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Project Configuration and Operation for Fish Passage at Bonneville, The Dalles, and John Day Dams

Adaptive Management Team Briefing

April 8, 2008

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Presentation Format

- Current Operation and Configuration for Fish Passage
- Smolt Passage Distribution
- Fish Survival
- Spill Limitations and Effects of Increased Spill
- Future Actions
- References

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Data Sources

- COMPASS Collaborative Work Group
  - Established to help with BiOp Remand
  - Developed spreadsheets for spring migrants with best available dam passage data
  - References at end of presentation
- Configuration and Operation Plans
  - Present a strategy for attaining dam passage survival standards
    - 96% Yearling Chinook and Steelhead
    - 93% Subyearling Chinook
  - Uses COMPASS Data for spring migrants


Bonneville Dam
Juvenile Fish Passage Routes
Bonneville 2
B2 Bypass
Corner Collector
Spillway
Bonneville 1
Ice and Trash Sluiceway
Counihan et al. 2005
Final report by USGS

Bonneville Dam

- Spring Operation
  - 100 kcfs spill day and night
- Summer Operation
  - 85 kcfs day
  - TDG cap night spill

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Bonneville Dam Juvenile Fish Distribution

Route	Yearling Chinook	Steelhead	Subyearling Chinook
B2 JBS	13.6%	8.5%	7.0%
B2 CC	18.7%	42.0%	22.4%
B2 Turb	25.2	8.9%	21%
Spill	35.1%	31.9%	47.1%
B1	7.5%	8.6%	3.3%

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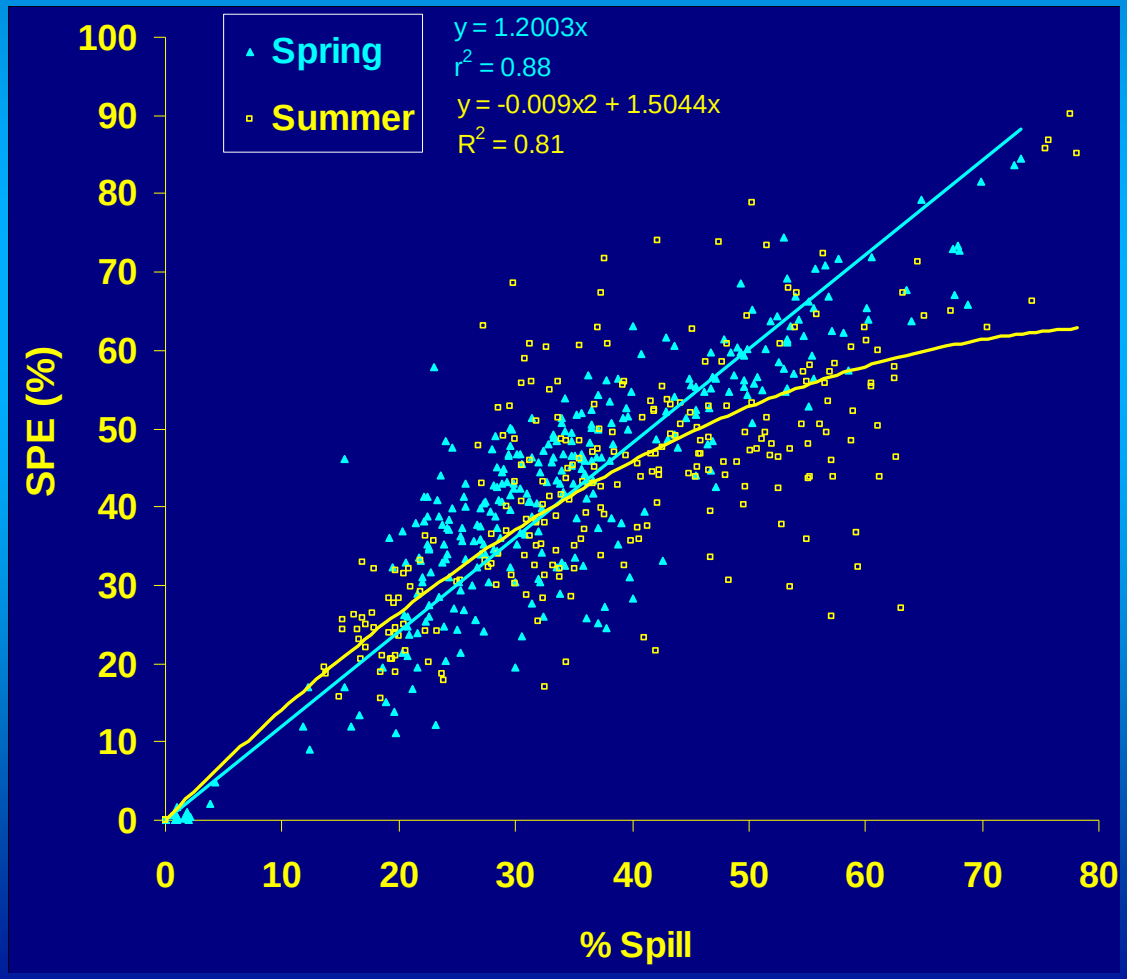
Effect of Percent Spill on Spill Passage Efficiency



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Bonneville Dam Juvenile Fish Survival

Route	Yearling Chinook	Steelhead	Subyearling Chinook
B2 JBS	98.0%	95.4%	95.5%
B2 CC	100.0%	100.0%	99.0%
B2 Turb	94.8%	87.9%	86.0%
Spill	96.9%	96.7%	89.3%
B1	95.1%	95.7%	91.7%
Dam	97.1%	97.2%	90.0%

* SURVIVAL DATA FROM COMPAS

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Limitations to Spill at Bonneville Dam

- **Adult Passage**
  - RT studies showed increased delay and fallback during daytime spill > ~100 Kcfs
  - Spring Chinook reascention after fallback substantially reduced in recent years – suspect sea lion predation
- **Emerging chum fry**
  - Maintain depth compensated TDG concentration ≤ 105% TDG at chum redds
- **Spillway Erosion** – not a current limitation but may become one in the future

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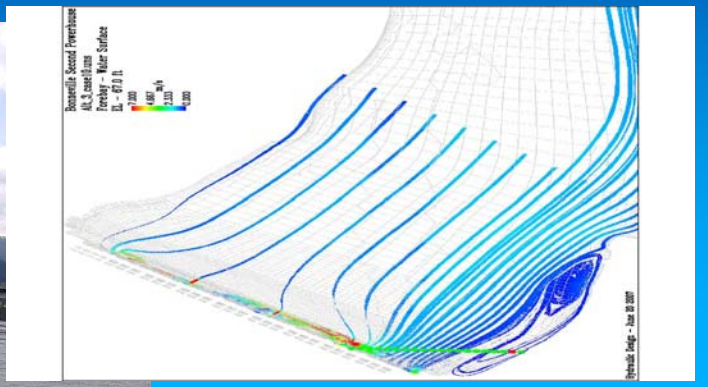
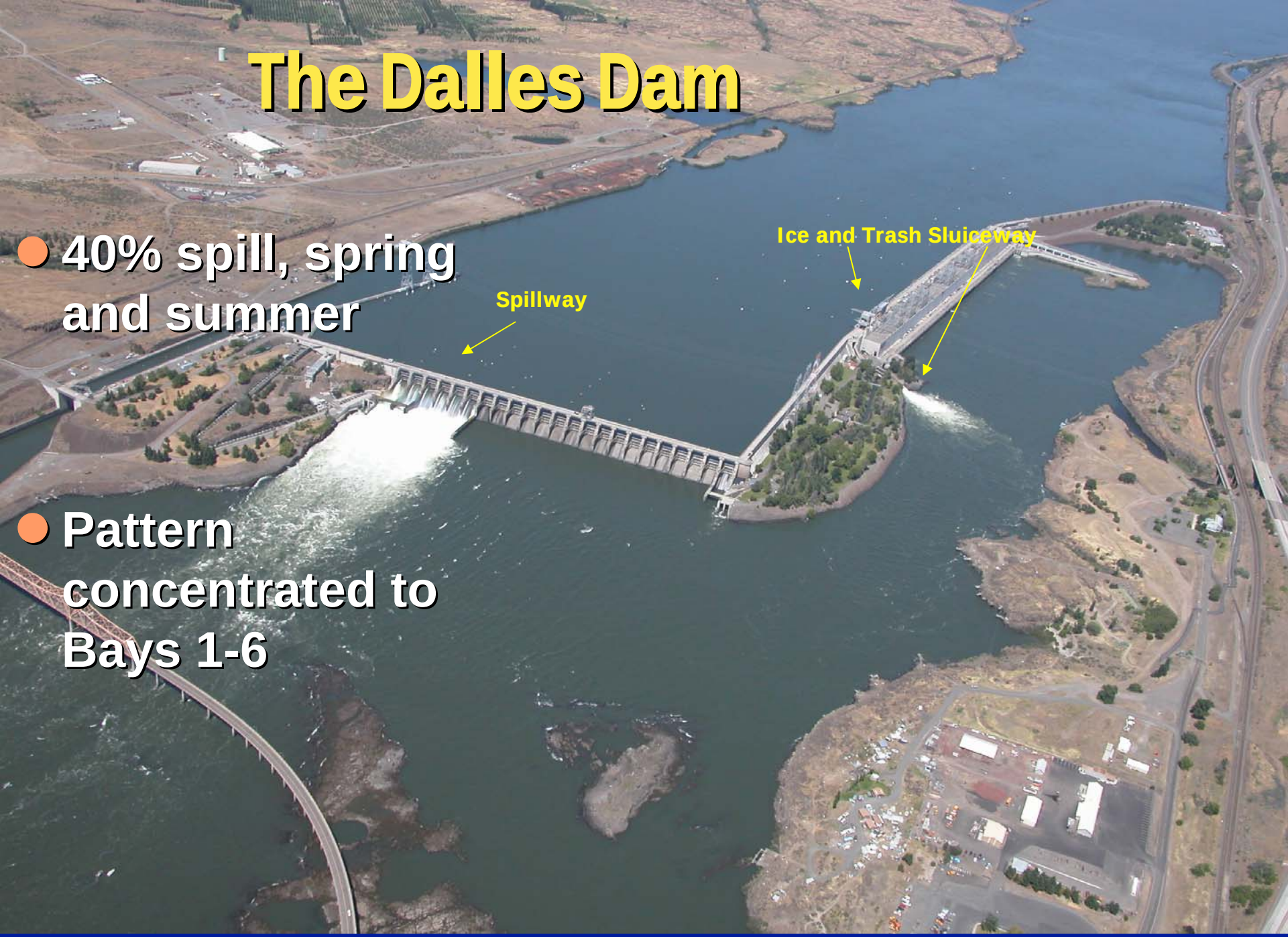
Future Actions to Improve Fish Passage at Bonneville Dam

- Spillway Survival Improvements
- B1 Ice and Trash Sluiceway
- B1 Minimum Gap Runner Turbines
- B2 Behavioral Guidance System
- B2 Fish Guidance Efficiency
- Evaluation of TDG effects on emerging chum fry
- B2 Orifice Improvements



The Dalles Dam



- 40% spill, spring and summer
- Pattern concentrated to Bays 1-6

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The Dalles Juvenile Fish Passage Distribution

Route	Yearling Chinook	Steelhead	Subyearling Chinook
Spill	80%	80%	78%
ITS	10%	10%	8%
Turb	10%	10%	14%

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The Dalles Juvenile Fish Survival

Route	Yearling Chinook	Steelhead	Subyearling Chinook
Spill	92.4%	92.4%	89.0%
ITS	99.4%	99.4%	93.0%
Turb	81.8%	81.8%	80.0%
Dam	91.4%	92.3%	91.3%

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Spill Limitations at The Dalles Dam

- Balloon-tag evaluations indicate direct injury above per-bay discharge of 21 Kcfs.
- Poor juvenile egress through bays 7 and higher
- North fishway little used at spill ≥ 100 Kcfs
  - Passage times do not appear to be affected
- Tailwater elevation / per bay discharge limitation for spillway shelf erosion (incorporated into current spill pattern)
- Bays 10 – 22 are emergency use only (red-tagged)

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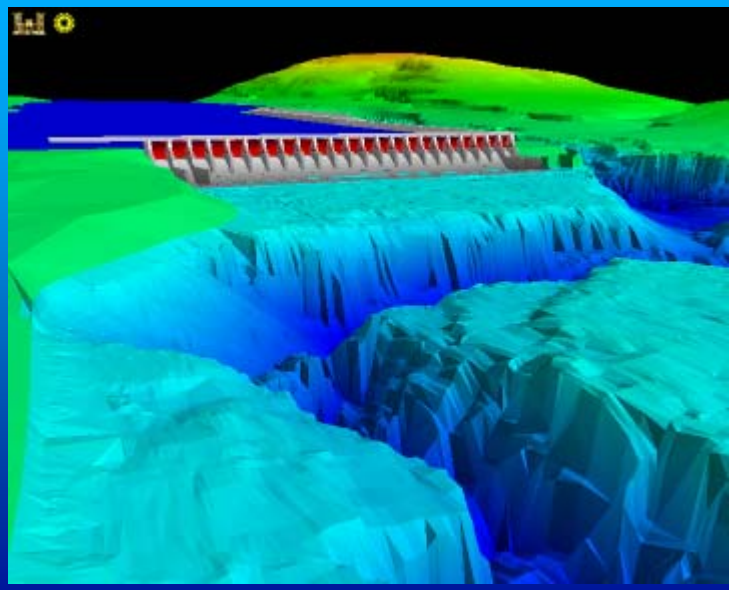
Future Actions to Improve Fish Passage at The Dalles Dam

- Extended Length Spillwall with fish spill confined to bays 1-8.
- Turbine Survival Improvements (BIT)
- East and North Adult Ladder Improvements
- AWS Back/Reliablity
- Improve Adult Use of N. Fish Ladder



John Day Dam

- Spring Operation (10 Apr – 31 Jun)
  - No day spill
  - 60% spill at night
- Summer Operation (1 Jul – 31 Aug)
  - 30% spill day and night

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John Day Juvenile Fish Passage Distribution

Route	Yearling Chinook	Steelhead	Subyearling Chinook
Spill	60%%	67%	59%
JBS	27%	26%	13%
Turb	13%	7%	28%

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John Day Juvenile Fish Survival

Route	Yearling Chinook	Steelhead	Subyearling Chinook
Spill	96.4%	97.3%	98.0%
JBS	96.5%	88.2%	92.0%
Turb	79.9%	79.9%	72.0%
Dam	91.8%	92.9%	90.4%*

* SUBYEARLING CHINOOK SURVIVAL GENERATED FROM JOHN DAY COP REPORT

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Spill Limitations at John Day Dam

- Spill greater than 60% degrades juvenile egress from the Powerhouse and JBS.
  - Longer tailrace egress times resulted in reduced survival in past studies at JDA
- Spill less than 25% does not provide good spillway egress
- River navigators require spill reduced from 60% to enter navigation lock

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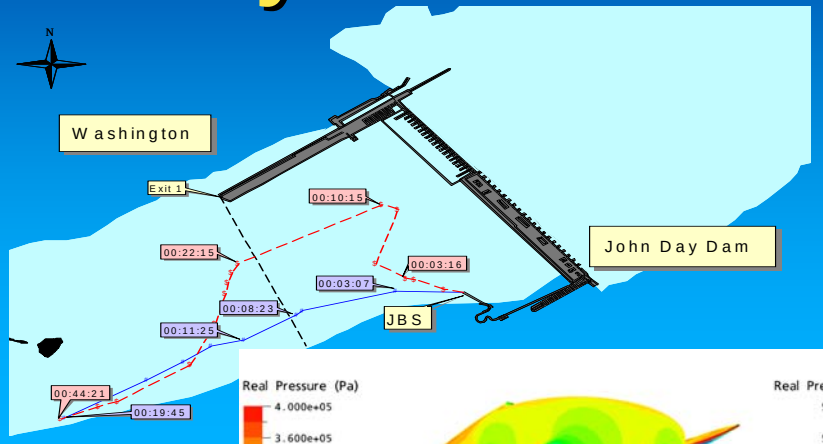
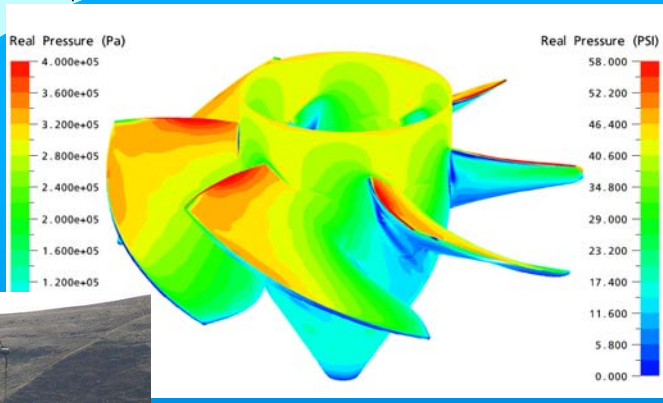
Future Actions to Improve Fish Passage at John Day Dam

- Surface Flow Spillway Options
- Tailrace Egress Improvements
  - -Spillbay 20 Deflector
  - - Spillwall
  - - 30 vs 40% Volume may impact what improvement is looked at.
- North Ladder Improvements
- Turbine Survival Improvements





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