

Evaluation of the Removal of the Lower Snake River Dams

By James D. Barton, P.E.

U.S. Army Corps of Engineers

Portland, Oregon

Presentation Overview

- Background
- Study Process
- Results & Conclusions
- Summary
- Next Steps

Background

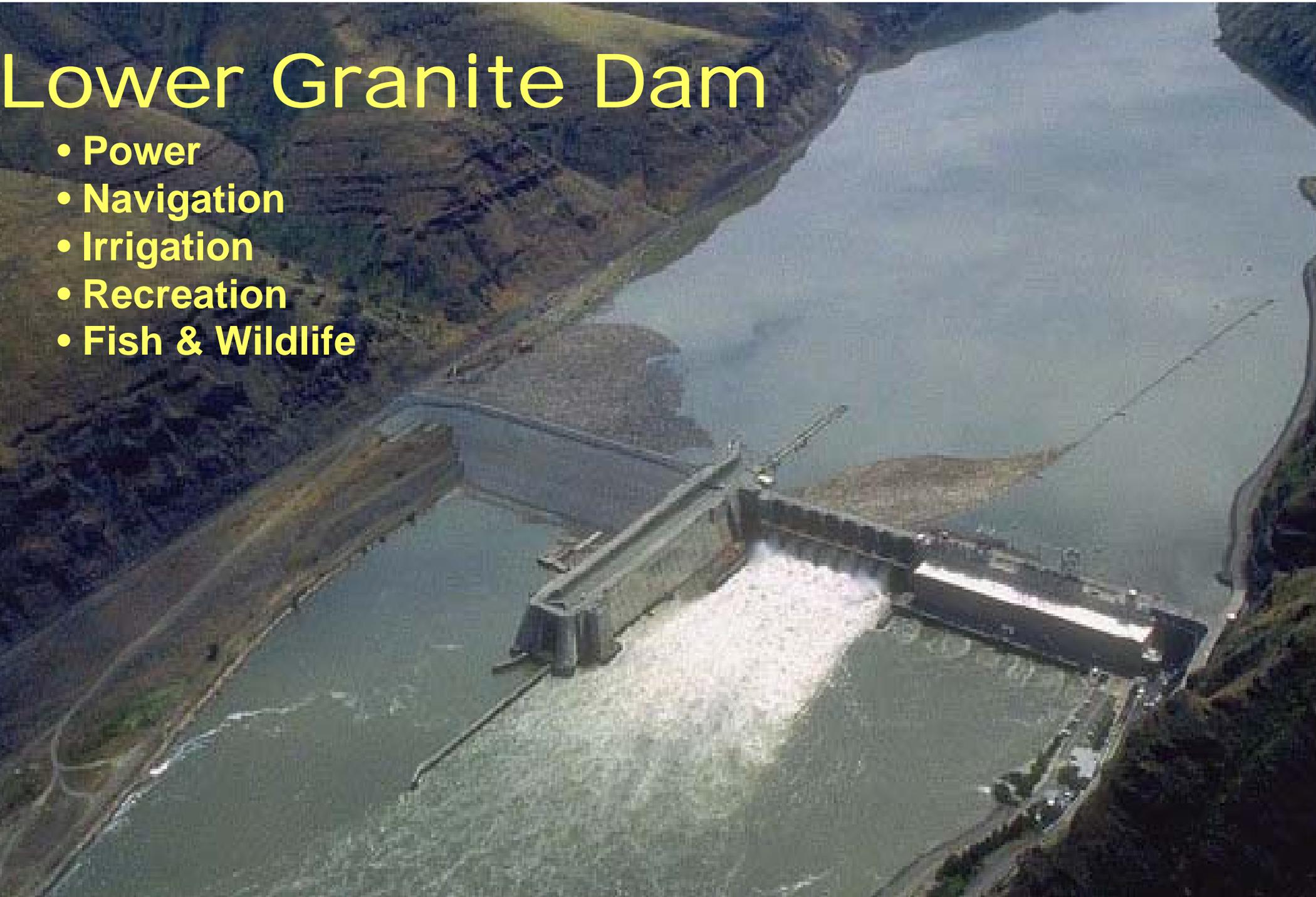
- **ESA listing of Salmon & Steelhead**
- **Lower Snake River Juvenile Salmon Migration Study**
- **Identify & Define Alternatives for Species Recovery**
- **Comprehensive Evaluation & Report**
- **Congressional Decision**

Lower Snake and Columbia Projects



Lower Granite Dam

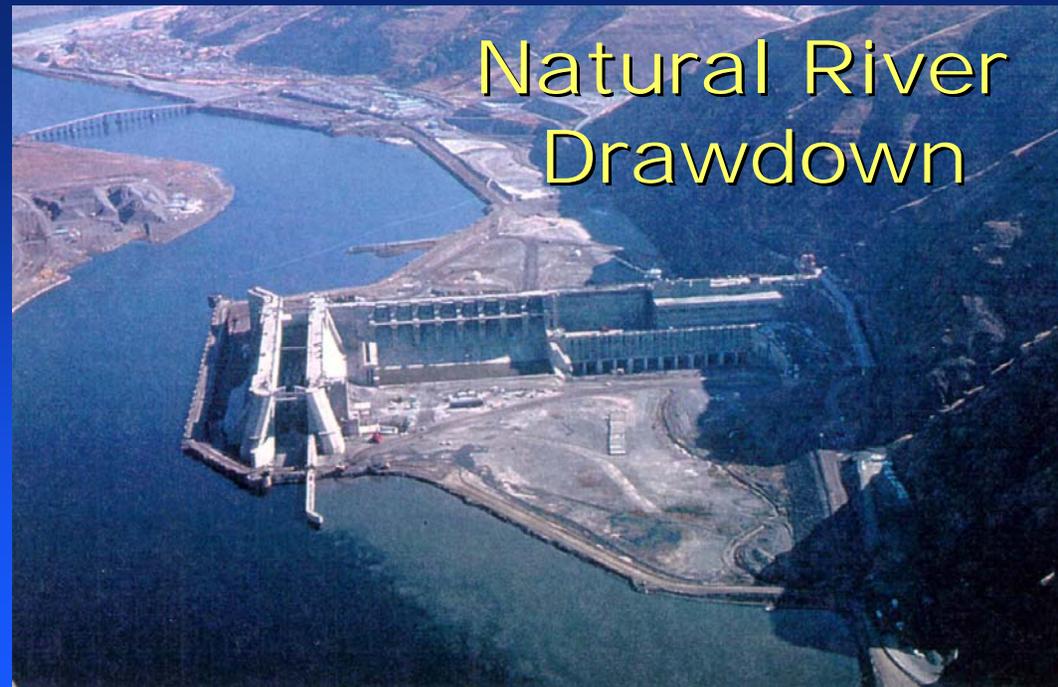
- Power
- Navigation
- Irrigation
- Recreation
- Fish & Wildlife



Existing
Operation

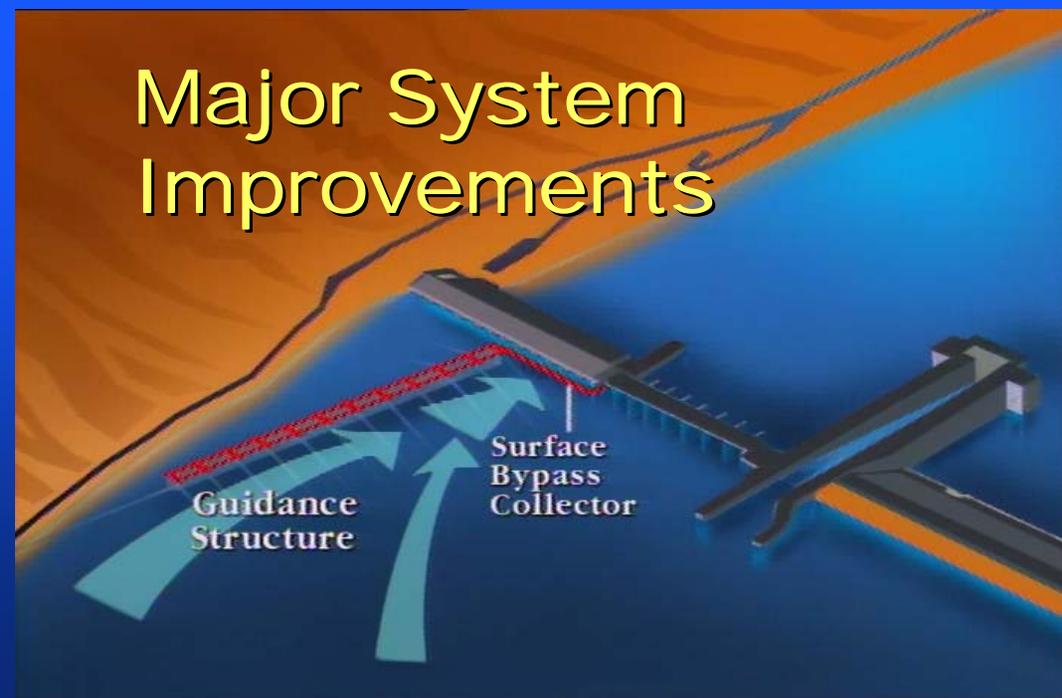


Natural River
Drawdown



**ALTERNATIVE
PATHWAYS**

Major System
Improvements





Project Characteristics

- **Completion Dates: 1961 to 1975**
- **Construction Cost: \$168 - \$375 million each**
- **Generating Capacity: 930 MW for 3 Plants, 693 MW for 4th (~3,500 MW total)**
- **Average Annual Energy: 11 million MWh**
- **7% of Total PNW Hydro Capacity**

Project Characteristics Cont.

- **Power: Power for city size of Seattle**
- **Irrigation: Water for 35,000 acres**
- **Navigation: 4-6 million tons/year**

Project Physical Modifications

- **Recreation Sites: currently 33 sites**
 - ◆ 3 remain intact
 - ◆ 11 abandoned/demolished
 - ◆ Others modified/relocated
- **Highways, Railroads & Bridges**
 - ◆ 40 miles of embankments need modifications
 - ◆ 15 highway & railroad bridges, 25 bridge piers
 - ◆ 500 drainage structures

Study Process

- **Regional Study Team Including:**
 - ◆ **Corps of Engineers**
 - ◆ **Bonneville Power Administration**
 - ◆ **National Marine Fisheries Service**
 - ◆ **U.S. Fish & Wildlife Service**
 - ◆ **U.S. Bureau of Reclamation**
 - ◆ **Northwest Power Planning Council**
 - ◆ **Tribes**
 - ◆ **Environmental Groups and Many Others**

Areas of Study

- **Hydropower***
- **Navigation***
- **Irrigation/Water Supply***
- **Recreation***
- **Anadromous Fish***
- **Regional Effects**
- **Social Effects**
- **Tribal Circumstances**
- **Air Quality**
- **Others**

Study Methodology

- **Hydroregulation Models**
 - ◆ **Power Generation**
 - ◆ **Reservoir Elevations & Outflow**
 - ◆ **Other Related Information**
- **Various Other Models & Evaluation Tools**

Power Study Methodology

- **Hydroregulation Models**
- **Power System Production Cost Models**
- **Market Price Projections**
- **Transmission System/Generation Reliability Assessments**
- **Ancillary Services**

Preliminary Study Results

(Average Annual Costs, \$Millions)

- **Power:** \$250 - \$300
- **Navigation:** \$35 - \$40
- **Water Supply:** \$14 - \$17
- **Implementation:** \$46
- **Recreation:** +\$60 - \$70
- **Avoided Costs:** +\$25 - \$30
- **Total Net Costs:** \$275 (\$4 billion pw)

Preliminary Study Results Cont.

- **Anadromous Fish Recovery**
 - ◆ High degree of uncertainty
 - ◆ Numerous assumptions and models
 - ◆ Estimated % increase in relative probability of recovery for breaching compared to existing condition ranges from 2% to 30%, most likely about 11% (Spring - Summer Chinook Salmon)

Summary

- **Comprehensive Regional Study Effort**
- **Total Study Cost about \$25 million**
- **Total Construction Cost of \$.8 - \$1.2 billion**
- **Total Net Cost \$275 million Annually, \$4 billion Present Worth**
- **Improvement in Anadromous Fish Recovery 2-30%, most likely about 11%**
- **Air Quality Impact 4 million tons more CO₂**

Next Steps

- **Draft Economics Report** July 99
- **Draft Feasibility Report/EIS** October 99
- **Final Feasibility Report/EIS** December 99
- **Report Sent to Congress** 2000
- **Implementation Begins** 2005
- **Implementation Completed** 2014

