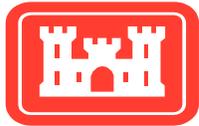




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Columbia River Fish Mitigation Project (CRFM)



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Columbia River Fish Mitigation Project

- Purpose: Mitigate impacts to anadromous fish passage at the Columbia/Snake River run-of- river dams
- Authority: Original Congressional dam construction and operation authorities
- Project initiation: 1991
- Funding source: Congressional appropriations
- Estimated project cost: \$1.5 -1.6 Billion
- Current estimated completion date: 2014

Pacific Ocean

Seattle

Columbia R.

Lower Monumental
Little Goose
Lower Granite

Tri Cities

Ice Harbor

Lewiston

Bonneville

McNary

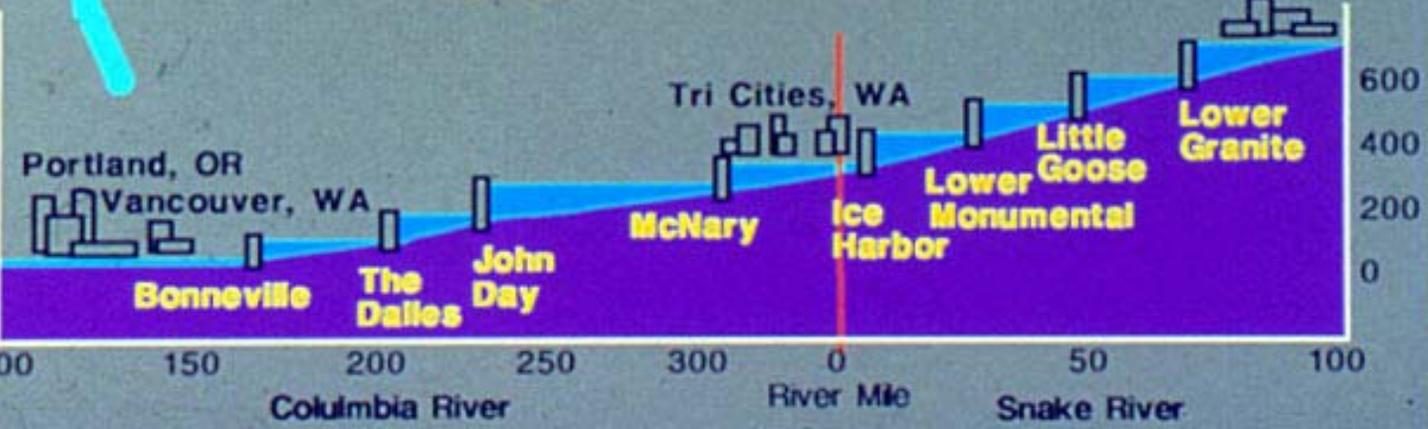
Portland

The Dalles

John Day

Lewiston, ID

Elevation MSL



Snake R.



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Columbia River Fish Mitigation Project

- BPA repayment of “power share” of construction and O&M costs
- Transfers to Plant-in-Service
 - Costs transferred when new facility goes into operation
 - Special Congressional guidance provided for “mitigation analysis” costs within the project
 - Hold until analysis “completed”
 - Originally contemplated a 2001 completion
 - Scope includes biological baseline evaluations , prototype development and testing, and alternatives analyses
 - Guidance pre-dated first BIOP and appreciation for the scope of the passage issues
 - Currently approximately \$300M being held
 - Corps revisiting the issue



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Columbia River Fish Mitigation Project

Annual Expenditures

1997	\$85.2M
1998	\$98.3
1999	\$78.6
2000	\$70.4
2001	\$84.5
2002	\$73.2
2003	\$82.3
2004	\$65.9

Transfers to Plant-in-Service (power share)

1997	\$
1998	\$
1999	\$14.1M
2000	\$47.0
2001	\$6.2
2002	\$8.8
2003	\$68.4
2004	\$62.9



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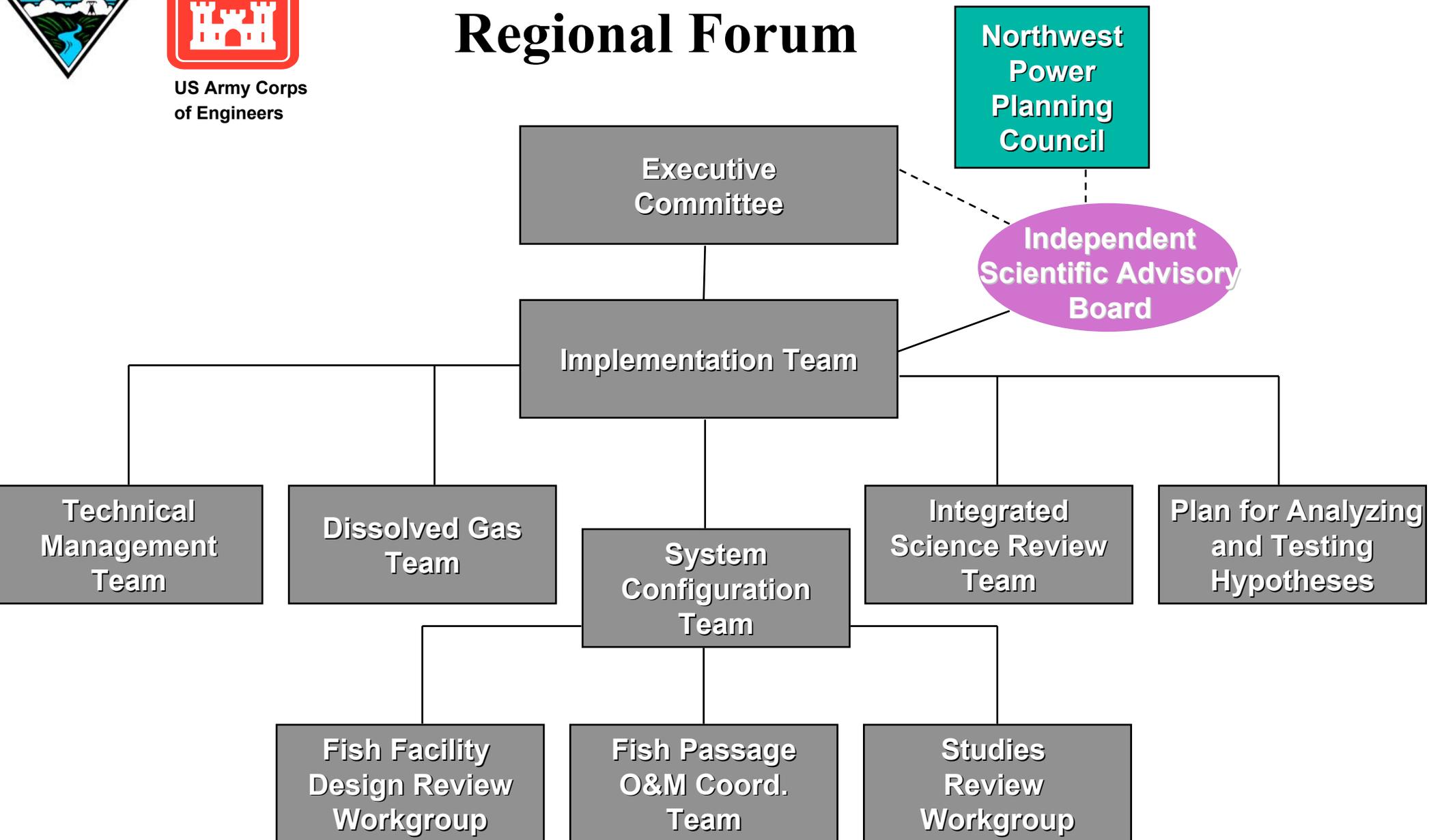
Columbia River Fish Mitigation Project

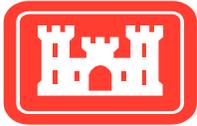
- Primary focus - passage facility configuration and operations at the dams
 - Evaluate project and system fish passage & survival
 - Identify/develop/construct passage improvements
 - Seek cost effective alternatives
 - Implement Biological Opinions
 - Regional coordination
 - Biological/technical review & input
 - Establish priorities
 - Critical issues/uncertainties for research
 - Biological outputs for alternative actions
 - Costs



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Regional Forum





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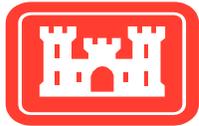
Columbia River Fish Mitigation Project

- **2005 program highlights**
 - Passage research at all projects except John Day and in the estuary
 - Avian predation research and planning
 - RSW construction at Ice Harbor
 - RSW design for Lower Monumental
 - Surface bypass/configuration evaluations at The Dalles, John Day, McNary and Little Goose



FY 2005 CRFM Program

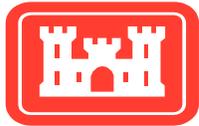
Project	Measure	Cost Est	Cuml.	Prior.	
1	Bonn	B2 corner collector evaluation	2,250	2,250	17
2	Bonn	Corner Collector PIT-Tag Detection	500	2,750	17
3	Bonn	Adult PIT tag detection	1,600	4,350	15.5
4	Bonn	PH 2 FGE improvements	2,695	7,045	13.5
5	Bonn	Juvenile Fish Passage studies	4,300	11,345	13
6	Bonn	B2 corner collector follow-on	620	11,965	12
7	Bonn	B2 DSM, monitoring, outfall follow-on	100	12,065	10
9	IH	Auxiliary water supply improvements	383	12,448	18
10	IH	PIT tag detection on the main transport flume	545	12,993	18
11	IH	Survival/efficiency study	261	13,254	8.5
12	IH	Removable spillway weir	14,137	27,391	7.5
13	JD	Configuration decision doc & surface bypass model study	1,100	28,491	15.5
14	JD	Biological studies	0	28,491	11.5
15	JD	JD mitigation evaluation (Ringold Hatchery)	125	28,616	
16	LGo	Removable spillway weir	0	28,616	18
17	LGo	Extended length screens	100	28,716	6
18	LGo	Survival/efficiency study	2,000	30,716	4
19	LGr	RSW summer radio tag study	1,922	32,638	17.5
20	LGr	RSW/BGS evaluation	1,916	34,554	12.5
21	LGr	Juvenile bypass system improvement	300	34,854	9
22	LGr	Extended length screens	185	35,039	6
23	LoMo	Barge loading improvements	108	35,147	16.5
24	LoMo	Removable spillway weir	2,812	37,959	12
25	LoMo	Survival/efficiency study	2,600	40,559	3.5
26	McN	Removable spillway weir	1,700	42,259	18
27	McN	McNary N. shore adult PIT	85	42,344	18
28	McN	Spillway gate and hoist rehab	1,330	43,674	17.5
29	McN	Extended length screens	255	43,929	6
30	McN	Survival/efficiency study	2,200	46,129	4.5
31	Sys	Flood control study	80	46,209	18
32	Sys	High Q PIT detection at spillway and intakes	100	46,309	18
33	Sys	Lamprey passage studies	450	46,759	15.5
34	Sys	PIT tag recovery estuary & avian islands	1,405	48,164	15.5
35	Sys	Estuary avian predation study	500	48,664	13
36	Sys	Juvenile delayed mortality study	2,800	51,464	12.5
37	Sys	Turbine passage survival study, Ph II incl. B.I.T.	855	52,319	10.5
39	Sys	Adult passage studies	1,190	53,509	8
40	Sys	Fish ladder transition pool and weir mods evaluation	100	53,609	7.5
41	Sys	Estuary studies	6,995	60,604	7
42	Sys	Evaluation of juvenile fish separators	115	60,719	5.5
43	Sys	Snake & McNary decision document	440	61,159	4.5
44	Sys	Adult passage temperature effects	459	61,618	
45	Sys	Sub-yearling survival study methods	195	61,813	
46	TD	Spillway and sluiceway evaluations	5,950	67,763	17
47	TD	Decision document	250	68,013	15.5
48	TD	Spillway modifications	300	68,313	12.5
49	TD	Forebay passage device (curtain)	440	68,753	11.5
50	TD	Spillway improvements study	0	68,753	10.5
51	TD	Surface bypass/forebay passage	2,000	70,753	9.5
52	TD	Sluiceway improvement	200	70,953	8
53			70,953		
54		Corps adds			
55		Lo Mo spillway parapet wall	620		
56		McN forebay temperature study	300		
57		TRT support	300		
58			72,173		
60		Additional potential adds			
61		Lo Mo spillway near field test	140		
62		B2 fish units intake trash rake	330		
63		TD sluiceway prototype j-blocks removal	500		
64		McNary adult lamprey	0		
			73,143		



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Columbia River Fish Mitigation Project

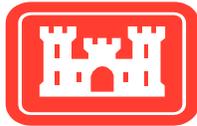
- Cost Effectiveness
 - Develop alternatives for each project or group of projects
 - Consider all costs, including opportunity costs
 - “Decision documents”
 - Coordinate with Regional Forum partners



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Columbia River Fish Mitigation Project

- **Project execution**
 - Follow guidelines of Corps' Project Management Business Process
 - Project Manager and Project Delivery Team assigned
 - Project Management Plan developed
 - Monthly management reviews (cost and schedule performance & issues)
 - Independent Technical Reviews



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Columbia River Fish Mitigation Project

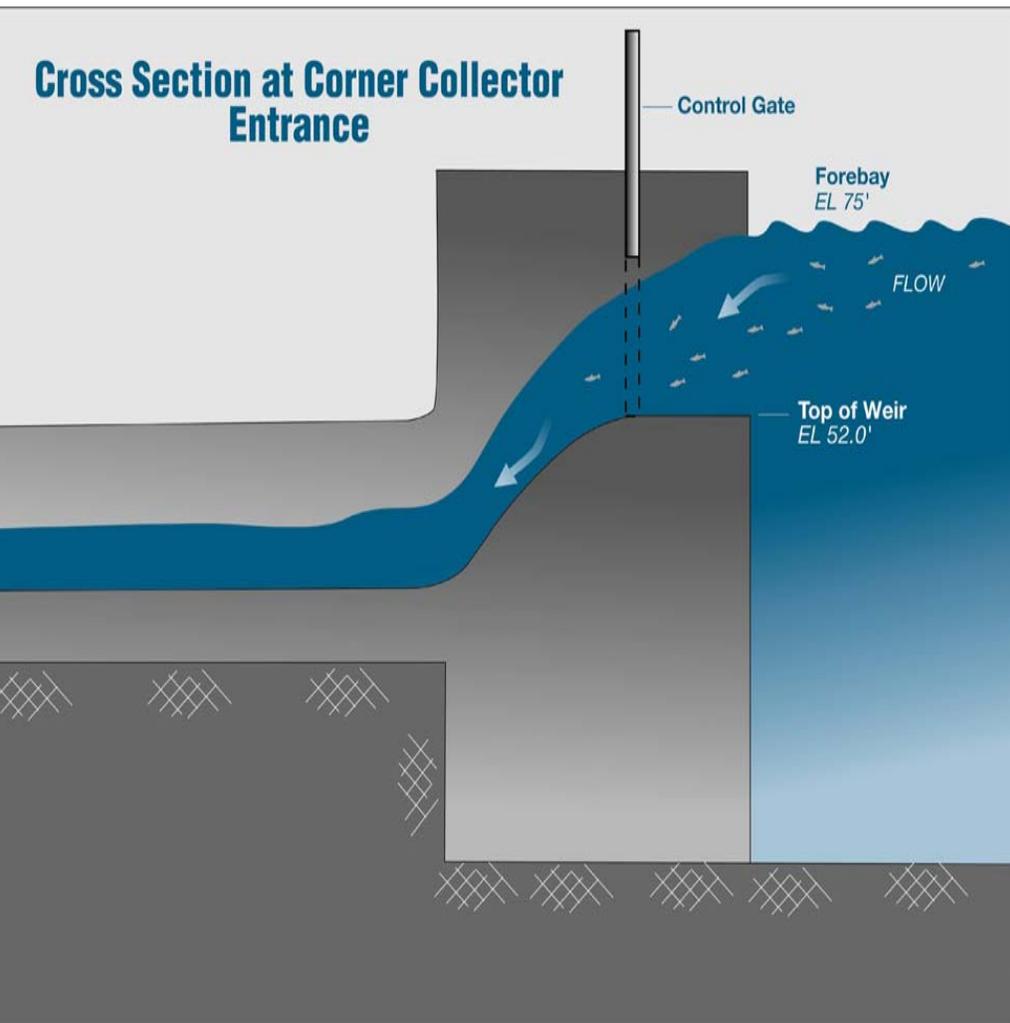
- **Anticipated future actions**
 - Continue development of surface bypass
 - Spillway weirs
 - Sluiceway modifications
 - Forebay guidance devices
 - System analysis for Snake River Dams and McNary (transport projects)
 - Decision documents for John Day & The Dalles, update Bonneville's
 - Continue to address biological performance issues



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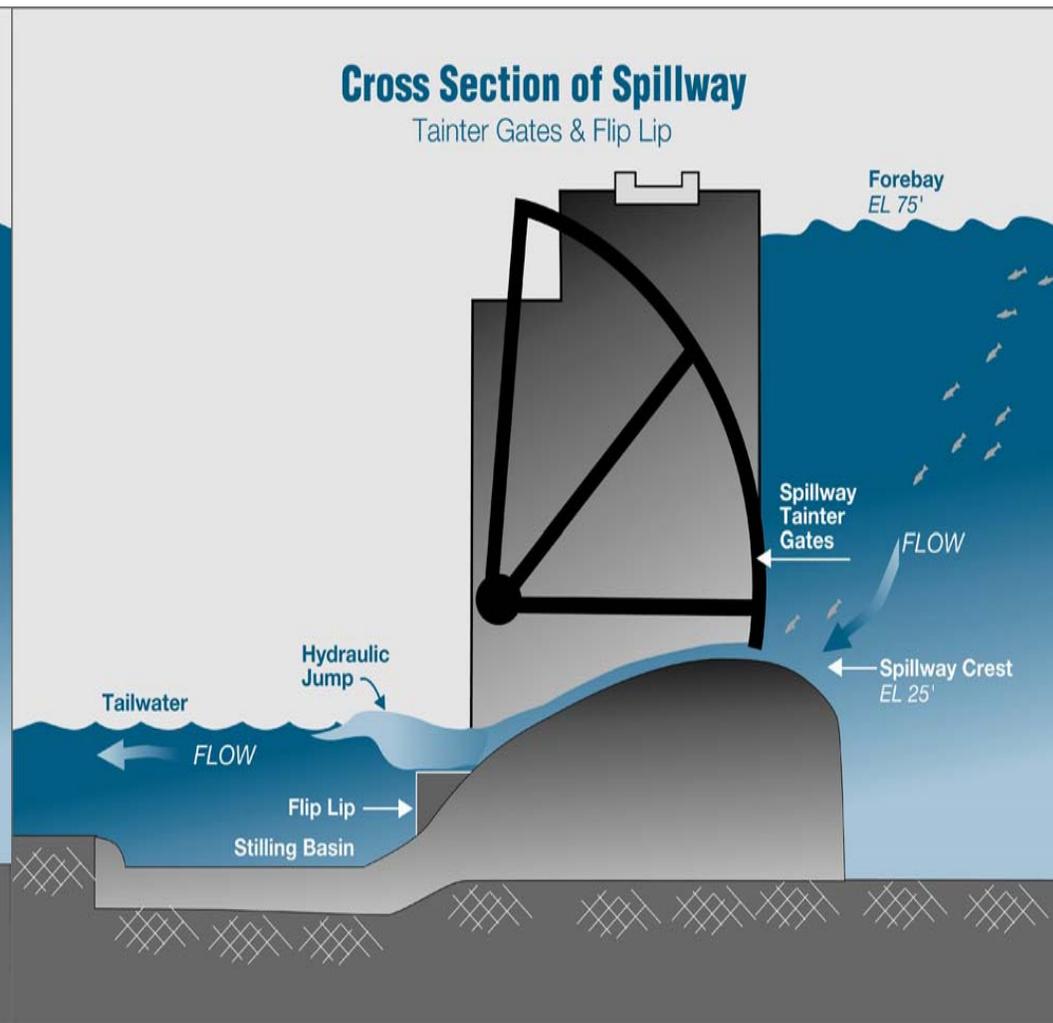
Surface Bypass vs. Spillway Bypass

Cross Section at Corner Collector Entrance



Cross Section of Spillway

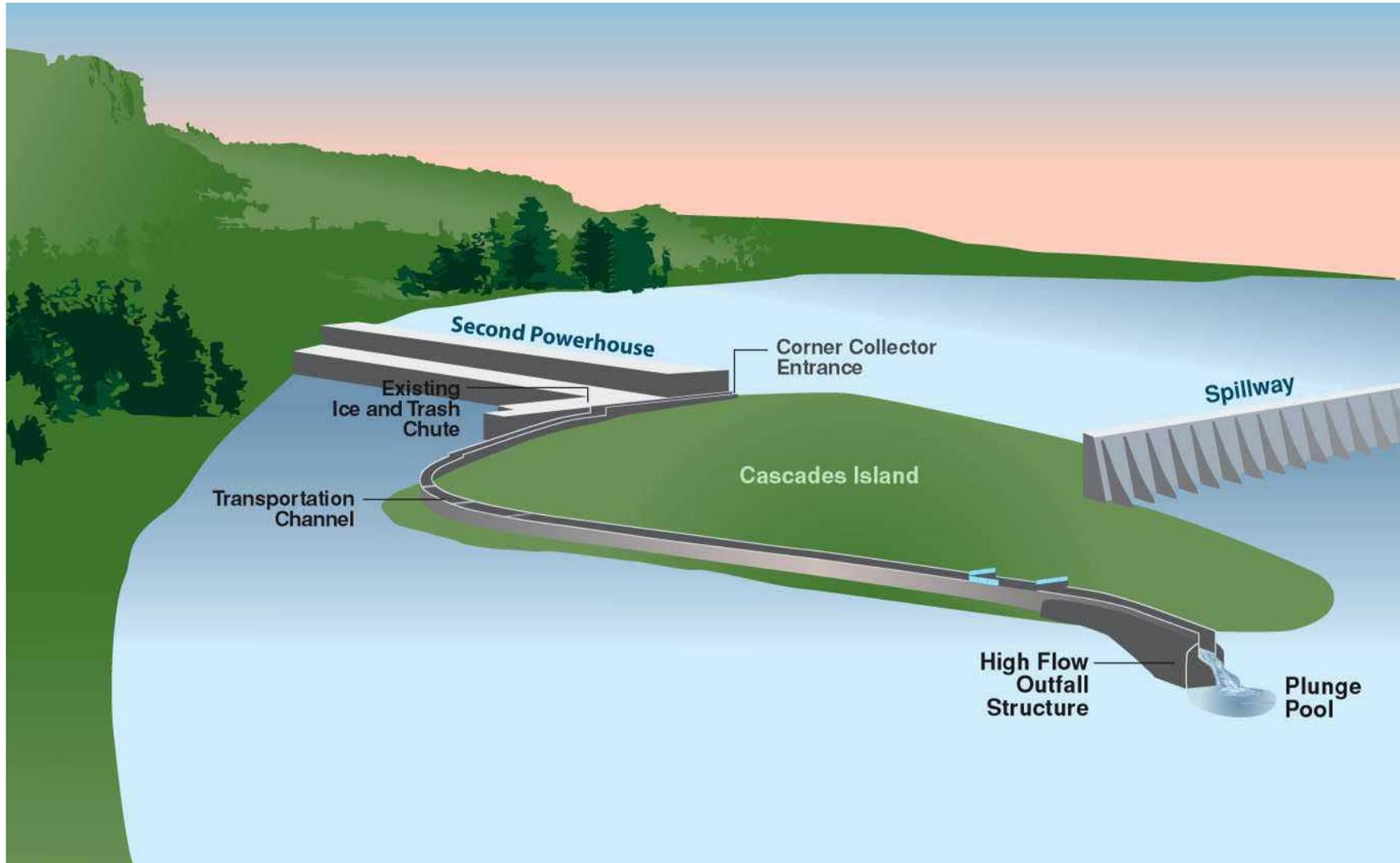
Tainter Gates & Flip Lip





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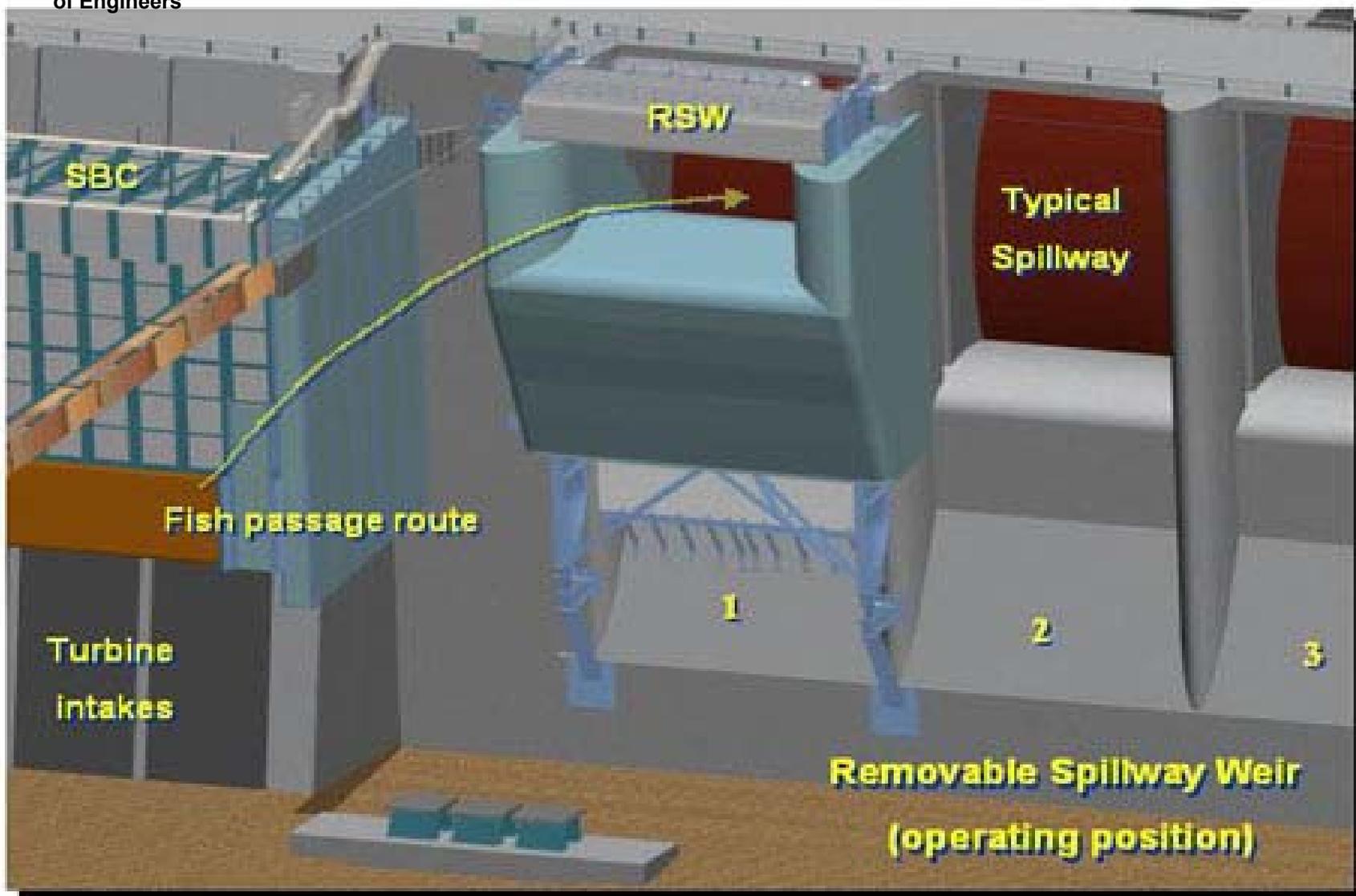
Bonneville 2ndPH Corner Collector





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Removable Spillway Weir





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Columbia River Fish Mitigation Project

- Costs
 - Thru FY 2004 (expended) \$ 930 million
 - FY 2005 (appropriated) \$ 75
 - FY 2006 (request) \$ 89
 - Annual estimates (2007-2014) \$70-90M /year
 - Estimated total project cost \$ 1,550-1,650 million
- Schedule
 - Complete by 2014 (to meet Biological Opinion goals)



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Columbia River Fish Mitigation Project

Questions and Answers

We've described the CRFM Project and the process for determining priorities to you.

- Are there other methods or criteria the region should be considering to help us in this process?
- Are there alternative approaches that should be considered to promote cost effective CRFM activities?