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September 7, 2022

MEMORANDUM

TO: **Fish and Wildlife Committee Members**

FROM: **Kris Homel, Leslie Bach, and Patty O'Toole**

SUBJECT: **Assessing performance of the Council's Fish and Wildlife Program- Part 1: a 40-year retrospective of program development, continued from August**

BACKGROUND:

Presenters: Kris Homel, Leslie Bach, and Patty O'Toole

Summary: Council staff will present the second half of the status update on assessing performance of the Council's Fish and Wildlife Program. This update begins with a very brief review of the main points from the first half of the status update discussed in August. Next, we describe the development of the program over time in the context of regional events. This description is facilitated by using a common set of terms to categorize each program which can be cross walked back to the 2014 program strategies and associated strategy performance indicators. We will also describe investment in implementation over the last 40 years. Finally, we discuss the approach to assessing performance, topic by topic, in upcoming presentations and we provide a preview of the kinds of information that are instrumental to those upcoming assessments. The presentation will be structured as a workshop, with many breaks for discussion, feedback, and input from Committee members. Examples provided in the presentation will be included in associated products that will provide a more thorough description of program development over time.

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Bill Edmonds
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

Relevance: Beginning with the first program in 1982, every fish and wildlife program has included references to aspects of program performance. The 2009 and 2014 programs expanded on performance with an emphasis on understanding the outcomes from the 40-year investment in fish and wildlife mitigation. The focus on program performance was again reinforced in 2018 by specific direction from Council members to the staff. The 2020 program addendum addresses program performance through (1) reorganizing and compiling the goals and objectives of the program, which serve as benchmarks for performance, and (2) developing strategy performance indicators.

Background: The Northwest Power and Conservation Council's Fish and Wildlife Program represents a 40-year effort to mitigate for the effects of the hydropower system on fish and wildlife in the Columbia Basin. The scope and investment in this Program make it one of the largest fish and wildlife mitigation efforts in the world and a significant part of the tapestry of mitigation efforts in the Columbia Basin. The Program is developed by drawing on regional expertise on how best to mitigate for the construction and operation of the hydrosystem. Consequently, there is an expectation that complete implementation of prescribed actions through investment in mitigation will achieve established objectives and goals.

It is important to note that implementation of the Fish and Wildlife program occurs against a changing backdrop. Even as substantial effort is applied to mitigate for the impacts of the hydrosystem, other human impacts and natural disturbances in the basin produce environmental degradation that can negatively affect ecosystem function or fish and wildlife populations. Accomplishments of the program must be understood and interpreted in the context of these changing environmental conditions.

In August, we began presenting on Part 1 of a five-part assessment. We reviewed the kinds of complexity in the basin and program that must be integrated into an assessment of program performance. These include the dynamic backdrop of the basin, the changes and expansion of the program and associated benchmarks over time, and the amount of time it takes for on-the-ground actions to mature and reach full benefit for fish, wildlife, and habitat. We then described the background of the program, including the legal framework and co-occurring events that precipitated the formation of the Council and the Council's Fish and Wildlife programs. Finally, we reviewed a common set of terms developed to categorize the measures or strategies described in each program so that we could compare work called for in different programs over time. The terms used to categorize programs can all be connected to 2014 strategies and strategy performance indicators (SPIs), such that datasets on outcomes can be linked to the work that was called for in each program over time. Using these terms, we described the development of the program in the 1980s and 1990s in the context of regional and Council events at the time.

In September we pick up where we left off in this history discussion, revisiting a few major highlights from the 1980s and 1990s, and then continuing with the history of program development in the last two decades. An understanding of history and context are key to future assessments of performance because they set the boundaries on the kinds of work that have been called for, where that work occurred, and when the work was implemented. This translates into a more refined understanding of when outcomes from that work might be observable.

Finally, we describe the approach to summarizing parts 2 – 5 of the assessment, which cover the following categories: hydrosystem, habitat, natural production and artificial propagation, and program adaptive management. In each of these parts, we describe the types of actions and projects that have been implemented over time at the scale of the Columbia River Basin/ Fish and Wildlife Program and at the geographic scale of provinces. We draw on datasets assembled for the Strategy Performance Indicators to characterize relationships between what was called for, what was implemented, and what kinds of changes have occurred.

Assessing performance of the Council's Fish and Wildlife Program- part 1: a 40-year retrospective of program development (continued)

Kris Homel, Leslie Bach, and Patty O'Toole

Components of mitigation

Goal
(e.g., 5 million salmon and steelhead)

In-kind, in-place (e.g., hydrosystem modifications)

Replacement
(e.g., artificial propagation)

Offsite
(e.g., tributary habitat restoration)

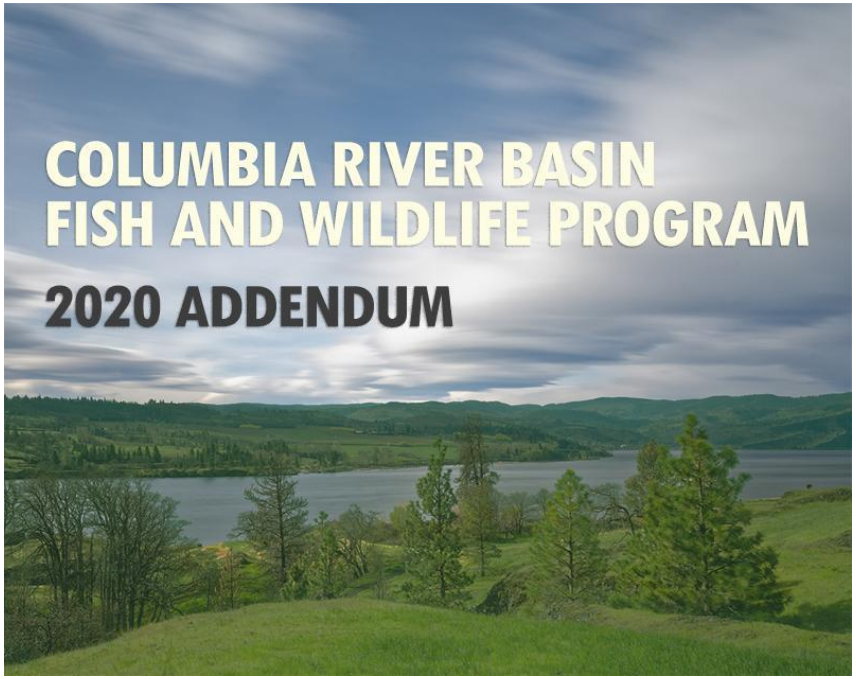
Key point: program is responsible for protection and mitigation for all species affected by hydrosystem, regardless of whether they are ESA-listed

Stool image from clipart-library.com

Focus on performance

- Aspects of performance in every program
- In 2014/2020 Program increased focus toward understanding outcomes from 40 years of investment

- Forms the basis for current efforts on "program performance"



Performance assessment completed in parts

Part 1: Program history, context, and approach to summarizing efforts and accomplishments

Parts 2 – 5: Category assessment [inputs, outputs, and outcomes]

- Hydrosystem
- Habitat
- Natural production and artificial propagation
- Program adaptive management

Key point:

- Assessment focused on ecological changes associated with F&W program

Addressing complexity in performance assessment

Sources of complexity:

- Basin large and geographically and hydrologically complex
- Impacts (hydrosystem and land use) are different across the landscape and among species
  - Complete loss in blocked areas
- Landscape continues to change
- Program varied over time
- Implementation of program has varied geographically and over time

Program development over time in relation to regional events

- Describe by ~ decade
- Timeline of regional events
- Description of program using a common set of categories and themes to characterize programs in consistent way over time

- Recap of examples from 1980s and 1990s
- New examples from 2000s and 2010s
  - Additional detail in documentation (in draft)

Hydrosystem

- Flow/ storage reservoir operations
- Passage
- Water quality
- RM&E

Habitat

- Restoration
- Protection
- Wildlife
- RM&E
- Non-native and invasive species
- Predator management
- O&M for lands

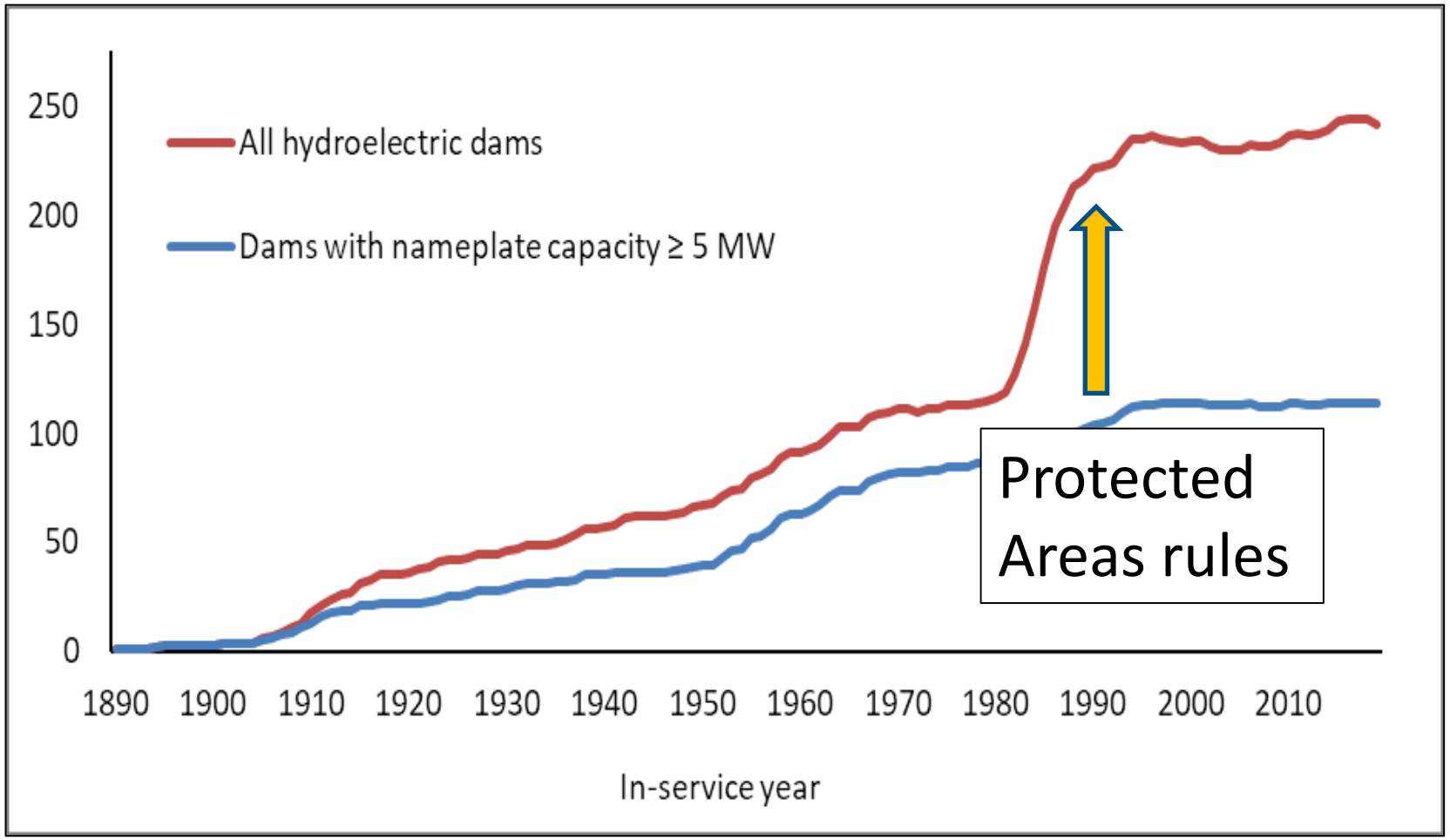
Natural production and artificial propagation

- Facility construction
- Artificial propagation
- Harvest recommendations
- RM&E

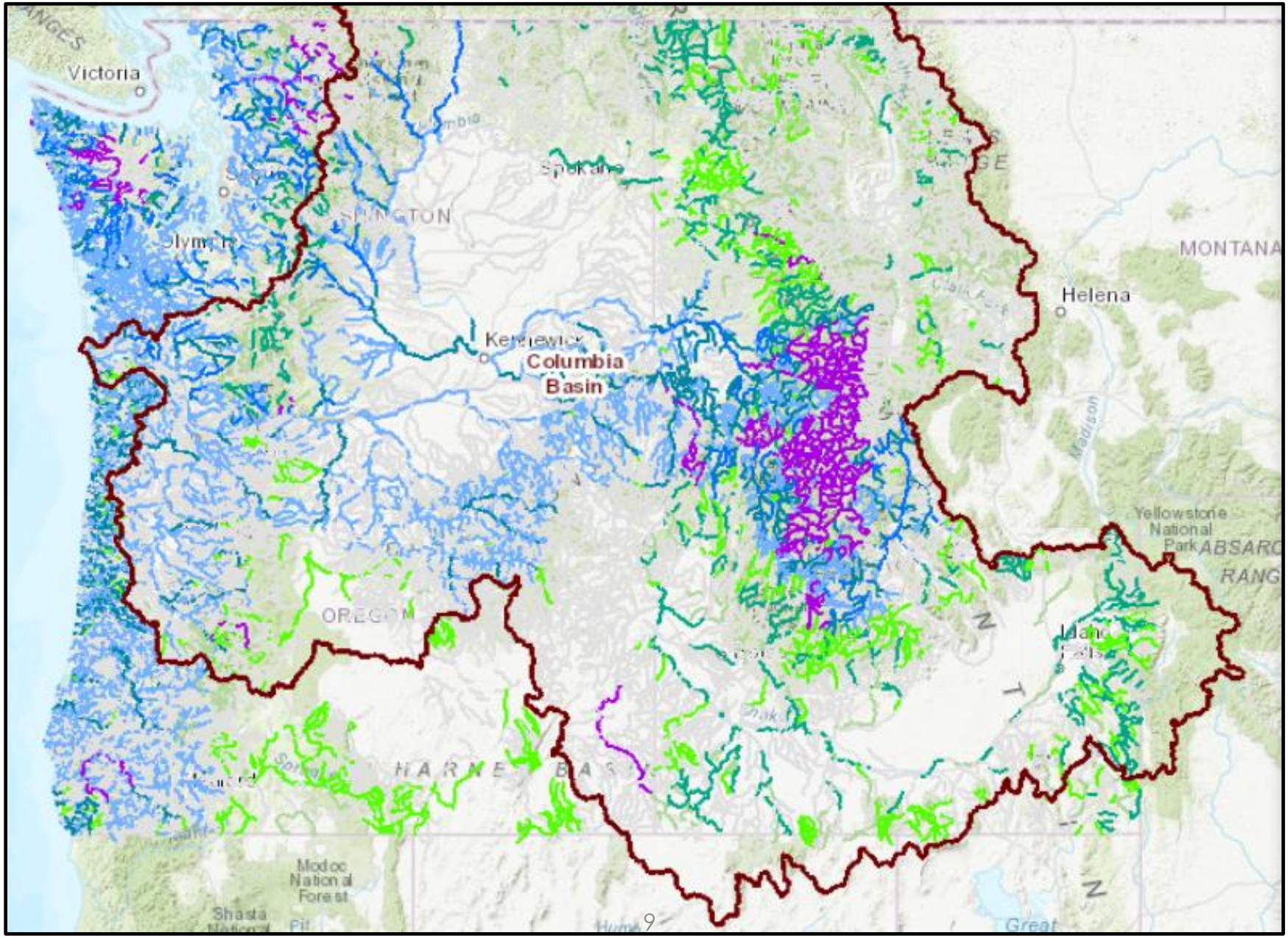
Program adaptive management

- Regional planning
- Data management
- Science review
- Regional coordination
- Public engagement
- RM&E and reporting

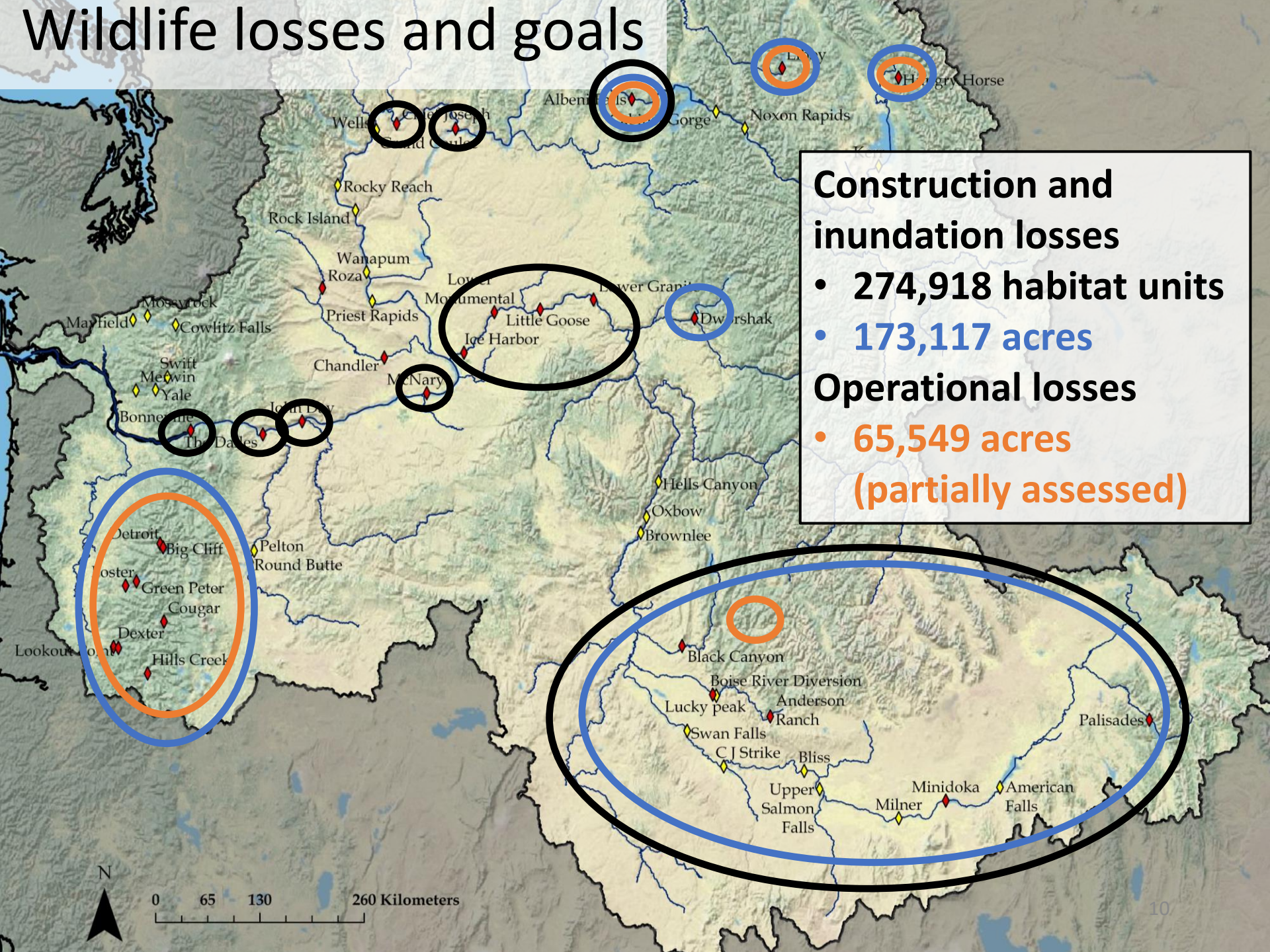
Development of hydrosystem



Protected Areas



Wildlife losses and goals



Construction and inundation losses

- **274,918 habitat units**
- **173,117 acres**

Operational losses

- **65,549 acres (partially assessed)**

5th Program

2000
FCRPS BiOp
Libby Dam Sturgeon BiOp

2002
Mid-Columbia PUDs sign mitigation agreements

Amend 2000 program

2003
NWF v NMFS (2000 FCRPS BiOp is remanded)

Amend 2000 program

2004
FCRPS BiOp

Amend 2000 program

2005
ESA listings:
- Lower Columbia River Coho
- Upper Willamette Chinook

Snake River BiOp
NWF v NMFS (2004 BiOp remanded)

2006
Beginning of court-ordered spill
Libby Dam Sturgeon BiOp
American Rivers V NOAA Fisheries (Snake River BiOp rejected and remanded)

Lawsuit on funding for Fish Passage Center (NEDC v Bonneville)

2007

2008
FCRPS BiOp
Willamette Basin BiOp
US v Oregon BiOp
Columbia Basin Fish Accords

6th program

2009
HSRG report

Amend 2009 program

2010
Supplemental FCRPS BiOp

Amend 2009 program

2011
NWF v NMFS (2010 supplemental BiOp rejected)

2000 - 2011

Program development- 2000s

Year	Description
2000	5th Program
2003	*Mainstem amendments*
2004	*Adopt plans for 23 subbasins*
2005	*Adopt plans for 34 subbasins*
2009	6th Program
2010	*Adopt 1 subbasin plan*
2011	*Adopt 1 subbasin plan*

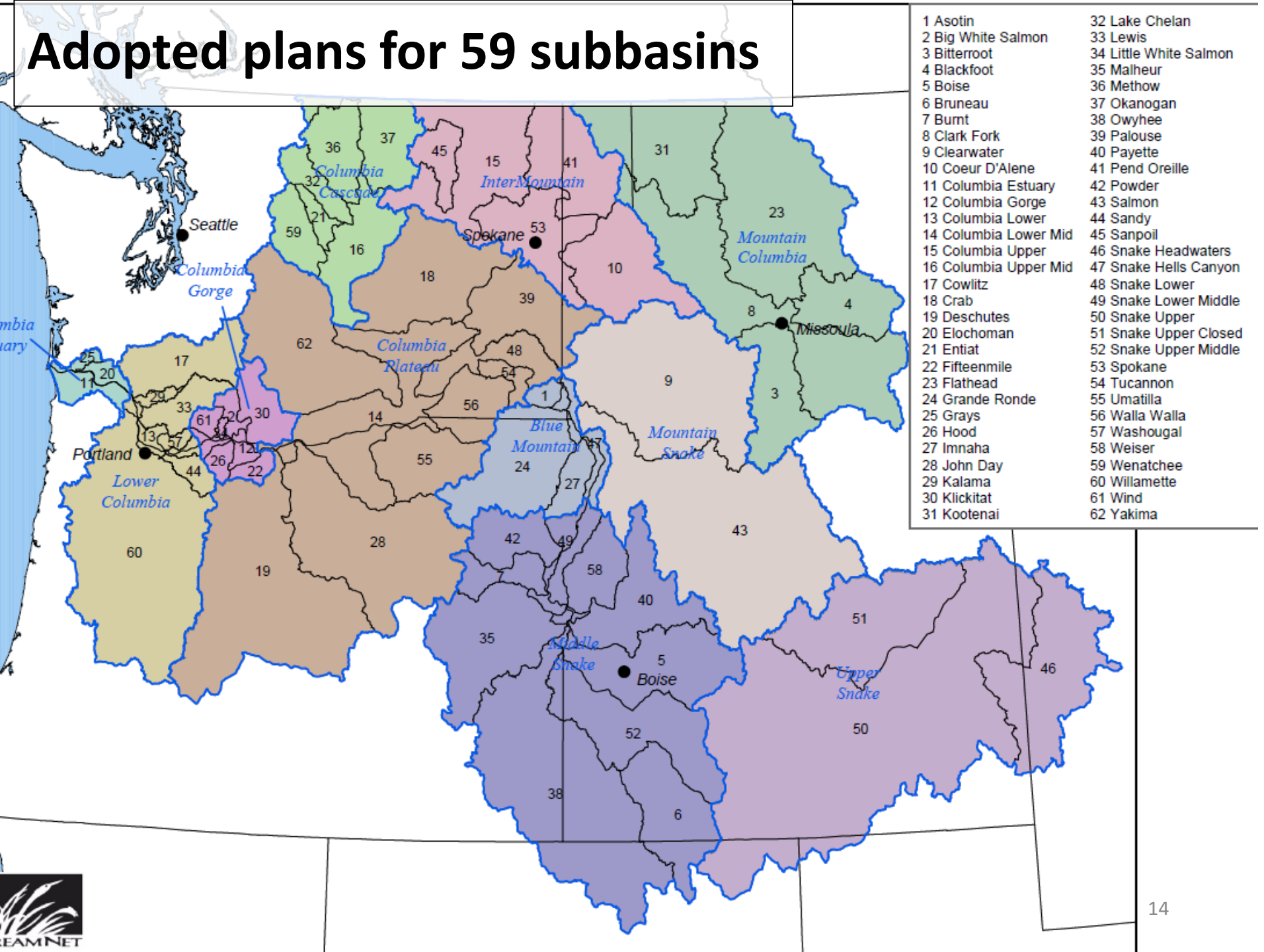
Water Transactions Program

Park Creek before water transactions

Park Creek after water transactions

Source: Clark Fork Coalition, Montana

Adopted plans for 59 subbasins



2012 - 2022

	2012	NMFS authorizes WA, OR, ID to remove up to 92 Sea Lions
	2013	
7th program	2014	Supplemental FCRPS BiOp
	2015	ESA delisting: Oregon Chub
	2016	Judge Simon invalidates 08/10/14 BiOp and remands; orders new BiOp and EIS
	2017	NOAA convenes MAFAC Columbia Basin Partnership Taskforce
	2018	Flex Spill agreement (2019-2021) Columbia River Treaty modernization and renegotiations begin
	2019	FCRPS BiOp
Amend 2014 program with two-part addendum	2020	FCRPS BiOp CRSO EIS
	2021	FCRPS BiOp litigation resumes and then halted as settlement talks progress through White House Council on Environmental Quality
	2022	Murray-Inslee process evaluating breaching of Lower Snake River dams Numerous LSRD power replacement studies occur NOAA Science Report on Salmon and Steelhead recovery

Program development- 2010s

Year	Description
2014	7th Program
2020 part 1	*Goals, objectives, and strategy performance indicators*
2020 part 2	*Near-term priorities*

Goals, objectives, strategy performance indicators

17

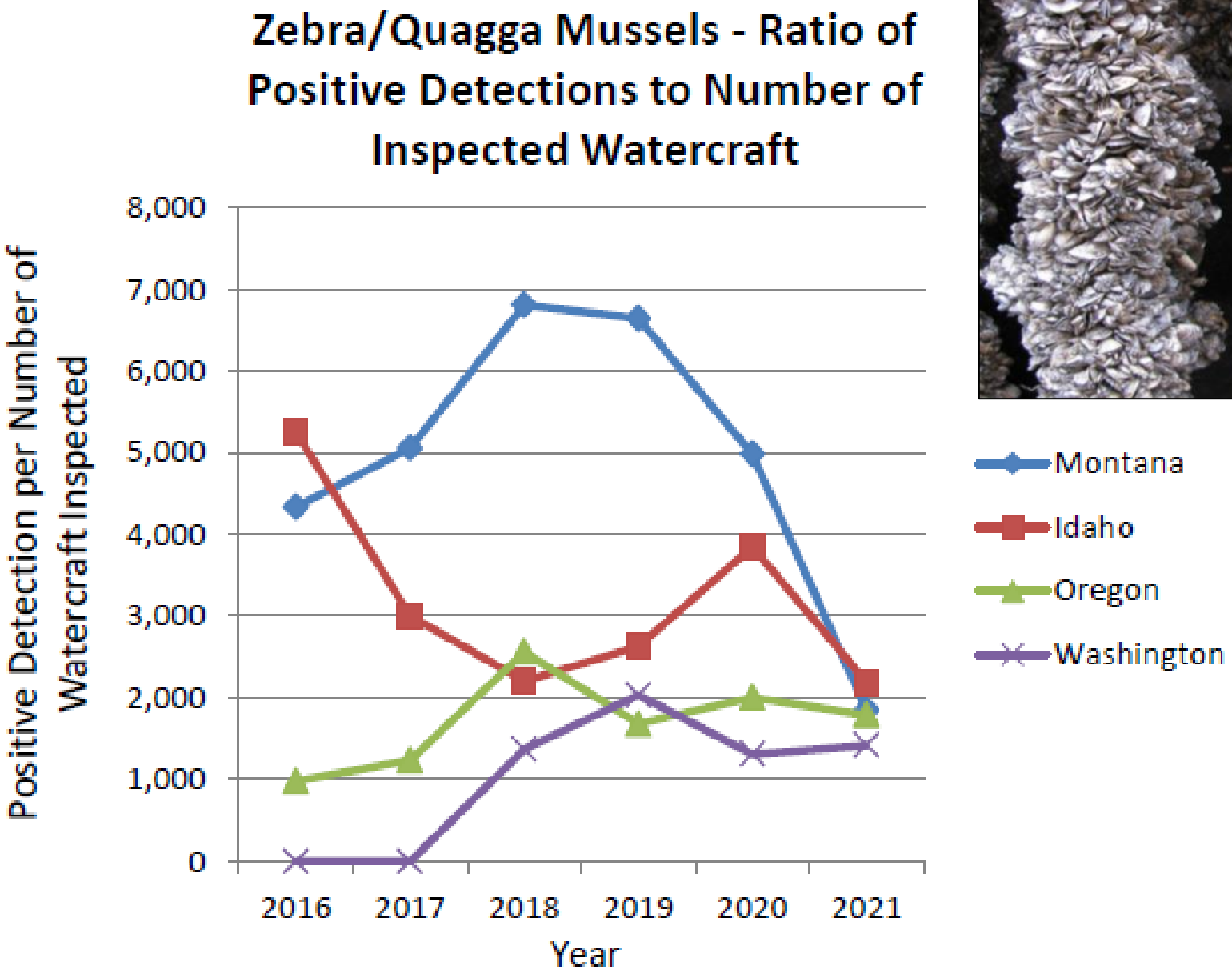
2014 Emerging priorities

- Fund long term maintenance
- Project effectiveness, program objectives, climate change
- Predator management, toxic contaminants, non-native and invasive species
- Blocked area mitigation options
- Additional sturgeon and lamprey measures
- Update the subbasin plans
- Improve floodplain habitat

2020 Near term priorities

- Green bullets above re-emphasized
- Ocean
- Estuary
- Mainstem hydrosystem flow and passage operations

Invasive species



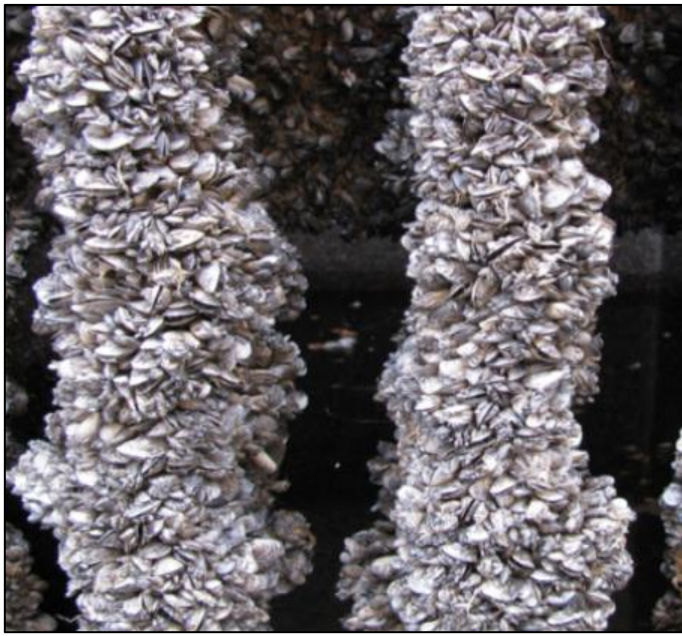
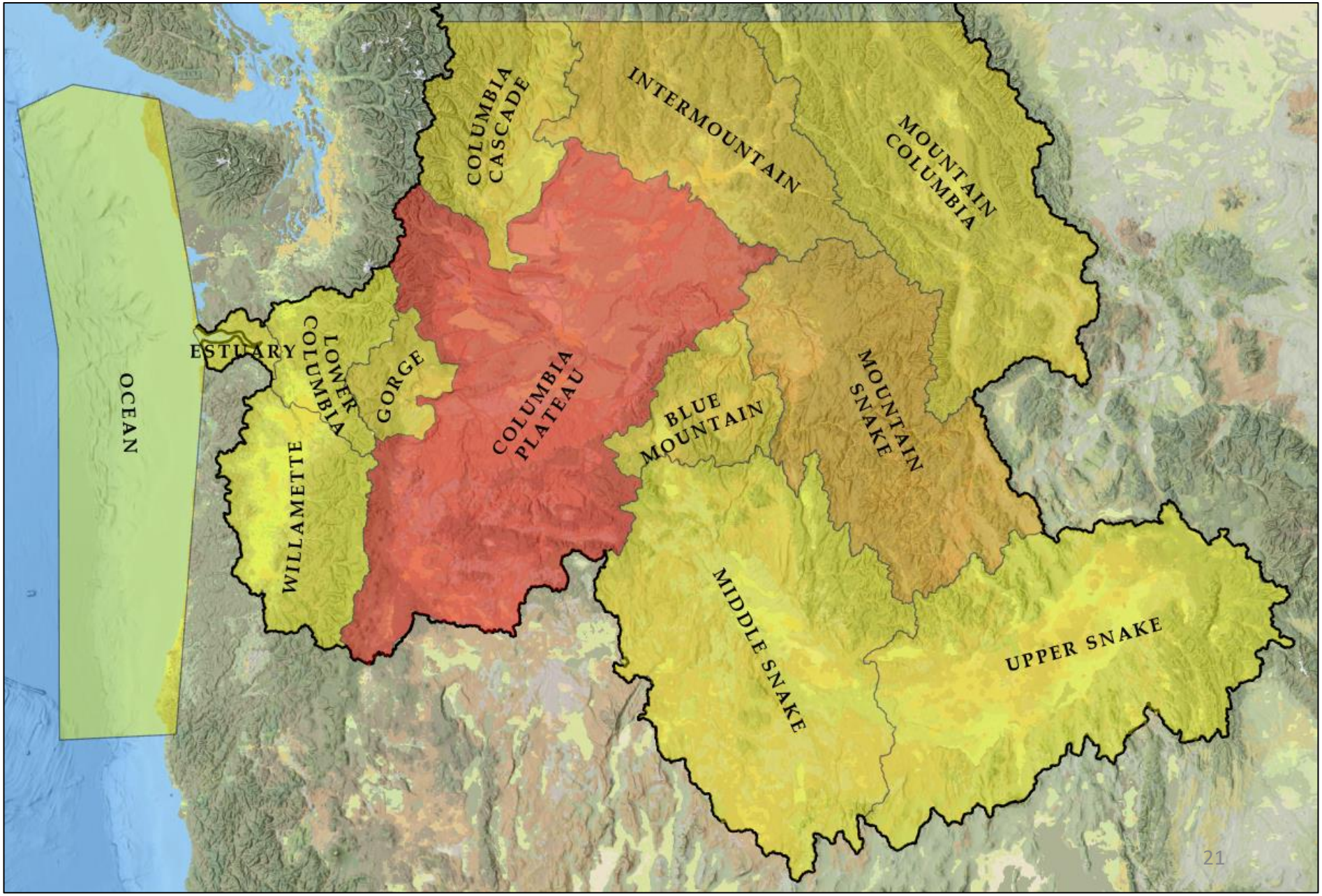


Photo: Washington Invasive Species Council

Questions on program development?

Preview- 40 years of implementation



Program funding

BPAs Reimbursable Program

Congressionally appropriated capital investment repayment

Reimbursable Operations and Maintenance Expenditures

Army Corps of Engineers

Columbia River Fish Mitigation Program (CRFM):

Capital construction and research projects for mainstem dam fish passage improvements

Operations and maintenance:

- Dam Facility O&M
- Wildlife Mitigation

- Hatcheries:
Dworshak
John Day Mitigation
Willamette Mitigation

Anadromous Fish Evaluation Program (AFEP)

Fish and Wildlife Service

Lower Snake River Compensation Plan Hatcheries

Bureau of Reclamation

Leavenworth Hatchery Complex

BPAs Direct Program

Columbia River Fish and Wildlife Program

Program includes: NMFS and USFWS Biological Opinions for Salmon, Steelhead, Kootenai River White Sturgeon, Bull Trout

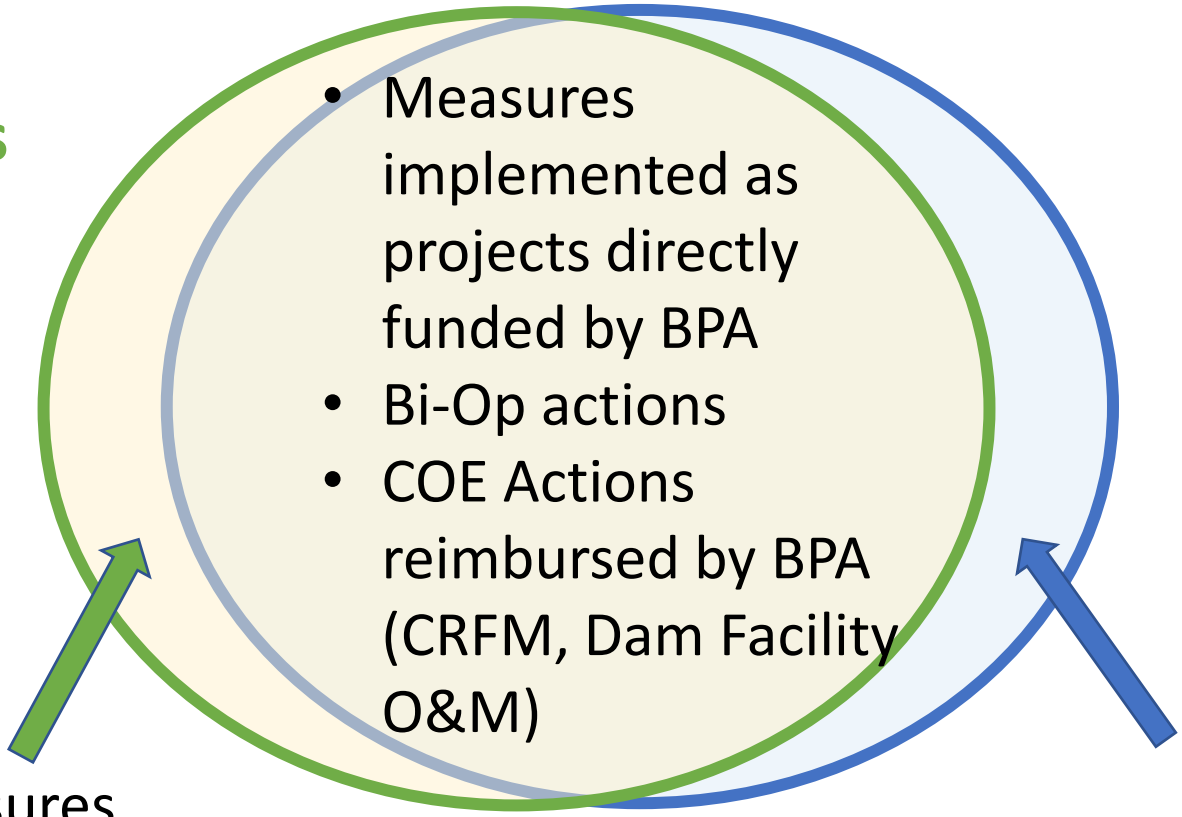
CRSO and EIS costs

BPAs overhead costs

50% of NPCC budget

Council program also includes actions (e.g., hydrosystem operations [COE and BOR] and relicensing considerations and protections [FERC]) and other work not funded by BPA

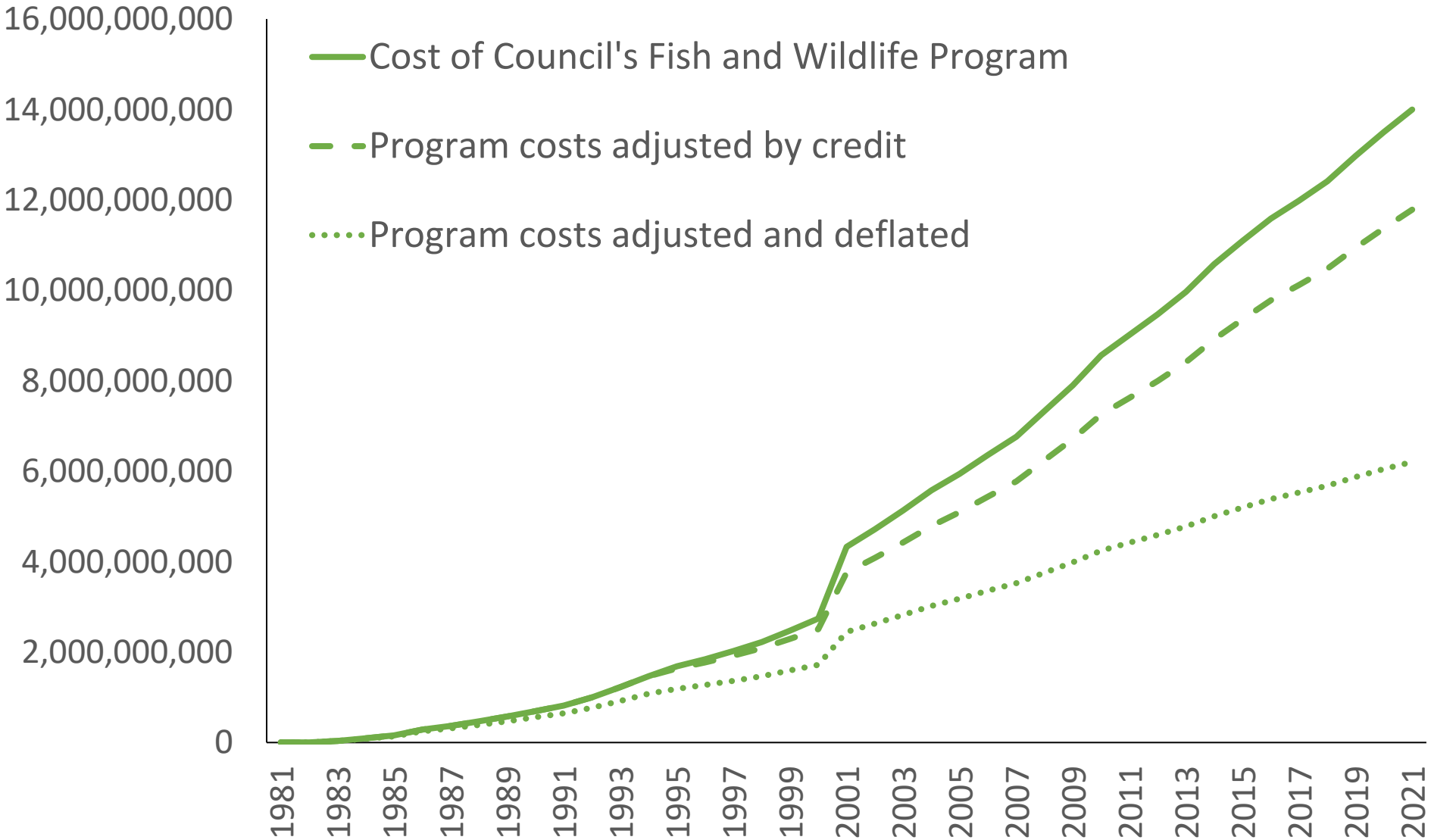
Council and BPA programs substantially overlap



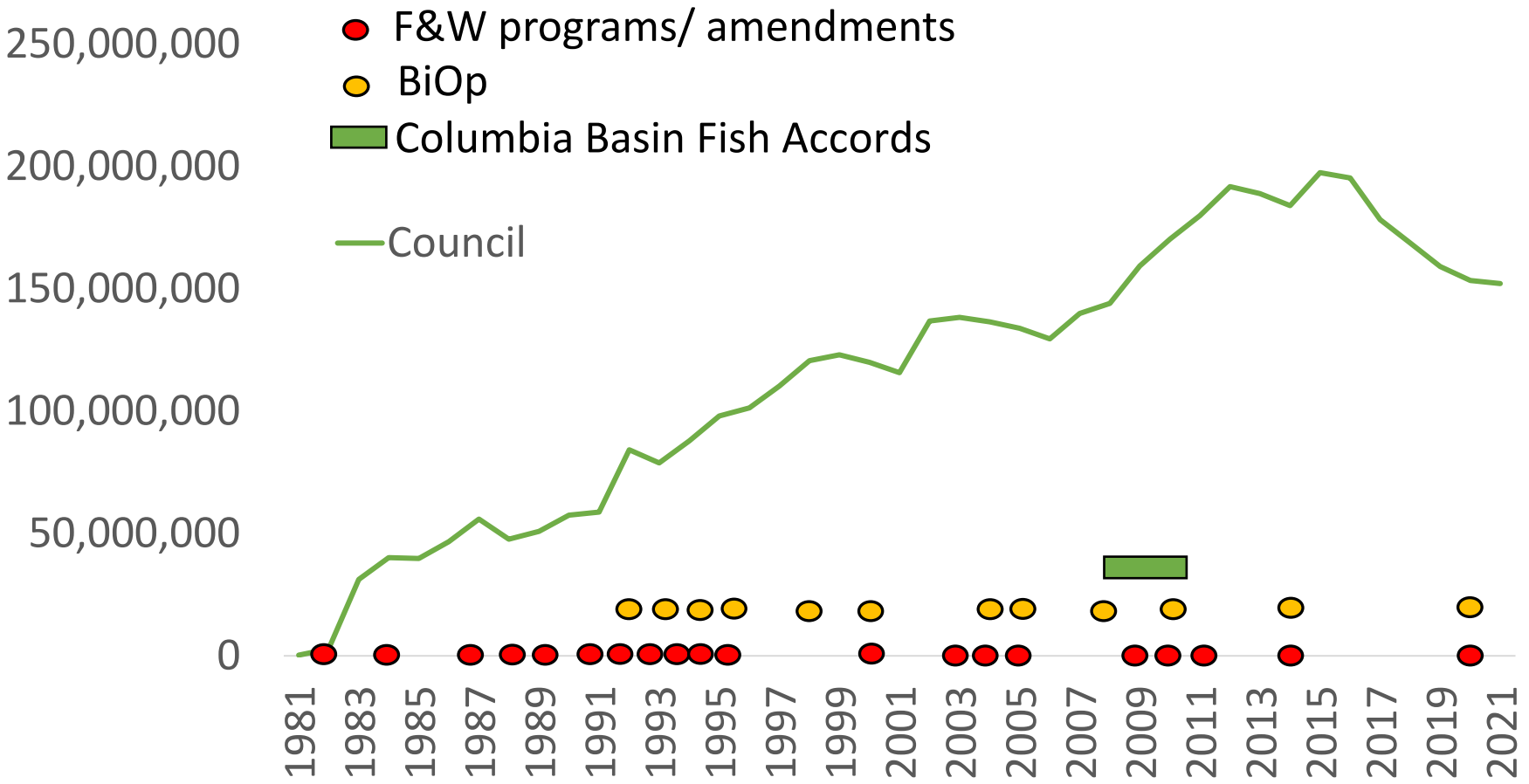
- Measures implementing actions not reimbursed by BPA (e.g., FERC)
- Council actions

- BOR, COE, and FWS hatcheries authorized outside of NPCC program and reimbursed by BPA
- O&M of above hatcheries
- Internal work

Cumulative investment



Annual variation in costs in relation to events



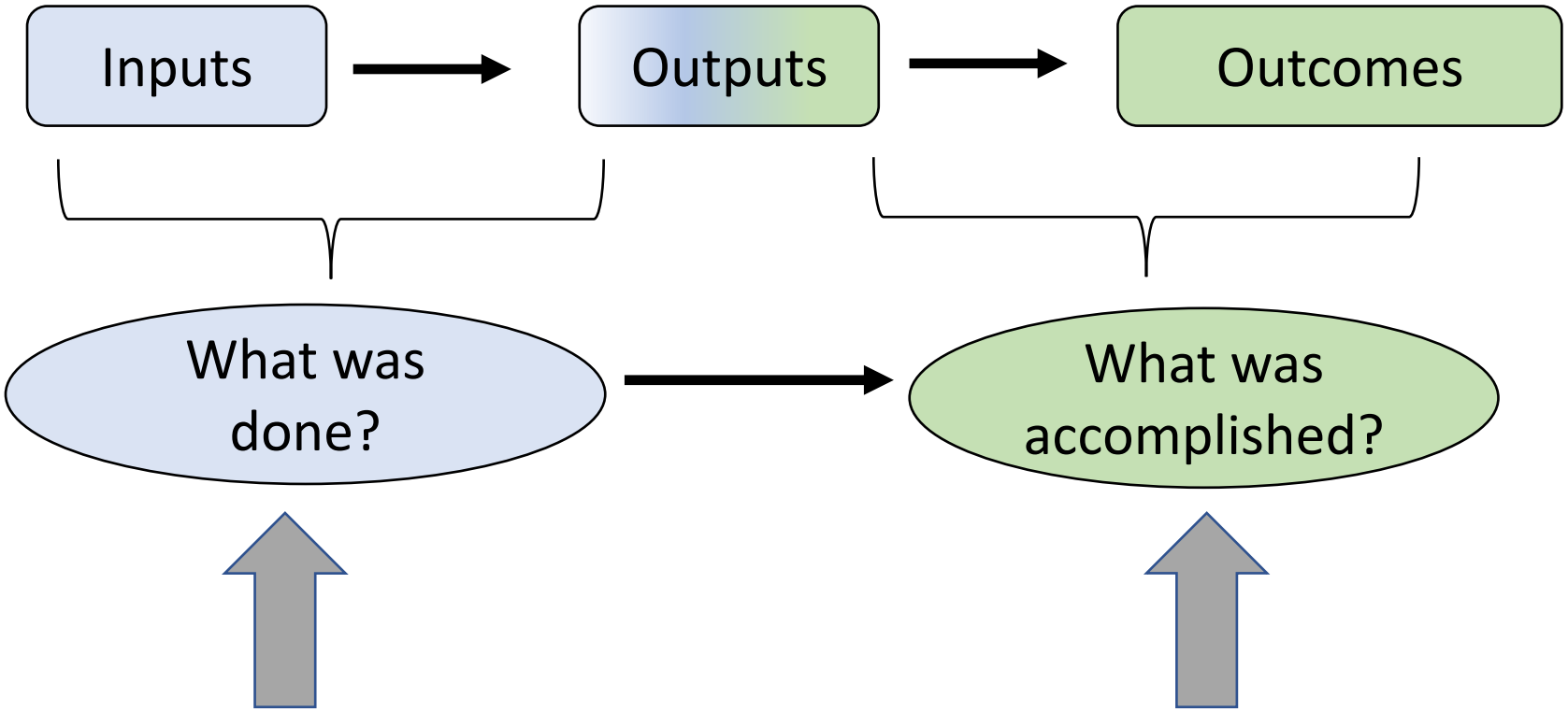
Direct program, fixed expense, reimbursables, all adjusted for inflation

Questions on investments?

Approach for Performance Assessment parts 2 - 5

- Methods
  - Inputs- outputs- outcomes
  - Categories- themes- details
  - Categories and themes link to strategies; strategies link to SPIs
  - Additional physical and biological changes
- Organizational Structure
  - Basinwide, province scales
  - Mainstem
  - By decade
- Products
  - Summaries, maps and graphics, interactive content (level of detail may change among categories and themes)
  - Key policy issues, information gaps, recommendations (for the next program), metadata

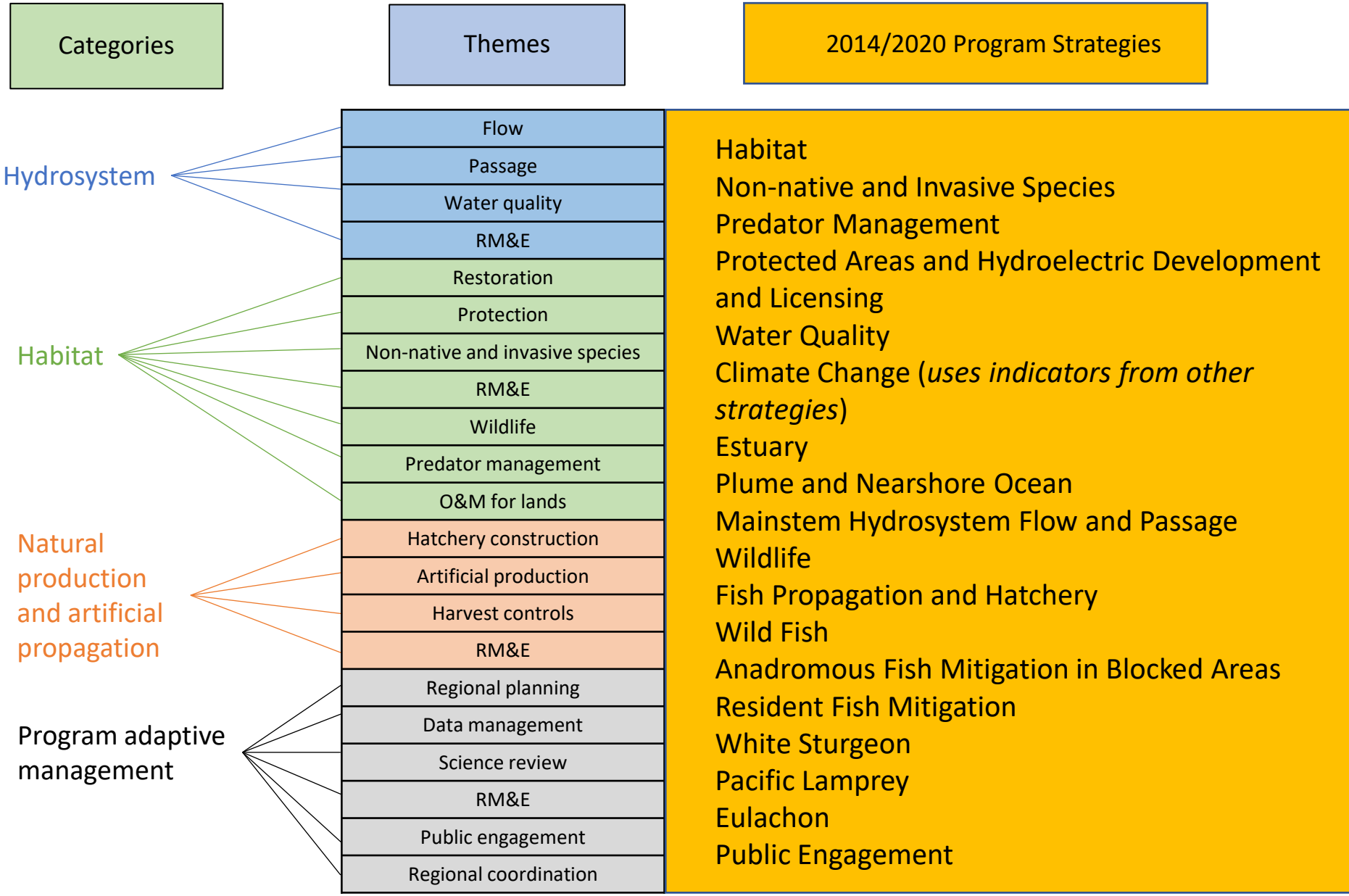
Steps to performance assessment



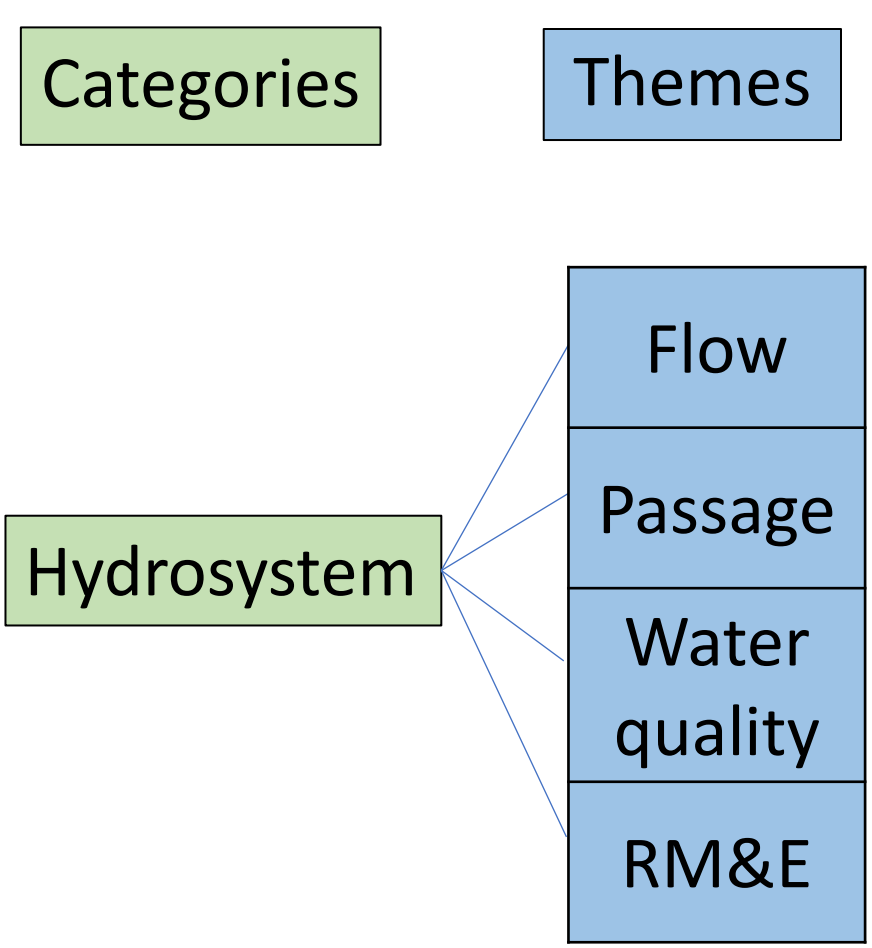
Retrospective
Action Implementation
Program Investment

Physical and Biological Change (over space and time)
Effectiveness of Program Strategies (SPIs)
Progress Toward Goals and Objectives


Categories
Themes
2014/2020 Program Strategies
Strategy Performance Indicators


Categories
Themes
2014/2020 Program Strategies
Hydrosystem
Habitat
Natural production and artificial propagation
Program adaptive management
Flow
Passage
Water quality
RM&E
Restoration
Protection
Non-native and invasive species
RM&E
Wildlife
Predator management
O&M for lands
Hatchery construction
Artificial production
Harvest controls
RM&E
Regional planning
Data management
Science review
RM&E
Public engagement
Regional coordination
Habitat
Non-native and Invasive Species
Predator Management
Protected Areas and Hydroelectric Development and Licensing
Water Quality
Climate Change (uses indicators from other strategies)
Estuary
Plume and Nearshore Ocean
Mainstem Hydrosystem Flow and Passage
Wildlife
Fish Propagation and Hatchery
Wild Fish
Anadromous Fish Mitigation in Blocked Areas
Resident Fish Mitigation
White Sturgeon
Pacific Lamprey
Eulachon
Public Engagement

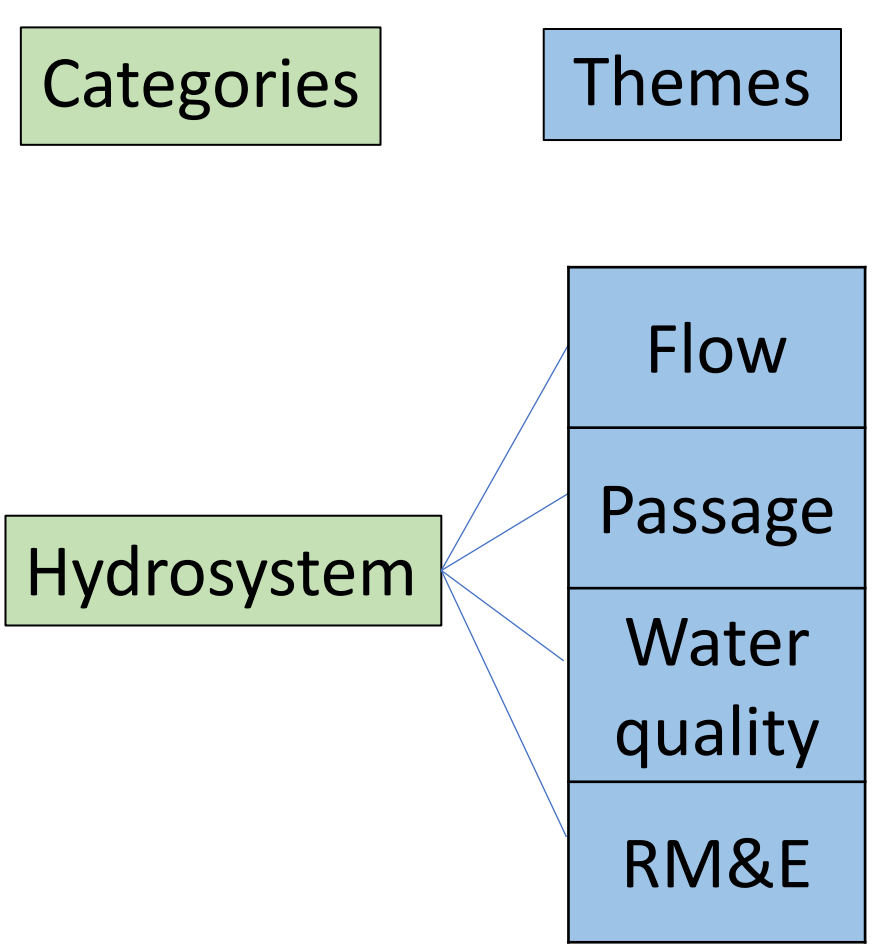
Mapping SPIs to Categories and Themes - Hydrosystem Example



2014/2020 Program Strategies

- Mainstem hydrosystem flow and passage operations
- Water quality
- Resident fish mitigation
- White Sturgeon
- Lamprey
- Blocked areas

Mapping SPIs to Categories and Themes - Hydrosystem Example



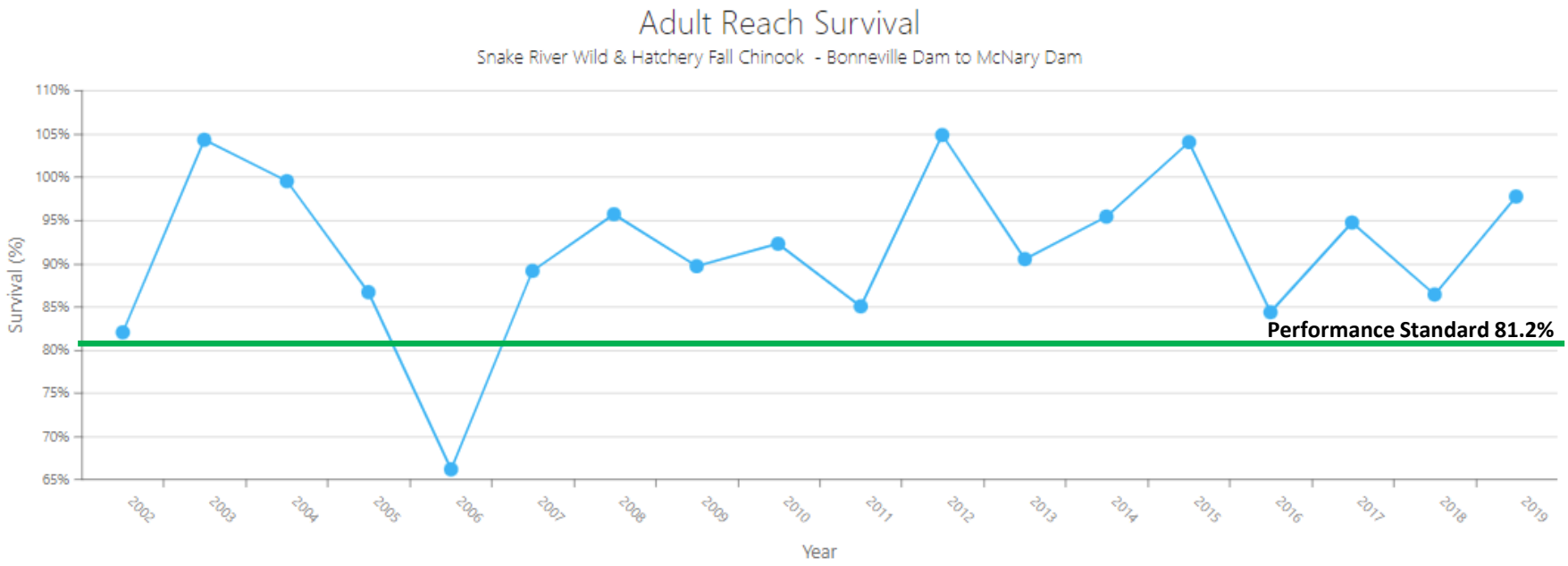
2014/2020 Program Strategies

- Mainstem hydrosystem flow and passage operations
- Water quality
- Resident fish mitigation
- White Sturgeon
- Lamprey
- Blocked areas

Northwest Power and Conservation Council
Program Tracker

Home Performance Data Stories Resources

Annual adult salmon and steelhead survival in select Columbia and Snake River reaches. (S4-1) (Show Data)



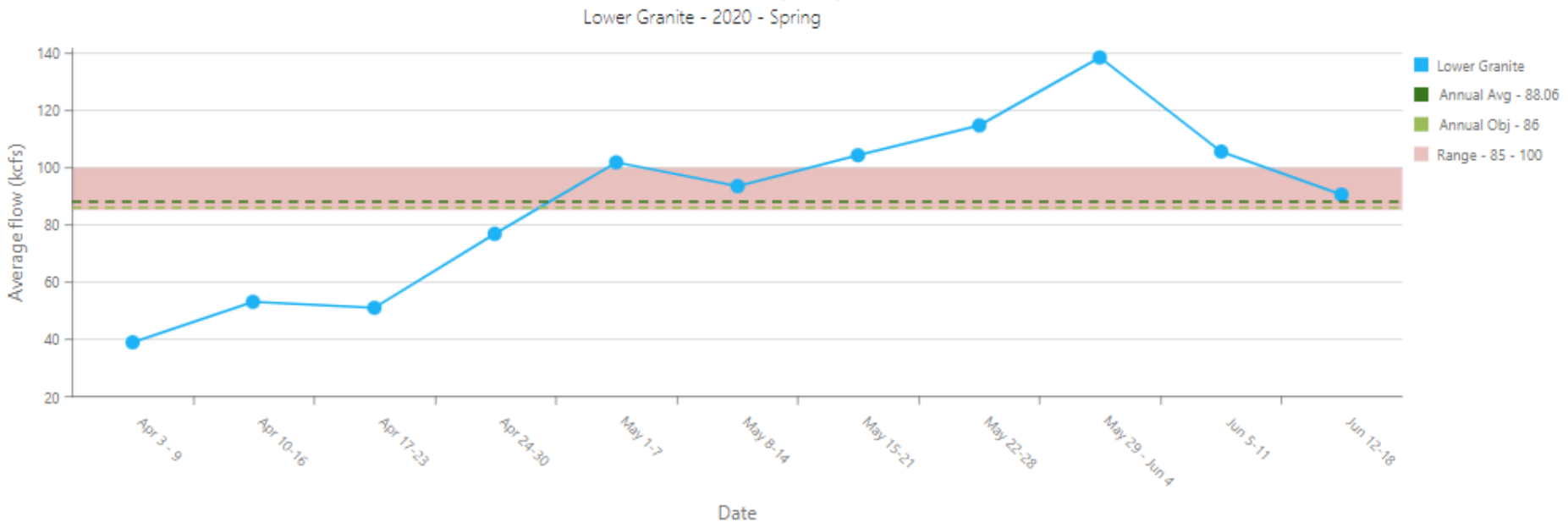
Notes:

1. Conversion rates higher than 100 percent are possible if estimates of harvest rates (or natural rates of straying) are higher than what actually occurred in a given year.

Context, Metadata, and Sources

Data as of 11/15/2021

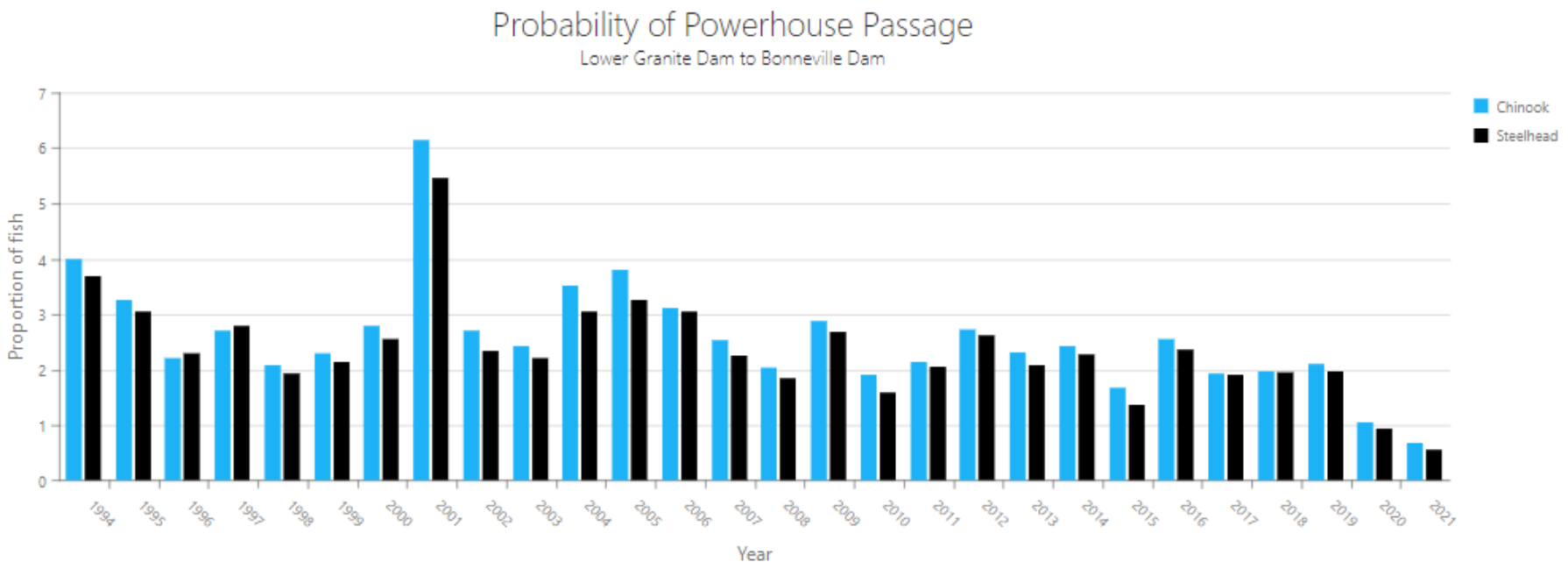
Seasonal flows at specified Columbia and Snake River dams with associated target flows from BiOp and Water Management Plan. E3-1 (Show Data)



Notes:

1. 2020 BiOp Flow Objectives: Spring - Lower Granite Dam (86 cfs), McNary Dam (235 cfs), Priest Rapids Dam (135 cfs) Summer - Lower Granite Dam (51 cfs), McNary Dam (200 cfs), Priest Rapids Dam - No objective

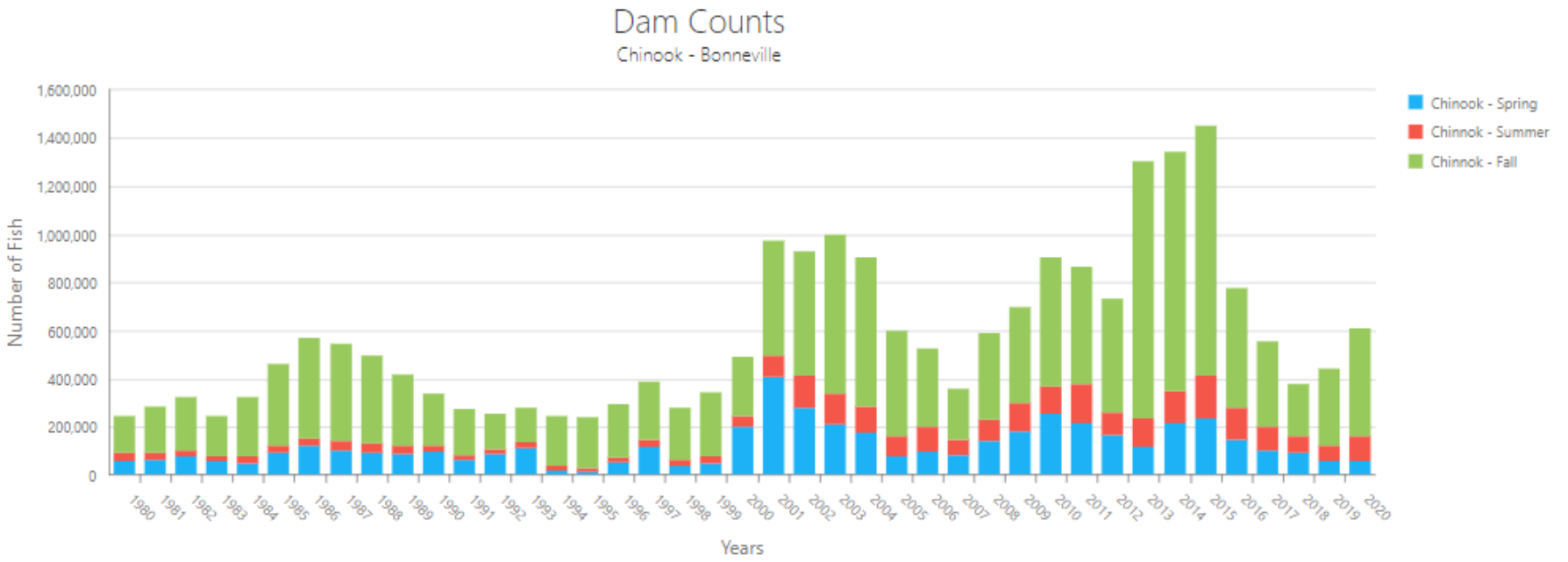
Powerhouse encounter rates from Lower Granite Dam to Bonneville Dam. S3-1 (Show Data)



Notes:

1. PITPH estimates the proportion of fish passing via the powerhouse at each dam, based on the relationship between spill proportion and proportion of the juvenile population that would pass via the turbines and bypass at the dam. Additional background information can be viewed at https://www.fpc.org/documents/CSS/2020-CSS-Report.pdf

Total Bonneville Dam, Lower Granite Dam and Willamette Falls adult counts. (S1-5) (Show Data)



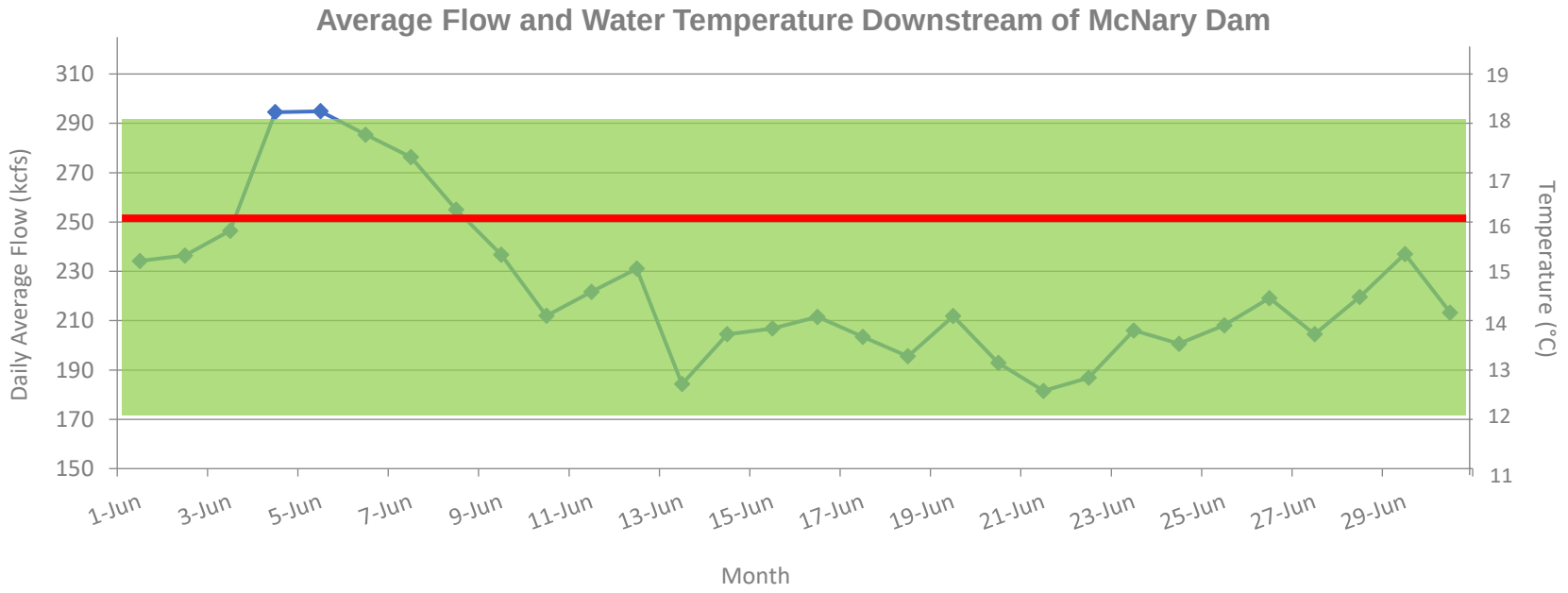
Notes:

1. Chinook counts include adults and jacks

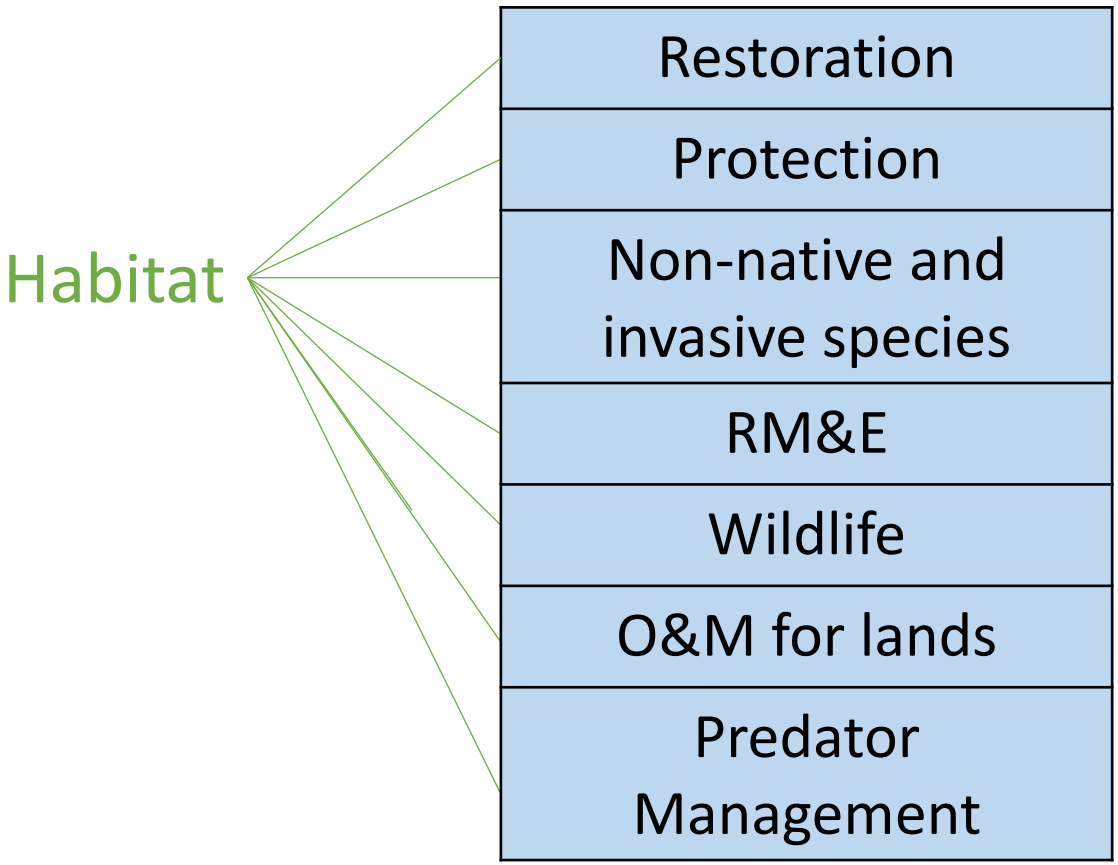
Context, Metadata, and Sources

Data as of 11/15/2021

Daily average flows and water temperatures downstream of McNary Dam in reference to flow and spawning temperature needs for Columbia River White Sturgeon. (E3-4, WS1-2, WS4-2) (Show Data)



Mapping SPIs to Categories and Themes - Habitat Example



Many strategies contain habitat elements. Ongoing mapping of strategies to Habitat category and themes.

Habitat category

- Assembling complete list of Habitat implementation
  - Electronic list of projects
  - Earlier projects not in database
- Reviewing CBFish data
- Supplementing and/or revising original SPIs to reflect available information
- Developing methods to describe habitat change

Status and update on SPIs

- Completed data compilation for majority of 104 SPIs with currently available data
- Migrating datasets into Program Tracker to be completed by December 2022
- Reviewed all SPIs with workgroup (September 12)
- Developing contextual information and metadata for each indicator
- Investigating options for data/sources for remaining SPIs

Approach and next steps

- Common set of categories and themes to characterize programs in consistent way over time
- Performance Assessment will occur by category
- For each category will assess:
  - Physical and biological change over space and time
  - Effectiveness of Program Strategies (SPIs)
  - Progress toward goals and objectives
- Hydrosystem and habitat assessed next

Products

- Summaries, maps and graphics, interactive content (level of detail may change among categories and themes)
- Key policy issues, information gaps, recommendations (for the next program), metadata

Thank you

- BPA and Corps staff provided investment data
- Council staff provided database of hydro projects, reviewed history information, and developed a list of projects implemented prior to CBfish
- Fish and wildlife managers provided data on SPIs
- QW summarized and provided visualizations for SPIS

Questions?