Corps and Reclamation O&M Expense IPR 2016-2017 Supplemental Information

- FCRPS Cultural Resources (Corps and Reclamation)
- CORPS Fish and Wildlife O&M
- Reclamation Leavenworth Hatchery Facilities
- CORPS Columbia River Fish Mitigation (CRFM)

FCRPS Cultural Resources and Fish and Wildlife O&M

- Program drivers for mitigation responsibilities associated with Section 106 Compliance and the Biological Opinions, as well as addressing aging infrastructure (both NREX and Capital).

- Risks:

  - Aquatic Nuisance Species (zebra and quagga mussels). Funding for prevention or maintenance is not included in these budgets.

  - Aging infrastructure

FCRPS CULTURAL RESOURCE PROGRAM
Corps, Reclamation and BPA

Program Purpose

- Federal Agencies are required to address impacts to cultural resources resulting from operation and maintenance of FCRPS hydroelectric projects
  - Must comply with National Historic Preservation Act, Archaeological Resources Protection Act, and Native American Graves Protection and Repatriation Act
  - Agencies committed to compliance with these laws in the System Operation Review Records of Decision (1997) and FCRPS Systemwide Programmatic Agreement (2009)
  - Compliance is accomplished through 8 systemwide cooperative working groups composed of regional Tribes, State Historic Preservation Officers, and other affected land managing agencies

Cultural Resources Program
FY2016-FY2017 Funding Proposal

- **Historic Program Funding Levels**

FY 1997 - FY 2011: ~$4.5M Annually Systemwide
FY 2012 – FY 2015: ~$8.4Million Annually Systemwide

- **FY 2016 – FY 2017 Projected Budget Needs**

	FY 2016			FY 2017		
	Power Share	Appropriated Share	Total	Power Share	Appropriated Share	Total
Corps	$5,027,000	$775,000	$5,802,000	$5,178,000	$798,000	$5,976,000
Reclamation	$3,874,000	$474,000	$4,348,000	$3,993,000	$489,000	$4,482,000
TOTAL	**$8,901,000**	**$1,249,000**	**$10,150,000**	**$9,171,000**	**$1,287,000**	**$10,458,000**

FCRPS CULTURAL RESOURCES PROGRAM

- **Key Factors Supporting Proposed Funding Levels**

- No inflation increase from 1997-2011

- Evolving Program Scope & Compliance Requirements

  - More construction for Shoreline Stabilization projects including support services such as Engineering Design, GIS, and NEPA
  - Conduct Identification, Evaluation and Mitigation for effects to Traditional Cultural Properties
  - Allow for large-scale mitigation/treatment projects while still accomplishing remaining field inventories and National Register determinations
  - Dedicated full-time FCRPS program and support staff to maintain consistent program execution and comply with Systemwide Programmatic Agreement

FCRPS CULTURAL RESOURCES PROGRAM

- **Program Activities are Guided by Long Term Goals Tied to Procedural Steps in the National Historic Preservation Act**
  - Inventory of Historic Properties
  - Evaluation of National Register Significance
  - Resolution of Adverse Effects (Mitigation)
- **Program Accomplishments at 14 Hydroelectric Projects as of FY2013**

SURVEY - Archaeological	Total Acres Affected by O&M	Total Acres Surveyed to date
	229,000	103,000
SURVEY - TCP	Number of Studies Completed as of FY13	
	109	
NR ELIGIBILITY DETERMINATIONS	Total Number of Sites Identified	NR Eligibility Determinations Complete
	3,550	1,077
RESOLUTION OF ADVERSE EFFECTS	Shoreline Stabilization Projects	Other Mitigations
	28	164

FCRPS CULTURAL RESOURCES PROGRAM

Projected Program Needs in FY2016 and FY2017

SURVEY - Archaeological	Acres Requiring Survey to Meet Long Term Goal	Projected No. of Acres Surveyed in FY16	Projected No. of Acres Surveyed in FY17
	126,000	42,000	42,000
SURVEY - TCP		FY16 Studies	FY17 Studies
		10	10
NR ELIGIBILITY DETERMINATIONS	NR Eligibility Determinations in Need of Completion	No. NR Determinations Complete in FY16	No. NR Eligibility Determinations Complete in FY17
	2,473	28	28
RESOLUTION OF ADVERSE EFFECTS*		FY16 Mitigation Projects	FY17 Mitigation Projects
		14	14

*Resolution of Adverse Effects includes bank stabilization, data recovery, site restoration, construction of interpretive trails at public parks, limiting public access to sites, invasive weed control, artifact curation, educational displays, brochures, posters, short films, popular books, funding public service announcements, installation of ARPA signs, site monitoring, training, and public presentations (at professional conferences, public schools, and other forums).

Corps Mitigation/Treatment

CHIEF JOSEPH PROJECT- 45OK239 Stabilization

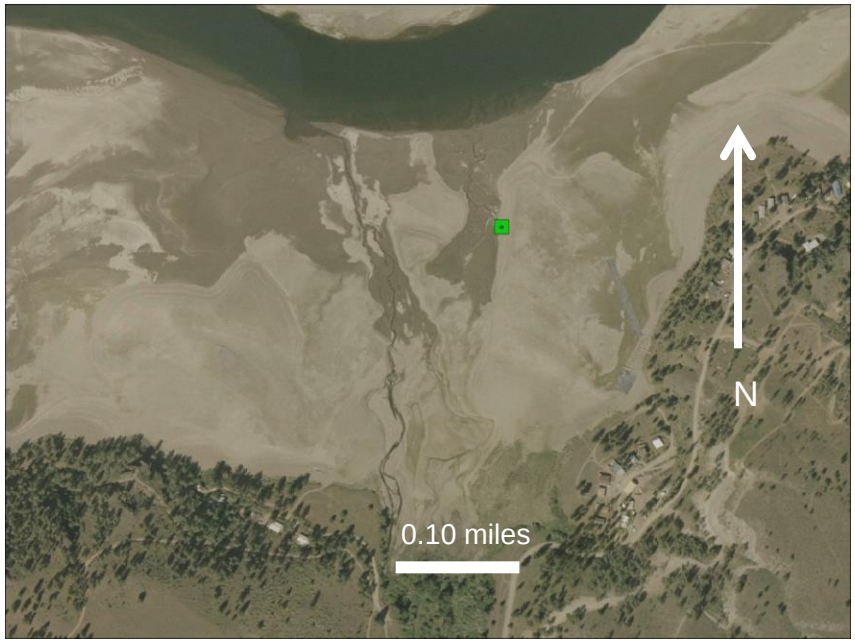
LIBBY DAM Project - Alexander Creek Stabilization

Reclamation Mitigation/Treatment
45FE1 Stabilization Project
Completed Summer 2013

Sensitive location required use of a barge-mounted crane to build gabion baskets

Aerial view of the completed structure, which covers the most rapidly eroding area

Reclamation Mitigation/Treatment
Additional Stabilization Projects in Planning Process
Possible FY18-19 Project



Some of the areas needing work cover many acres
(Foundation shown in green)

Braided streams & poorly consolidated soil will complicate work
(Note foundation location)

US Army Corps of Engineers

Joint Funded Operations and Maintenance Budget for the Fish and Wildlife Program

Portland, Seattle and Walla Walla Districts

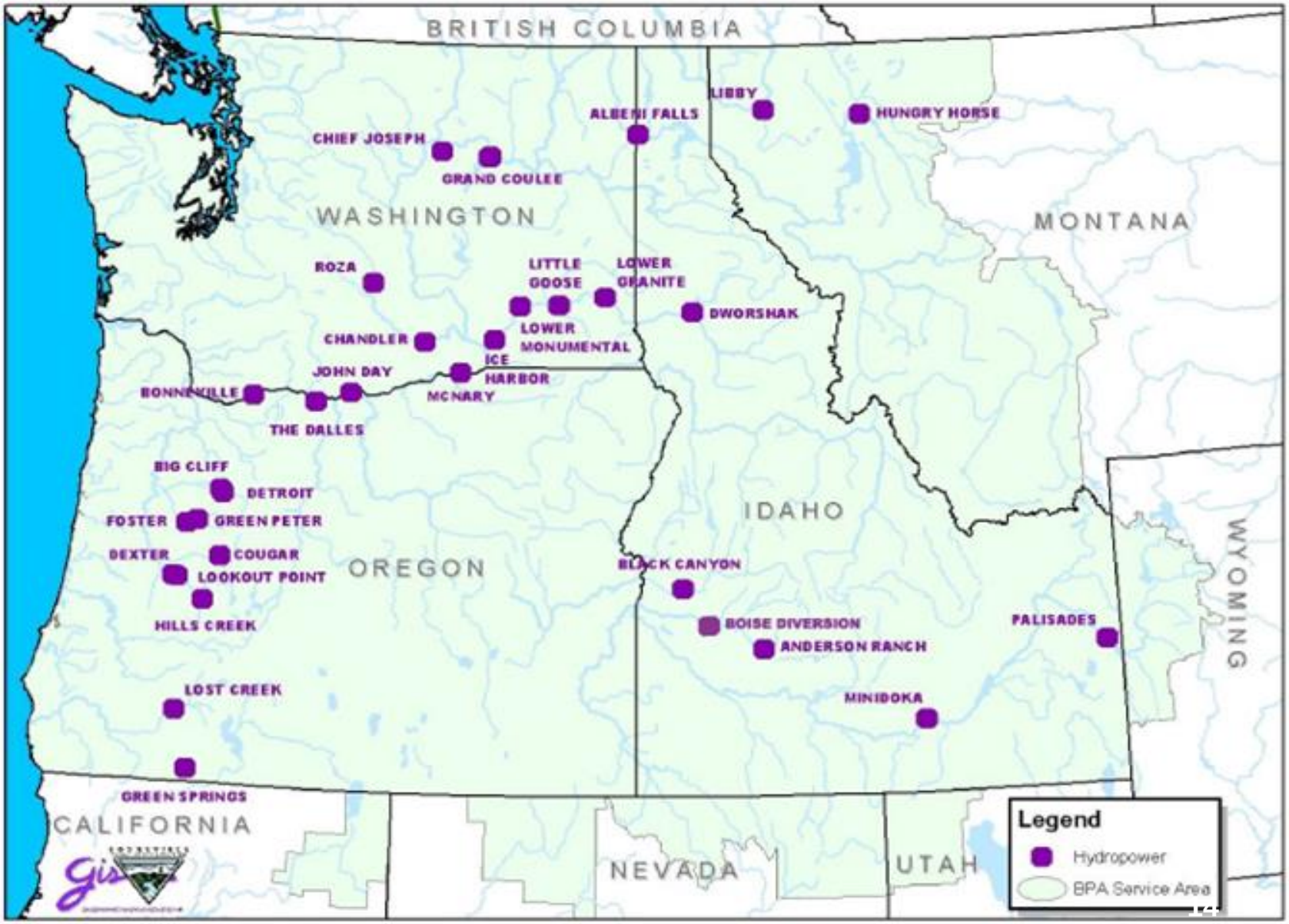
Tim Dykstra
Environmental Stewardship Program Manager
US Army Corps of Engineers
Northwestern Division

US Army Corps of Engineers
Northwestern Division

US Army Corps of Engineers
Northwestern Division

Corps F&W Expense Budget

- Funding for Fish and Wildlife related O&M tasks in areas affected by the operation of Corps hydropower producing dams:
  - Willamette & Rogue Basins (9)
  - Lower Columbia River (4)
  - Snake River Basin (5)
  - Upper Columbia Basin (3)


BRITISH COLUMBIA
LIBBY
HUNGRY HORSE
ALBENI FALLS
CHIEF JOSEPH
GRAND COULEE
WASHINGTON
MONTANA
ROZA
LITTLE GOOSE
LOWER GRANITE
DWORSHAK
LOWER MONUMENTAL
CHANDLER
ICE HARBOR
JOHN DAY
MCNARY
BONNEVILLE
THE DALLES
BIG CLIFF
DETROIT
FOSTER
GREEN PETER
IDAHO
DEXTER
COUGAR
LOOKOUT POINT
OREGON
BLACK CANYON
HILLS CREEK
BOISE DIVERSION
PALISADES
ANDERSON RANCH
WYOMING
LOST CREEK
MINIDOKA
GREEN SPRINGS
CALIFORNIA
NEVADA
UTAH
Legend
Hydropower
BPA Service Area

US Army Corps of Engineers
Northwestern Division

Funding for Corps Program

- Appropriated Budget from Congress (approximately 35%):
  - Environmental Stewardship
  - Budgeted 2 Years Out
  - Sometimes differences in the President's Budget and actual Appropriations
  - Uncertainty in funding levels from year to year

- Direct Funded BPA Program (approximately 65%):
  - Matched on a project-by project basis
  - BPA % varies by project

US Army Corps of Engineers ®
Northwestern Division

Corps F&W Expense Budget

(based on 2011-2013 expenditures)

- Anadromous Fish (87%):
  - operation/maintenance of fish passage facilities at dams, mitigation hatcheries, smolt transportation, multi-year fish passage research outlined by BiOps, program management.
  - spare parts for fish passage facilities, painting fish barges, coordinating and conducting fish operations, and conducting irregular fish passage or disease research, project management.

- Wildlife and Resident Fish (10%):
  - baseline wildlife management, habitat mitigation, mitigation hatchery maintenance, and invasive species coordination, project management.

- Water Quality (3%):
  - Total Dissolved Gas and Temperature monitoring/modeling, and TMDL coordination, project management.

US Army Corps of Engineers
Northwestern Division

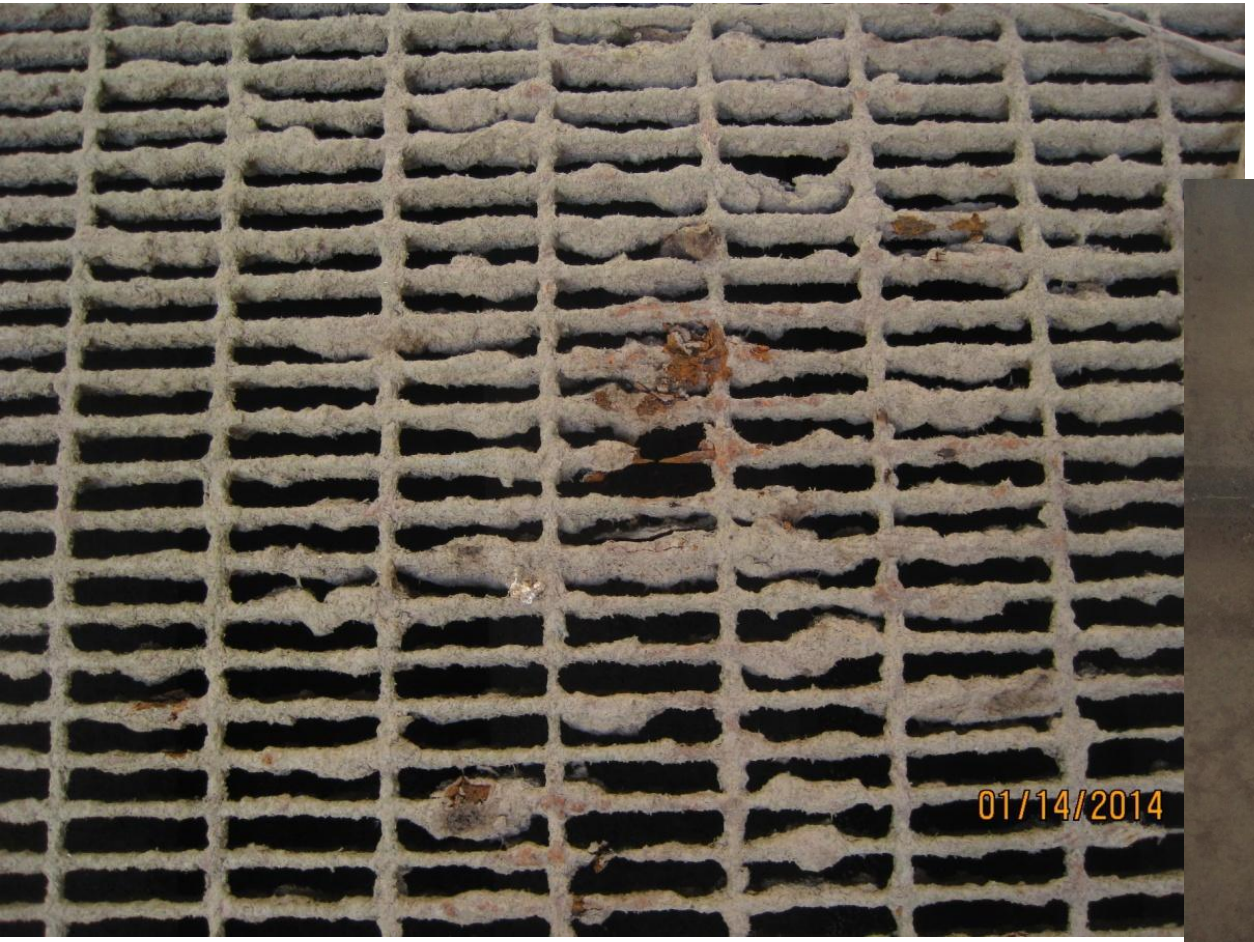
Funding For Corps Program

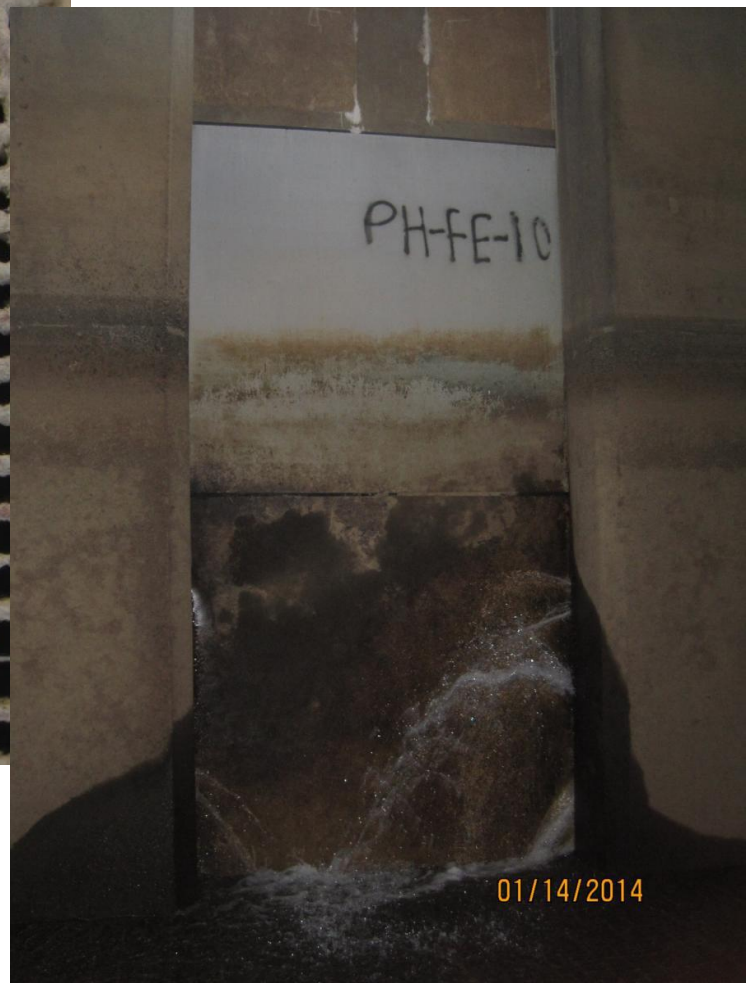
- The need for O&M funding in the Corps F&W Program continues to grow for two primary reasons:

1. Aging infrastructure
2. New infrastructure

US Army Corps of Engineers
Northwestern Division

Adult Fish Passage – Failed Collection Channel Gratings and Bulkheads





BONNEVILLE POWER ADMINISTRATION

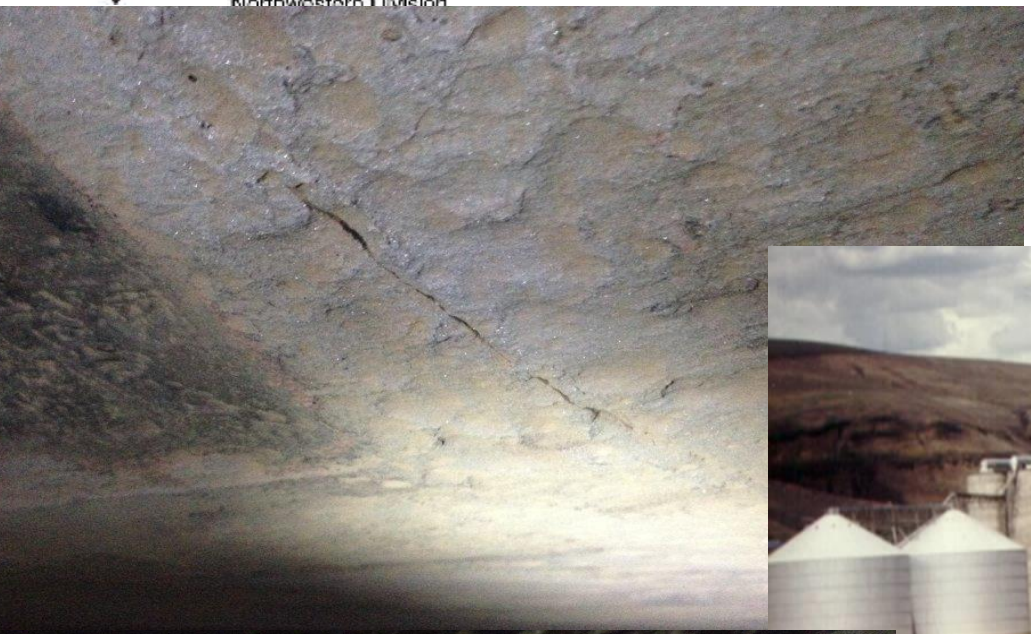
US Army Corps of Engineers ®
Northwestern Division

Fish Screen (ESBS) Frame Corrosion

BONNEVILLE POWER ADMINISTRATION

US Army Corps of Engineers ®
Northwestern Division

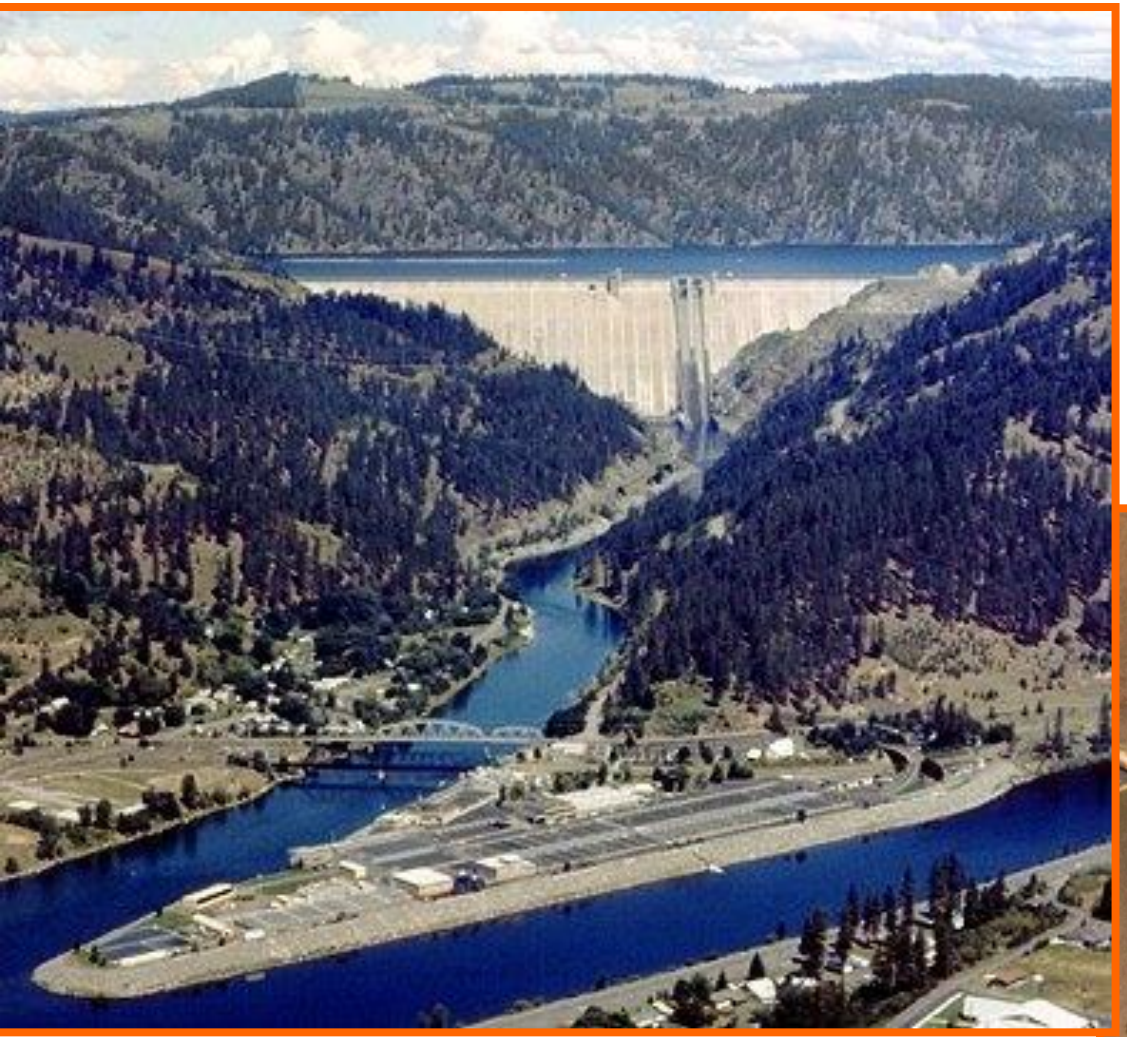
Fish Barge – Corrosion and Crack in Hull, Plunger Failure



BONNEVILLE POWER ADMINISTRATION

US Army Corps of Engineers
Northwestern Division

Aging Hatchery Infrastructure



Funding For Corps Program

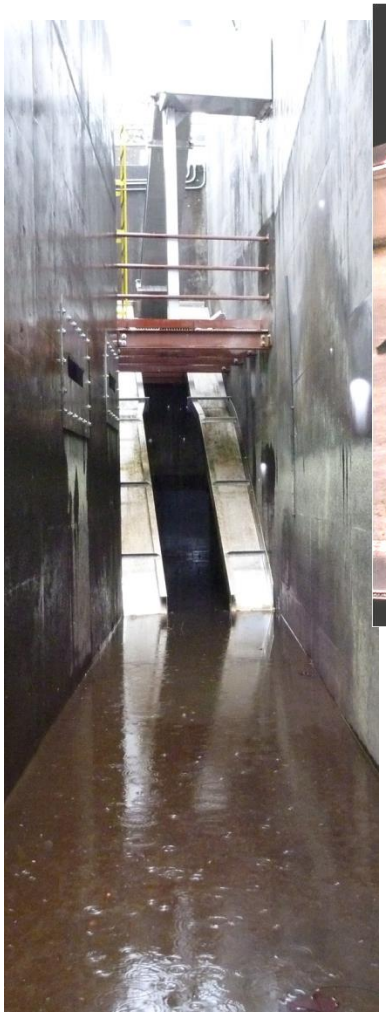
- The need for O&M funding in the Corps F&W Program continues to grow for two primary reasons:

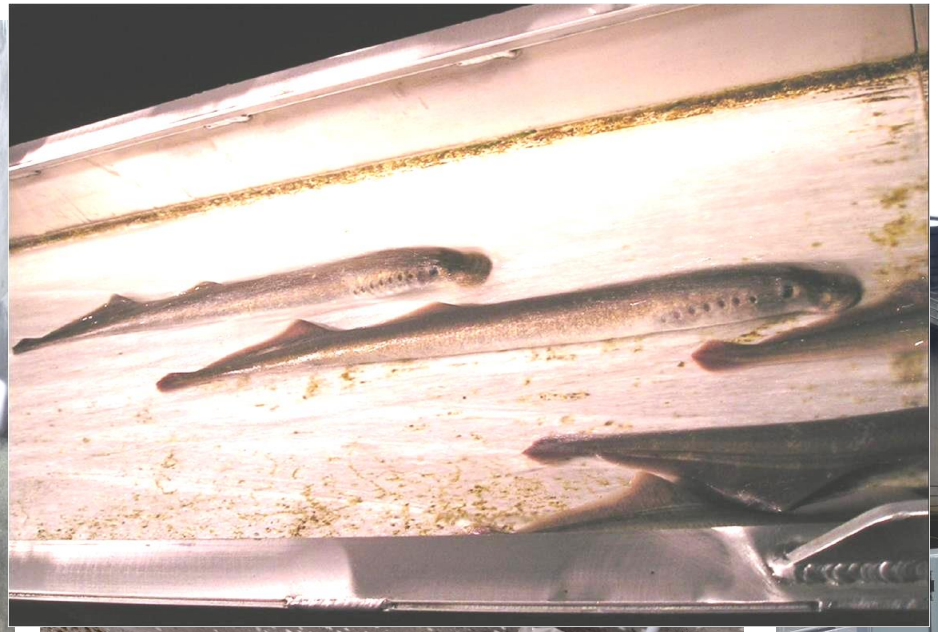
1. Aging infrastructure
2. New infrastructure

BONNEVILLE POWER ADMINISTRATION

US Army Corps of Engineers ®
Northwestern Division

Innovative Lamprey Passage Systems (LPSs) throughout the Lower Columbia





US Army Corps of Engineers
Northwestern Division

New Juvenile Fish Collector at Cougar Dam

US Army Corps of Engineers
Northwestern Division

Minto Adult Fish Facility During Construction

US Army Corps of Engineers
Northwestern Division

Foster Adult Fish Facility Under Construction

US Army Corps of Engineers
Northwestern Division

Corps F&W Expense Budget

Distribution of F&W Budget by Activities

	FY11-13
Fish Passage	44%
Hatcheries	20%
Transportation	16%
Wildlife and Resident Fish	10%
Research	5%
Water Quality	3%
Project/Program Mgt.	2%

CORPS F&W EXPENSE BUDGET

Year	Walla Walla	Seattle	Portland	Total
2010	$20,024,000	$3,327,000	$17,897,000	$41,248,000
2011	$20,872,000	$2,613,000	$17,488,000	$40,973,000
2012	$22,552,000	$2,942,000	$16,895,000	$42,389,000
2013	$23,215,000	$3,334,000	$17,079,000	$43,628,000
2014*	$23,063,000	$4,564,000	$21,184,000	$48,811,000
2015*	$22,757,000	$3,459,000	$24,397,000	$50,613,000
2016*	$23,660,000	$3,950,000	$25,437,000	$53,047,000
2017*	$24,370,000	$3,950,000	$26,200,000	$54,520,000

* Includes CRFM O&M

US Army Corps of Engineers
Northwestern Division

Big Issues on the Horizon

- More Fish and Wildlife Program requirements are putting a direct strain on the budget:
  - Willamette BiOp
  - FCRPS BiOp
  - Clean Water Act Requirements
  - Hatchery Management Requirements
  - Invasive Species
  - Nationwide appropriated funds

- More ES requirements at non-hydro projects are putting an indirect strain on the budget:
  - More requirements at non-hydro projects reduce the available appropriated funds at a faster rate
    - Mill Creek
    - Howard Hanson
    - Mud Mountain

Operations, Maintenance, and Replacement Budget Leavenworth Fisheries Complex

Leavenworth Fisheries Complex

- Reclamation has a continuing responsibility to mitigate, to acceptable levels of abundance, the salmon resources adversely impacted by the construction and operation of Grand Coulee Dam (1991 IG audit).

- Construction of the Leavenworth, Entiat, and Winthrop National Fish Hatcheries occurred from 1938-1940. The facilities were transferred to the US Fish and Wildlife Service in 1949.

- The Complex is composed of the three fish hatcheries and the Mid-Columbia Fisheries Resource Office (MCFRO).

- The budget covers operations of the three hatcheries as well as a portion of the MCFRO and the Olympia Fish Health Center (OFHC). The MCFRO provides monitoring and evaluation of hatchery stocks, marking programs, and permitting compliance for all LFC programs and activities. The OFHC provides fish diagnostic services in support of healthy salmon stocks.

Leavenworth Fisheries Complex

- LFC fish production programs support mitigation efforts in the Columbia River Basin. Production goals are set in the Columbia River Fisheries Management Plan under the U.S. v. Oregon decision of 1969.

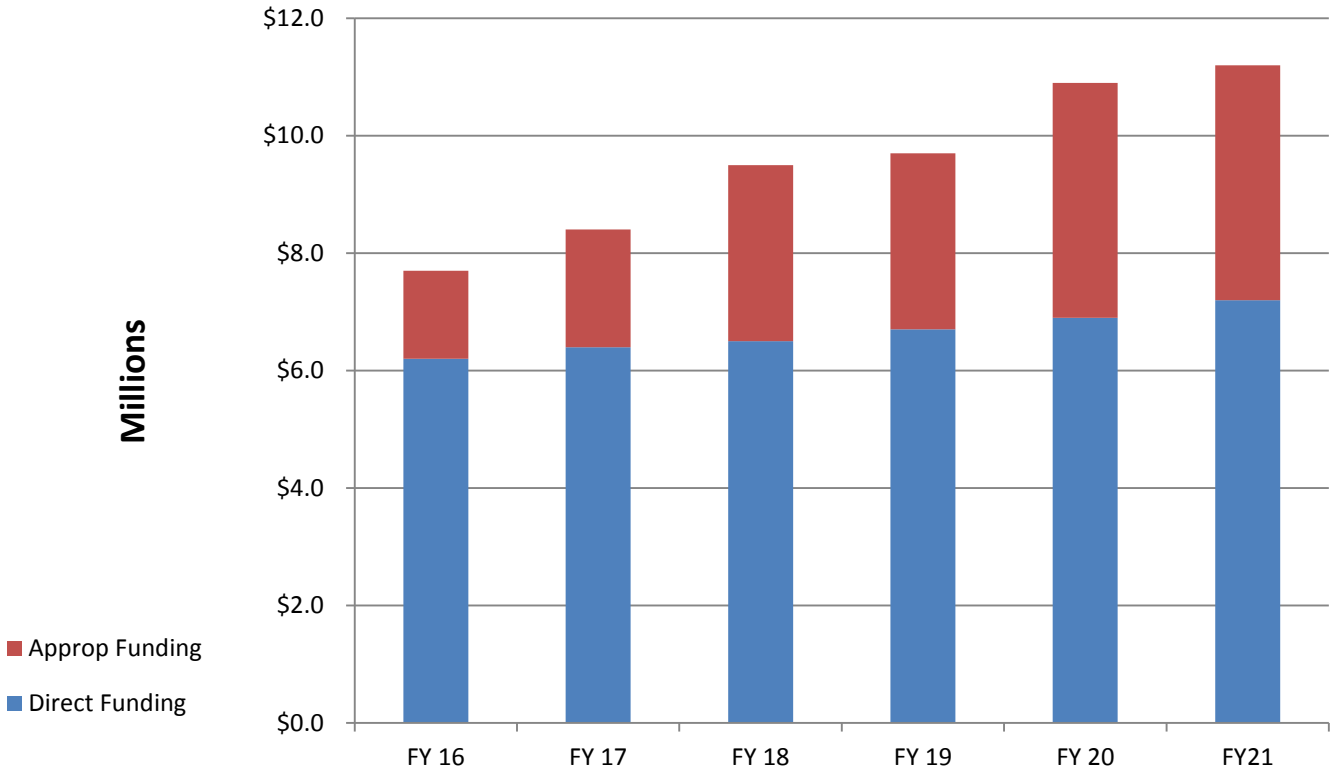
- The Leavenworth National Fish Hatchery (NFH) currently rears 1.2 million spring Chinook salmon smolts annually and provides a tribal and sport fishery on Icicle Creek.

- The Entiat NFH rears 400,000 summer Chinook salmon smolts annually for release into the Entiat River for harvest opportunities.

- The Winthrop NFH rears 600,000 spring Chinook salmon as an integrated harvest program and 100,000 summer steelhead for release into the Methow River as an integrated recovery program.

Leavenworth Program Levels

	FY 16	FY 17	FY 18	FY 19	FY 20	FY21
Approp Funding	$1.5	$2.0	$3.0	$3.0	$4.0	$4.0
Direct Funding	$6.2	$6.4	$6.5	$6.7	$6.9	$7.2



Fiscal Year 2015 – 2021 Program Drivers

- Regulatory Compliance:
  - New requirements to comply with terms and conditions of consultations and permits
    - Leavenworth Fish Screens
    - Addressing Phosphorus Issues
- Aging Infrastructure:
  - Original construction in 1939.
  - Significant rehabilitation/modernization of hatcheries required.
- Appropriations:
  - Flat and/or declining budgets.

Leavenworth Fisheries Complex

- O&M Budget Allocation:
  - Facilities Operations for Leavenworth, Entiat, and Winthrop Hatcheries: ~ 60%
  - MCFRO Support: ~ 20%
    - Monitoring and evaluation program, tagging, marking programs, permit compliance, Biological Assessments, Hatchery and Genetic Management Plans, ESA compliance, supplies, and materials.
  - Olympia Fish Health Center Support: ~10%
    - Diagnostic fish health services at Leavenworth, Entiat, and Winthrop NFH's monthly fish health inspection throughout the entire rearing cycle of the salmon (egg to adult), diagnostic work, supplies, and materials.
  - Facilities Maintenance: ~ 10%

Columbia River Fish Mitigation Project (CRFM)

2014 Integrated Program Review (IPR)
FY16 – 17 Rate Period

Columbia River Fish Mitigation Project

- Purpose: Mitigate impacts of the dams to anadromous fish passage in the Columbia, Lower Snake and Willamette Rivers to meet Biological Opinion (BiOp) requirements:
  - CRFM (Col/Lower Snake River) initiated in 1991
  - Willamette River Basin efforts initiated in 2008
  - Implement fish passage improvements on both systems that were not part of the original dam construction for juvenile and adult fish passage.
- Authority: Original Congressional Acts for project construction and operation
- Funding source: Congressional appropriations. BPA repays U.S. Treasury for "power share" of costs.
- Transfers to "Plant-in-Service":|
  - Costs transferred when new facility goes into operation or study completed

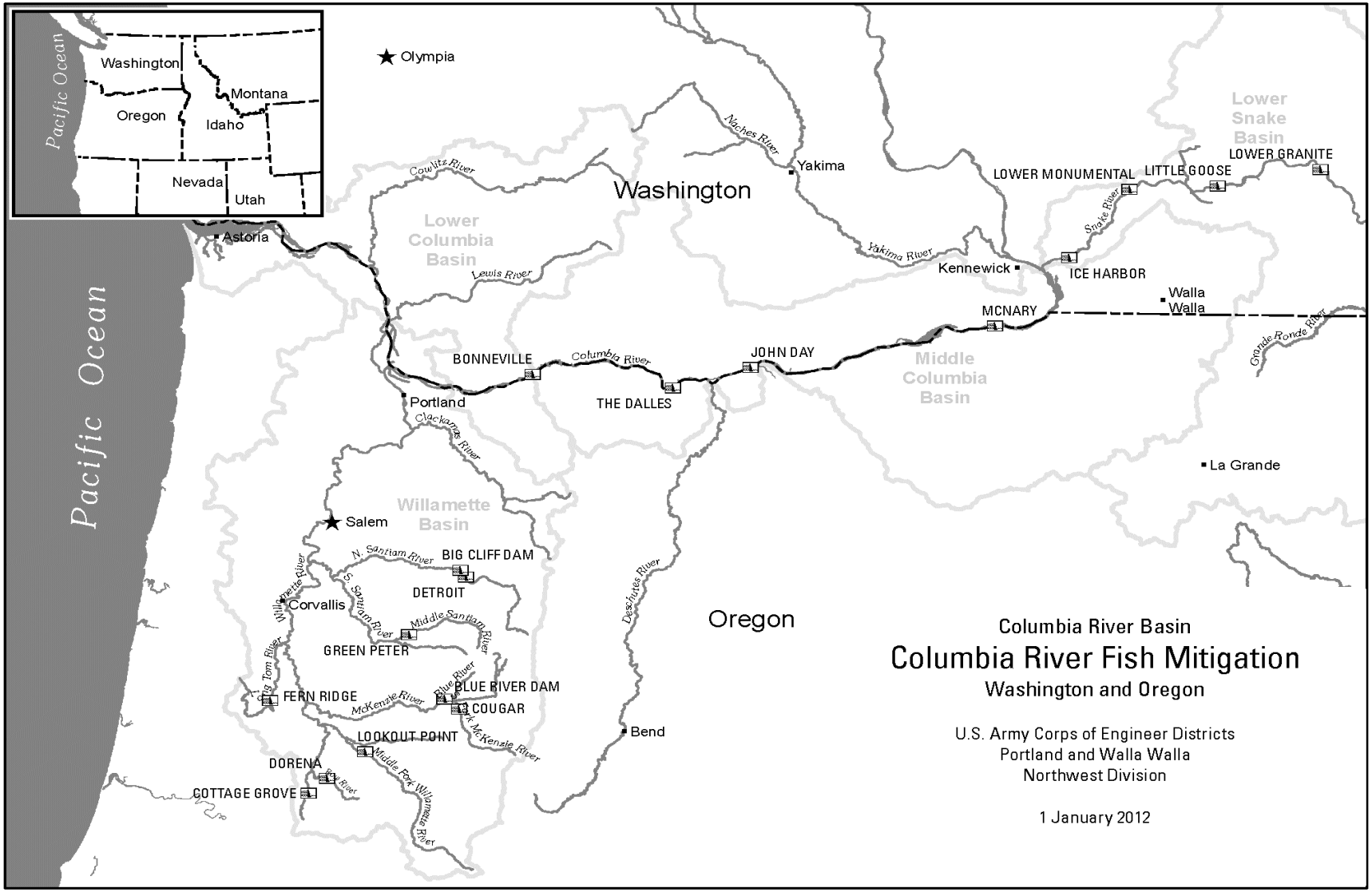
Columbia River Fish Mitigation Project

- Costs and schedule
  - Estimated project cost last reported to Congress: $2.337 B (FCRPS $2.037 B, Willamette $300 M)
    - FCRPS costs increased based on revised estimate prepared in 2012 that considered remaining actions and a cost and schedule risk analysis
    - Willamette costs unchanged and will be re-evaluated as part of a BiOp compliance strategy to be completed in 2015
  - Funds expended through 2013: $1.74 B
  - Current estimated completion: 2023 (Coincides with completion of the the Willamette River Basin BiOp)

Columbia River Fish Mitigation Project

- Primary focus: Facility configuration and operations at the dams that improve fish survival:
  - Evaluate project and system fish passage & survival
  - Identify/develop/construct passage improvements (juvenile and adults)
  - Seek cost effective alternatives, configurations, and operations
  - Implement Biological Opinions and Fish Accord agreements
  - Regional coordination
    - Biological/technical review &input
    - Establish priorities
      - ✓ Critical issues/uncertainties for research
      - ✓ Biological outputs for alternative actions
      - ✓ Costs
- Goals: Implement improvements at the projects to increase fish survival while allowing the continued benefits of the multi-purpose projects (hydropower, navigation, recreation, flood damage reduction).
  - Improve and address impacts to fish survival that were not considered when the dams were originally built.
  - Achieve BiOp juvenile survival performance requirements to achieve recovery of endangered species and stability of hydropower system (96% spring, 93% summer)

Columbia River Fish Mitigation Project



Columbia River Fish Mitigation Project

Annual Appropriations:		Transfers to Plant-in-Service (power share):	
91-99:	$516.6		
2000:	$58.1	2000:	$47.0
2001:	$80.5	2001:	$ 6.2
2002:	$71.2	2002:	$ 8.8
2003:	$82.1	2003:	$68.4
2004:	$66.1	2004:	$62.9
2005:	$75.4	2005:	$51.9
2006:	$84.1	2006:	$352.7
2007:	$95.0	2007:	$56.7
2008:	$82.2	2008:	$36.5
2009:	$105.2*	2009:	$103.2
2010:	$87.6*	2010:	$56.6
2011:	$134.9*	2011:	$47.4
2012:	$128.4	2012:	$101.1
2013:	$82.8	2013:	$95.3
2014:	$102.5		

(Dollars are in millions)

* Includes ARRA Funds

Columbia River Fish Mitigation Project

Estimated annual transfers to Plant-in Service 2014-2018 (Power share)

(Dollars are in millions)

Year:	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
	$79	$137	$95	$62	$39

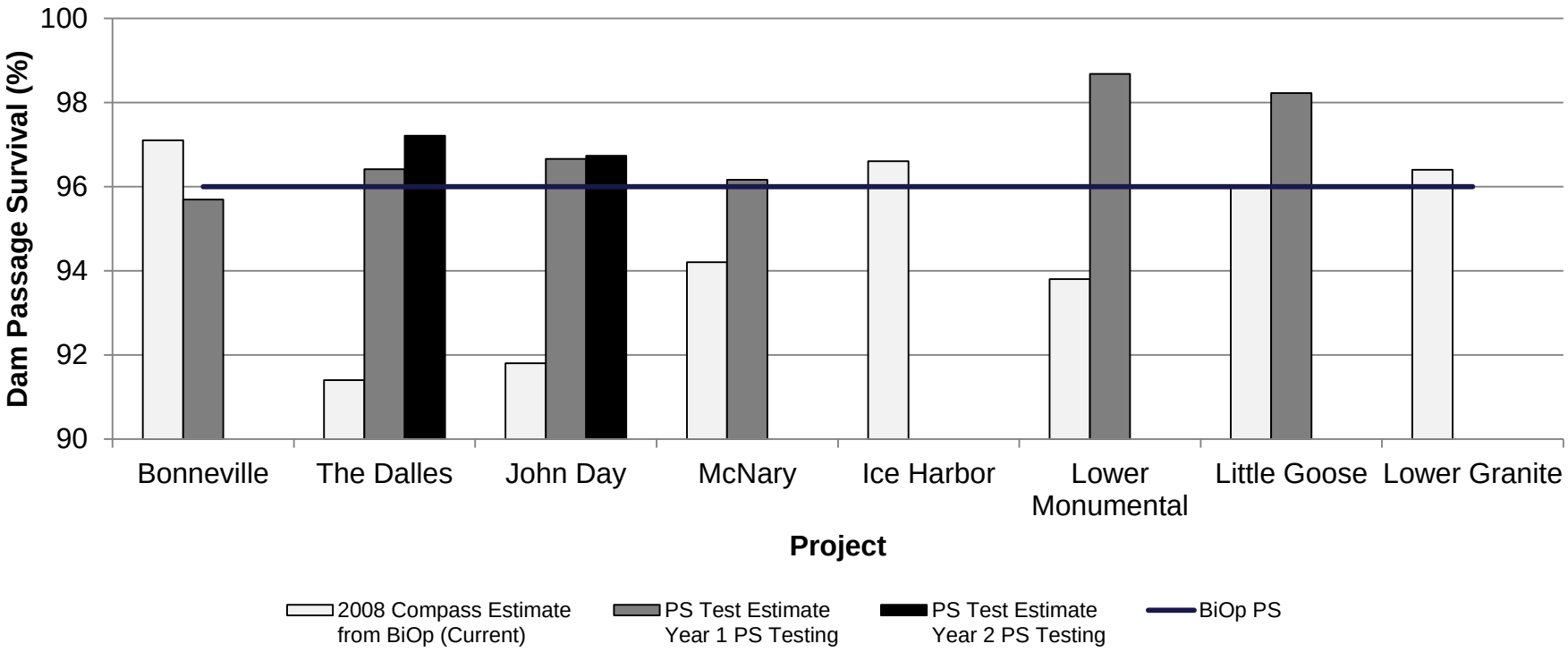
Columbia River Fish Mitigation Project

- Major Remaining Activities:
  - Bonneville Dam:
    - Complete 2nd PH Bypass improvements
    - Complete BIOP performance testing
    - Complete lamprey passage improvements
  - The Dalles Dam:
    - East adult ladder emergency auxiliary water supply
    - Design and construct adult PIT monitoring system
  - John Day Dam:
    - Complete BIOP performance testing
  - McNary Dam:
    - Complete actions for spillway weir permanence
    - Complete BiOp performance testing

Columbia River Fish Mitigation Project

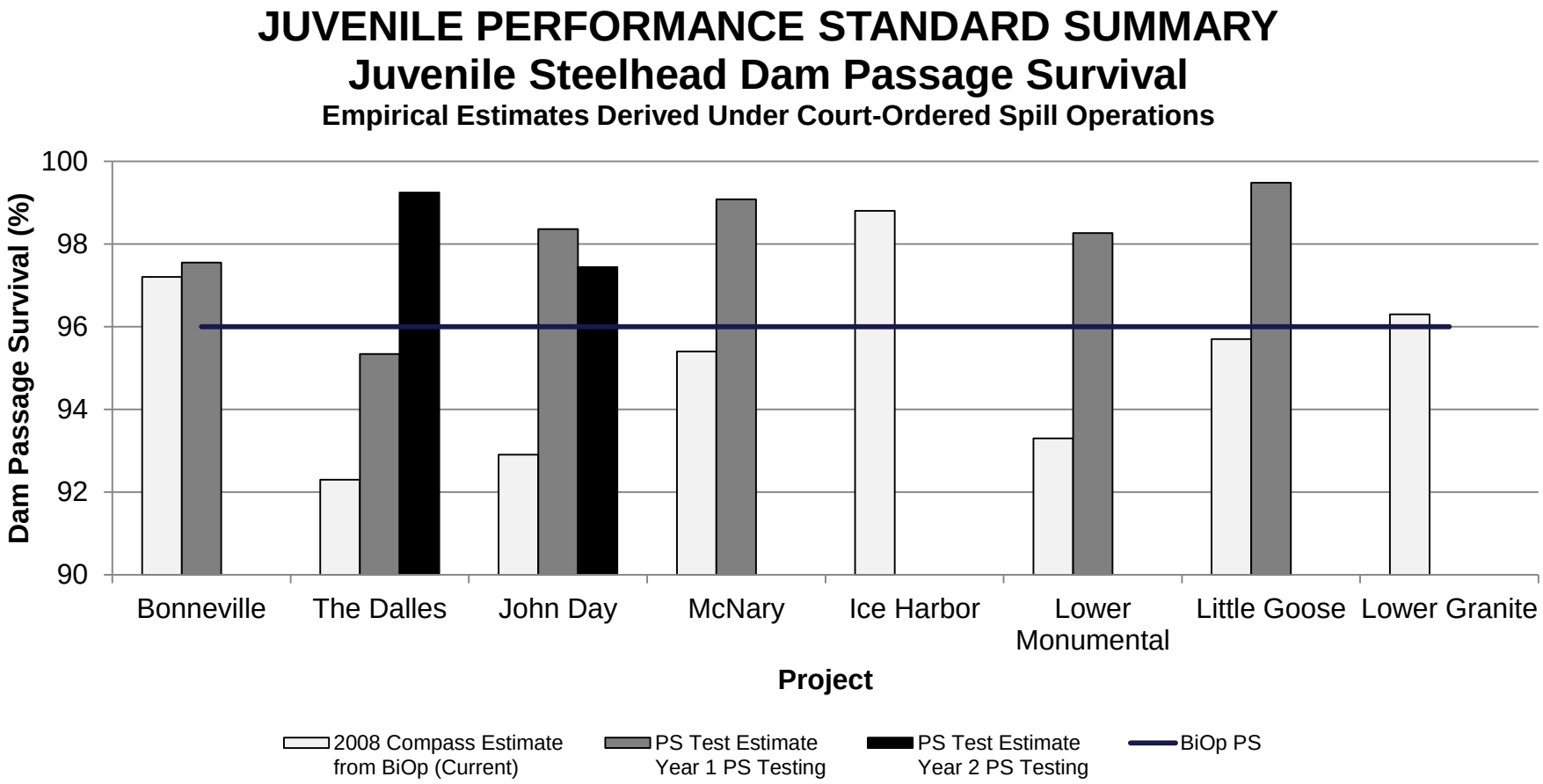
- Major Remaining Activities (Cont):
  - Ice Harbor:
    - Initiate BiOp performance testing
    - RSW spillway chute and deflector modifications
    - Biological input to design and post-installation evaluation of new turbine runners
  - Little Goose:
    - Complete actions for spillway weir permanence
    - Complete BIOP performance testing
  - Lower Granite Dam:
    - Complete design and initiate construction of juvenile bypass facility upgrades
    - Initiate BiOp performance testing
    - Install prototype spillway PIT monitoring system
  - System Actions:
    - Lamprey passage research and passage improvements at various dams
    - Estuary and inland avian predator management actions
    - Estuary post- passage and transport survival studies
    - Estuary habitat monitoring
    - Adult and kelt passage evaluations
    - Design and construct spillway weir boat barriers at various projects

Columbia River Fish Mitigation Project



Note: Yearling Chinook dam passage survival estimates from 2008 BiOp COMPASS modeling vs. performance standard test results to date; Bonneville (2011), The Dalles (2010, 2011), John Day (2011, 2012), McNary (2012), Lower Monumental (2012), Little Goose (2012). Performance standard testing will continue through 2018 to complete two years of testing at each project.

Columbia River Fish Mitigation Project



Note: Juvenile steelhead dam passage survival estimates from 2008 BiOp COMPASS modeling vs. performance standard test results to date; Bonneville (2011), The Dalles (2010, 2011), John Day (2011, 2012), McNary (2012), Lower Monumental (2012), Little Goose (2012). Performance standard testing will continue through 2018 to complete two years of testing at each project.

Columbia River Fish Mitigation Project

- Future – Way Forward :
  - FCRPS BiOp:
    - Complete passage improvements to meet the BiOp juvenile survival performance targets (96% spring and 93% summer). Complete juvenile performance standard evaluations for all Columbia and Lower Snake River projects.
  - Willamette BiOp:
    - Complete adult collection facility improvements. Complete basin-wide evaluation and implement additional actions (juvenile passage and temperature control) that are likely to provide significant biological benefit and improvements to survival within the basin.

Financial Disclosure

This information has been made publicly available by BPA on June 13, 2014 and contains information not reported in agency financial statements.