SAR	smolt-to-adult survival ratio
SBC	surface bypass collector
Scenic Area	Columbia River Gorge National Scenic Area

Acronyms and Abbreviations (continued)

SCS	System Configuration Study
SCT	System Configuration Team
SDWA	Safe Drinking Water Act
Shoshone-Bannock	Shoshone Bannock Tribes
SHPO	State Historic Preservation Office
SIA	social impact assessment
SNL	speed no load
SNR	Snake River Mile
SO_2	sulfur dioxide
SOR	System Operation Review
SR	State Route
SRP	Science Review Panel
STS	submerged traveling screen
SWI	simulated Wells Dam intake
TAP	toxic air pollutant
TCDD	tetra chloro dibenzo-p-dioxin
TCDF	2,3,7,8-tetra chloro dibenzo furan
TCM	Travel Cost Method
TCR	transport:control ratio
TDG	total dissolved gas
TDGMS	total dissolved gas monitoring station
TEQ	toxicity equivalency quotient
TIR	transport to in-river ratio
TKN	total Kjeldahl nitrogen
TMDL	Total Maximum Daily Load
TMT	Technical Management Team
TPH	total petroleum hydrocarbons
TPY	tons per year
TSCA	Toxic Substance Control Act
TSS	total suspended solid
TVA	Tennessee Valley Authority
UI	University of Idaho
Union Pacific	Union Pacific Railroad
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Acronyms and Abbreviations (continued)

VOC	volatile organic compound
WAC	Washington Administrative Code
Warm Springs	Confederated Tribes of the Warm Springs of Oregon
WCSC	Waterborne Commerce Statistics Center
WDFW	Washington Department of Fish and Wildlife
WQT	Water Quality Team
WRC	U.S. Water Resources Council
WRDA	Water Resources Development Act
WSCC	Western Systems Coordinating Council
WSU	Washington State University
WTP	willingness to pay
Yakama	Yakama Nation

ENGLISH TO METRIC CONVERSION FACTORS

To Convert From	To	Multiply By
LENGTH CONVERSIONS:		
Inches	Millimeters	25.4
Feet	Meters	0.3048
Miles	Kilometers	1.6093
AREA CONVERSIONS:		
Acres	Hectares	0.4047
Acres	Square meters	4047
Square Miles	Square kilometers	2.590
VOLUME CONVERSIONS:		
Gallons	Cubic meters	0.003785
Cubic yards	Cubic meters	0.7646
Acre-feet	Hectare-meters	0.1234
Acre-feet	Cubic meters	1234
OTHER CONVERSIONS:		
Feet/mile	Meters/kilometer	0.1894
Tons	Kilograms	907.2
Tons/square mile	Kilograms/square kilometer	350.2703
Cubic feet/second	Cubic meters/sec	0.02832
Degrees Fahrenheit	Degrees Celsius	(Deg F –32) x (5/9)

UNIT DEFINITIONS

parts per million (ppm) ≅ mg/L
parts per billion (ppb) ≅ µg/L
parts per trillion (ppt) ≅ ng/L