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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.

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.

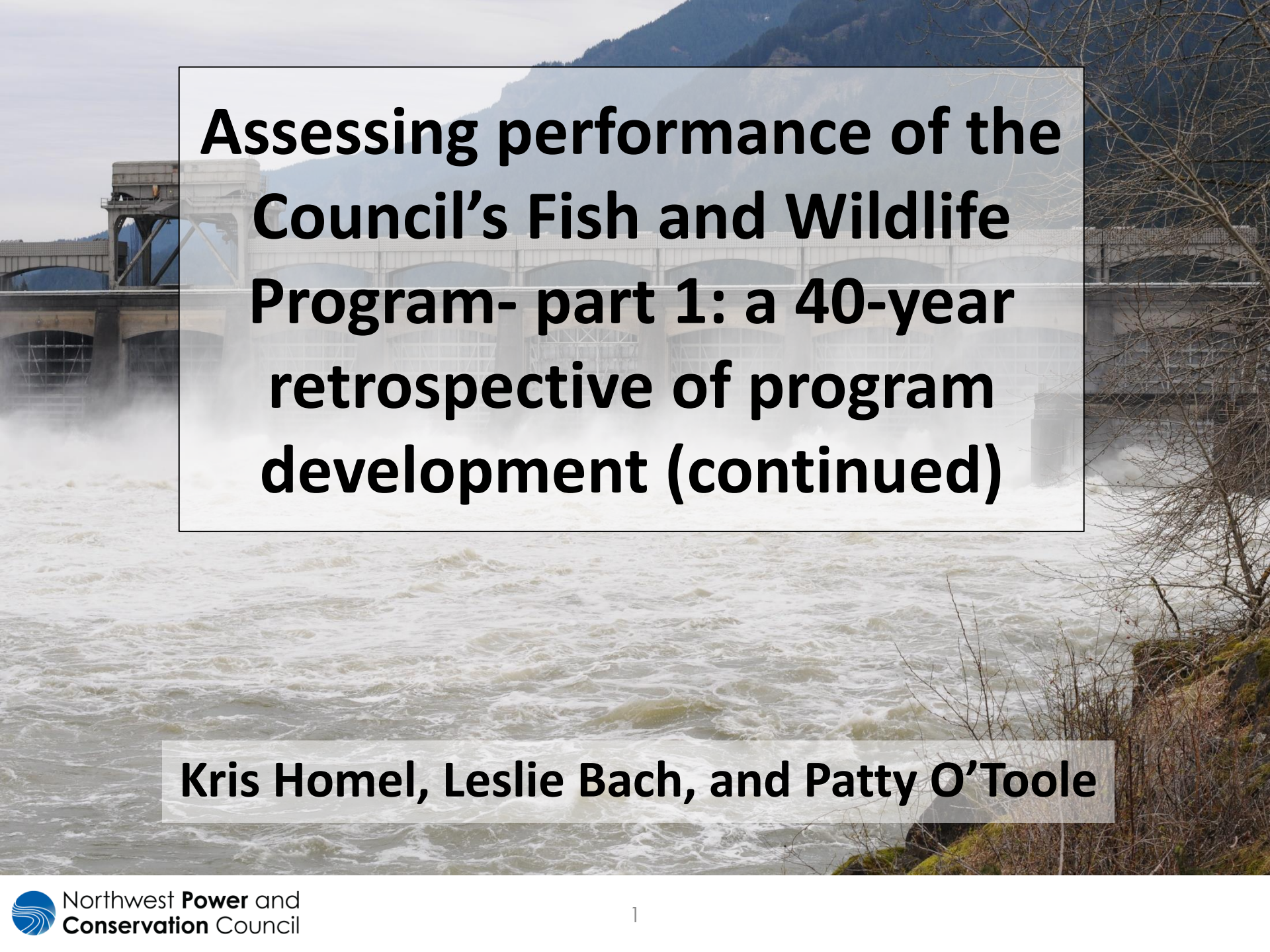
Background: The Northwest Power and Conservation Council's Fish and Wildlife Program represents a 40-year effort to mitigate for the effects of the hydropower system on fish and wildlife in the Columbia Basin. The scope and investment in this Program make it one of the largest fish and wildlife mitigation 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.

The background of the slide is a photograph of a large concrete dam with multiple arches. In the foreground, the river flows rapidly, creating white water rapids. The sky is overcast, and some bare trees are visible on the right side of the frame.

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)

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

Offsite
(e.g., tributary habitat restoration)

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

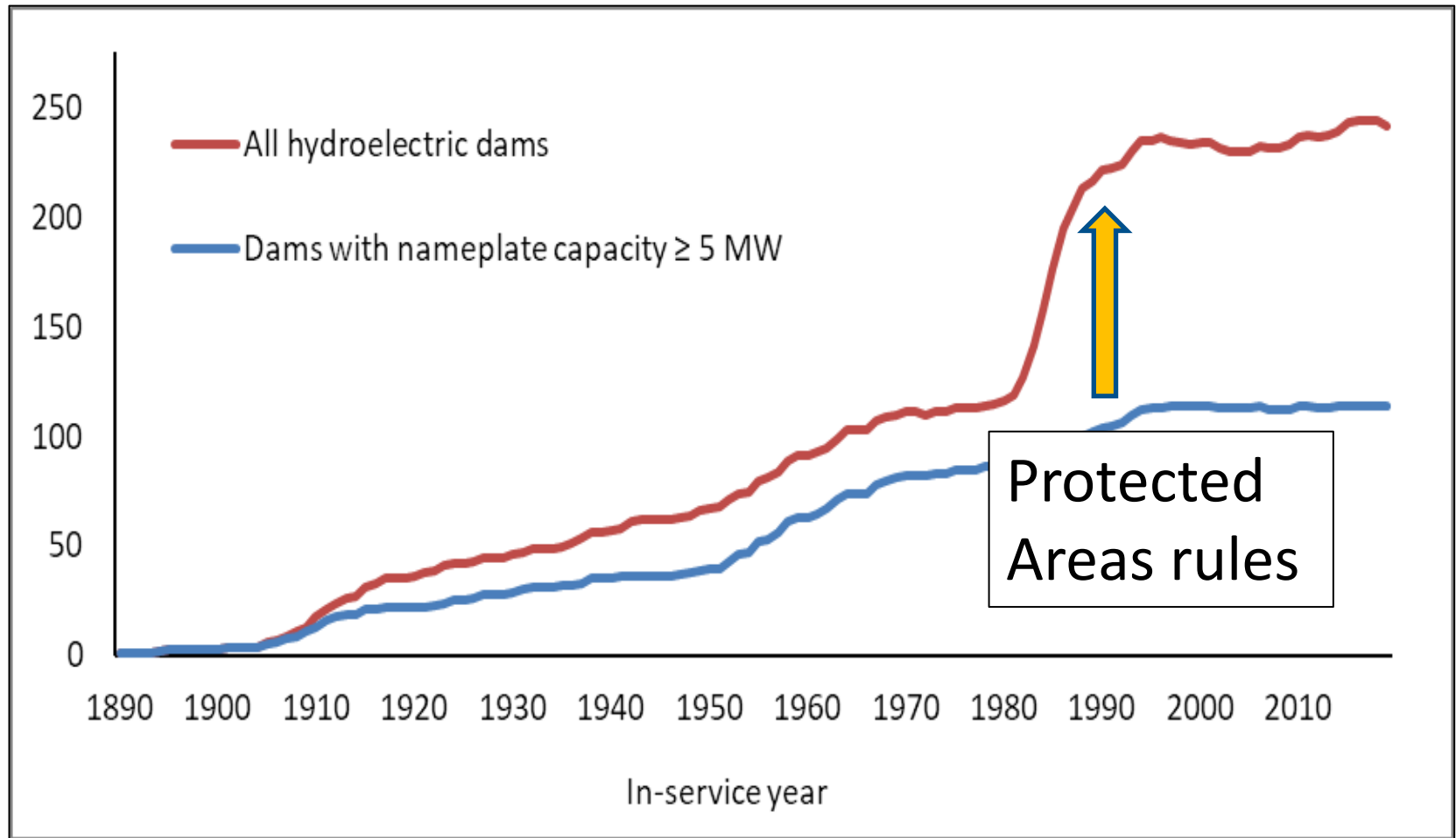
Natural production and artificial propagation

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

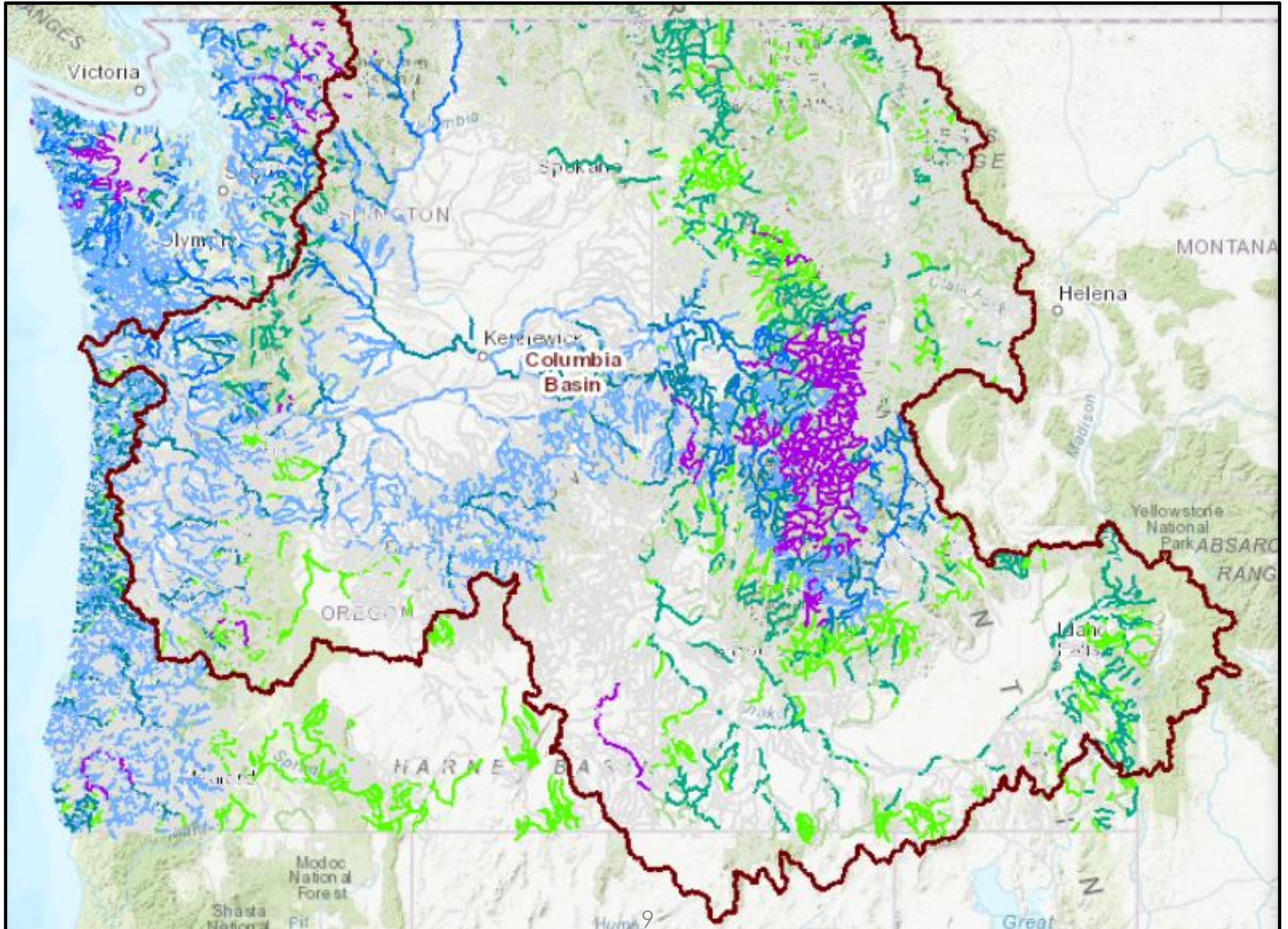
Program adaptive management

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

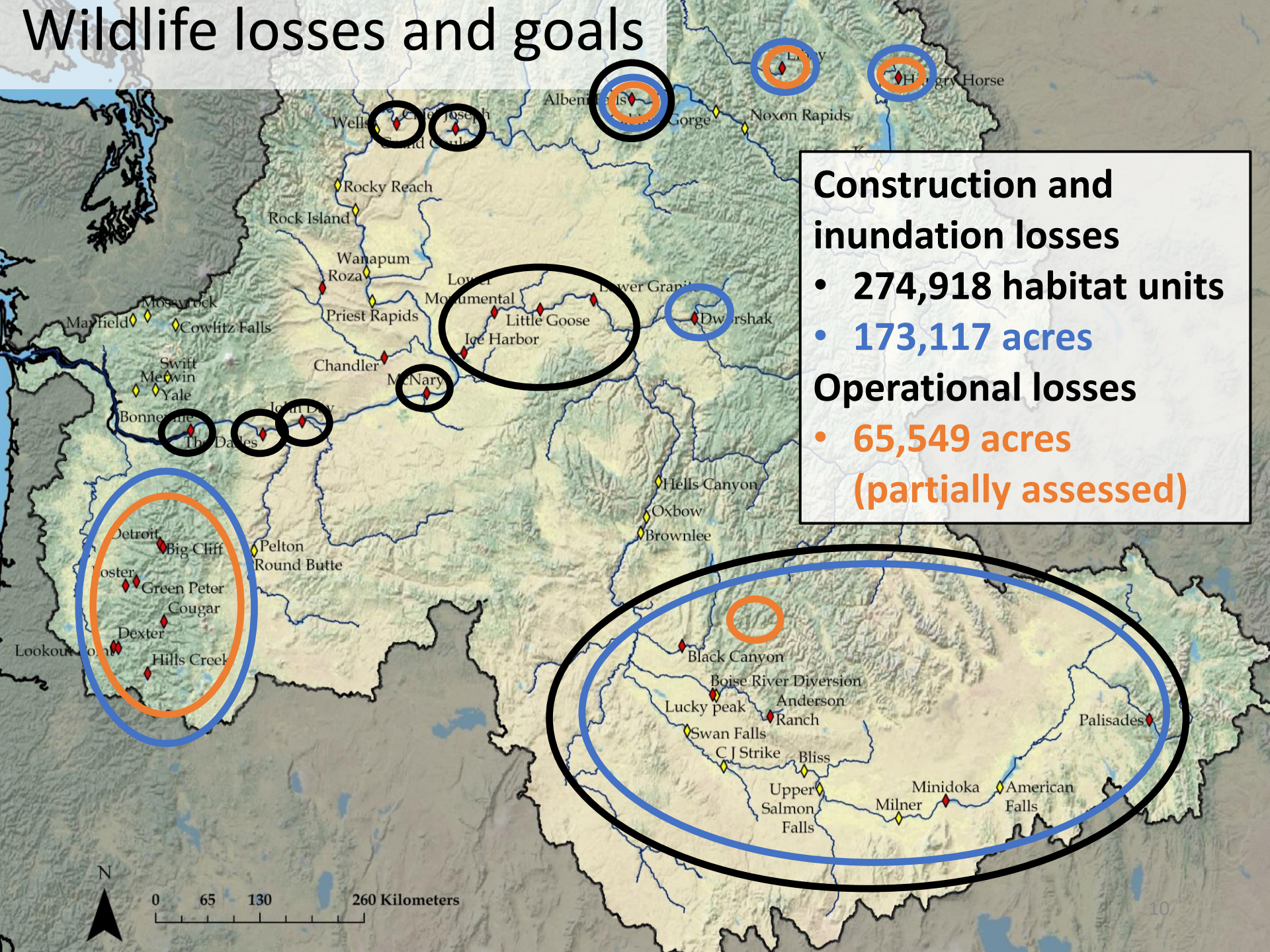
Development of hydrosystem

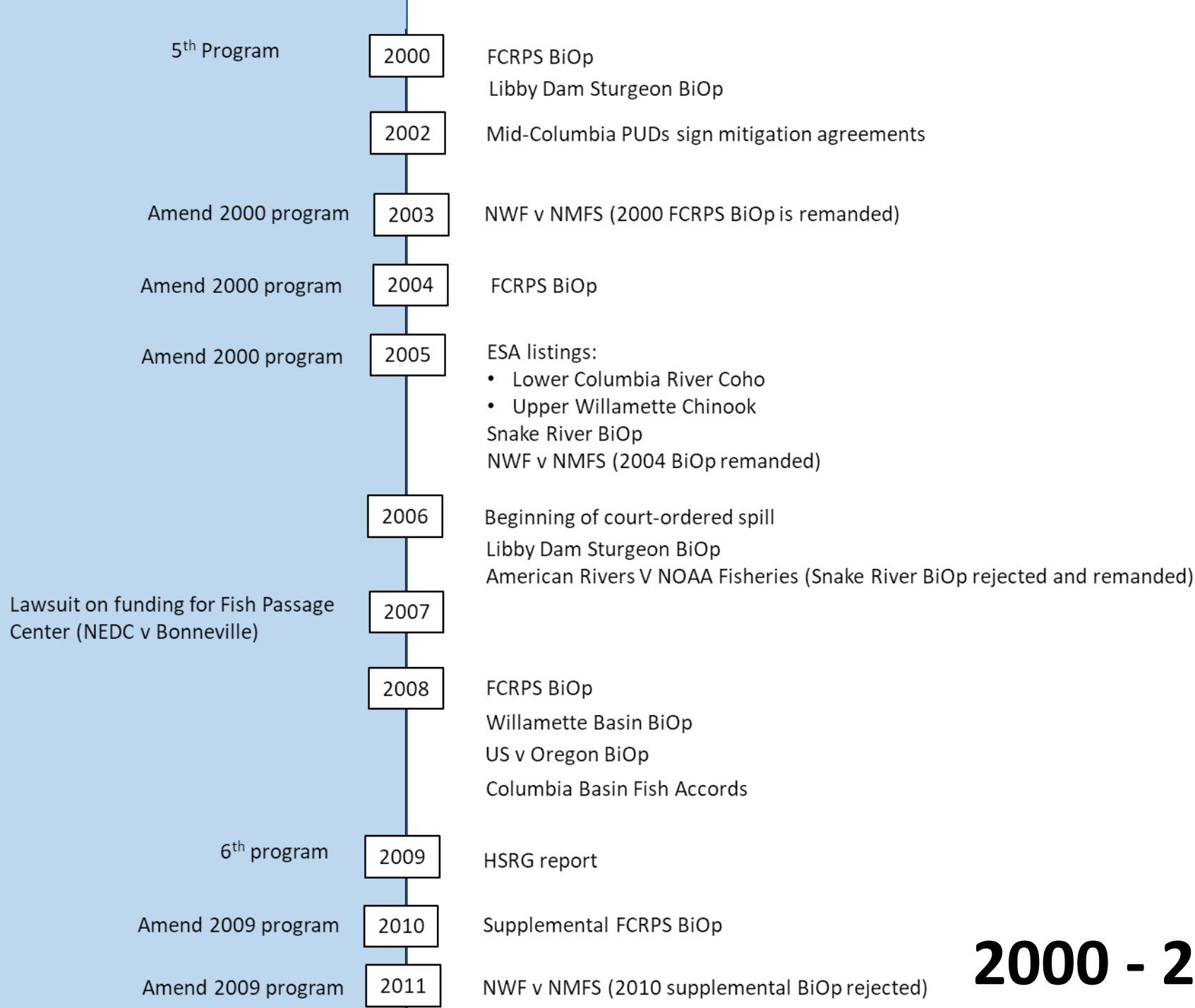


Protected Areas



Wildlife losses and goals





2000 - 2011

Program development- 2000s

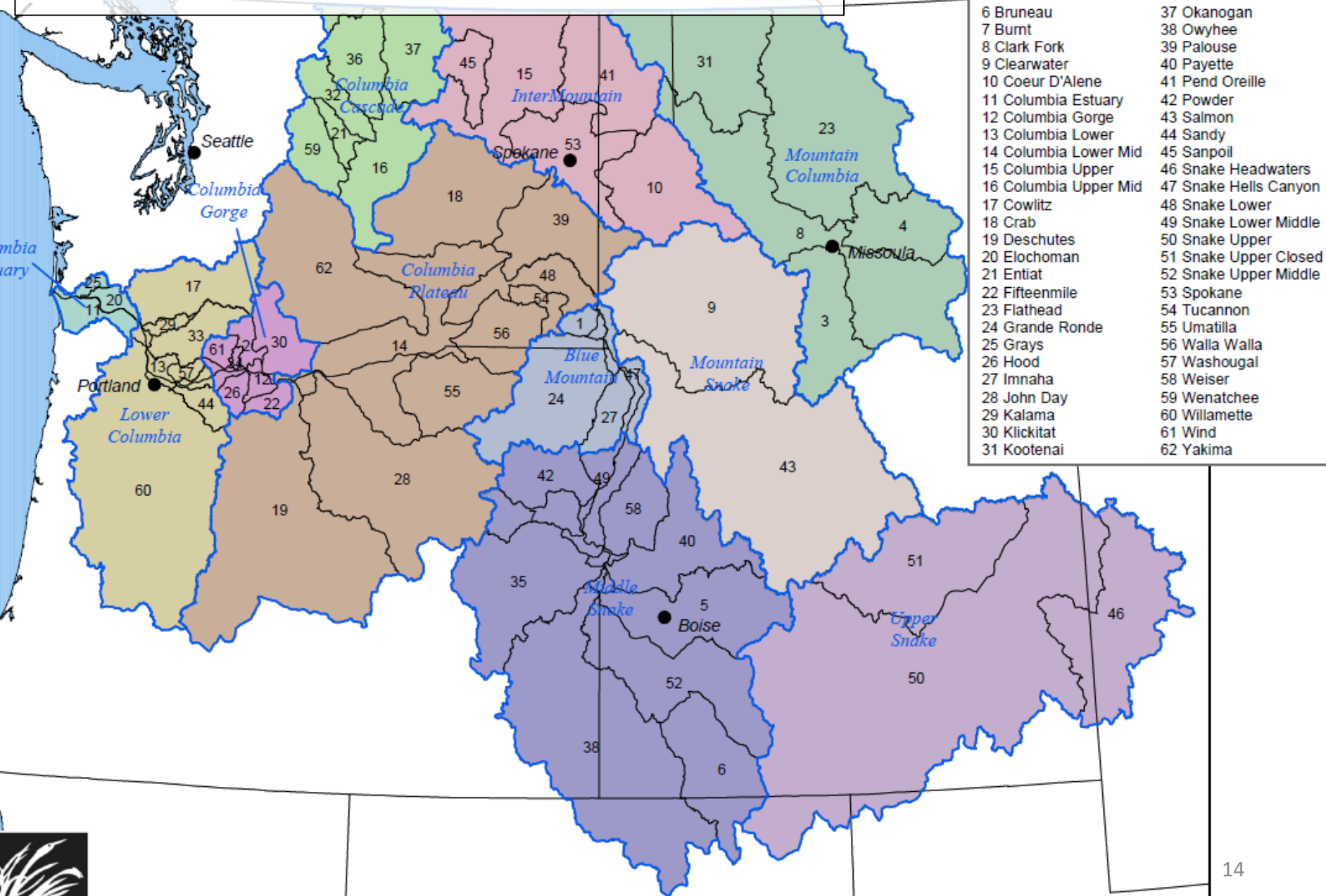
Year	Description
2000	5th Program
<i>2003</i>	<i>Mainstem amendments</i>
<i>2004</i>	<i>Adopt plans for 23 subbasins</i>
<i>2005</i>	<i>Adopt plans for 34 subbasins</i>
2009	6 th Program
<i>2010</i>	<i>Adopt 1 subbasin plan</i>
<i>2011</i>	<i>Adopt 1 subbasin plan</i>

Water Transactions Program



Source: Clark Fork Coalition, Montana

Adopted plans for 59 subbasins



2012 - 2022

7th program

2012

NMFS authorizes WA, OR, ID to remove up to 92 Sea Lions

2013

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	7 th Program
2020 part 1	<i>Goals, objectives, and strategy performance indicators</i>
2020 part 2	<i>Near-term priorities</i>

Goals, objectives, strategy performance indicators

Fish and Wildlife Program Program Performance and Adaptive Management



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

Zebra/Quagga Mussels - Ratio of Positive Detections to Number of Inspected Watercraft

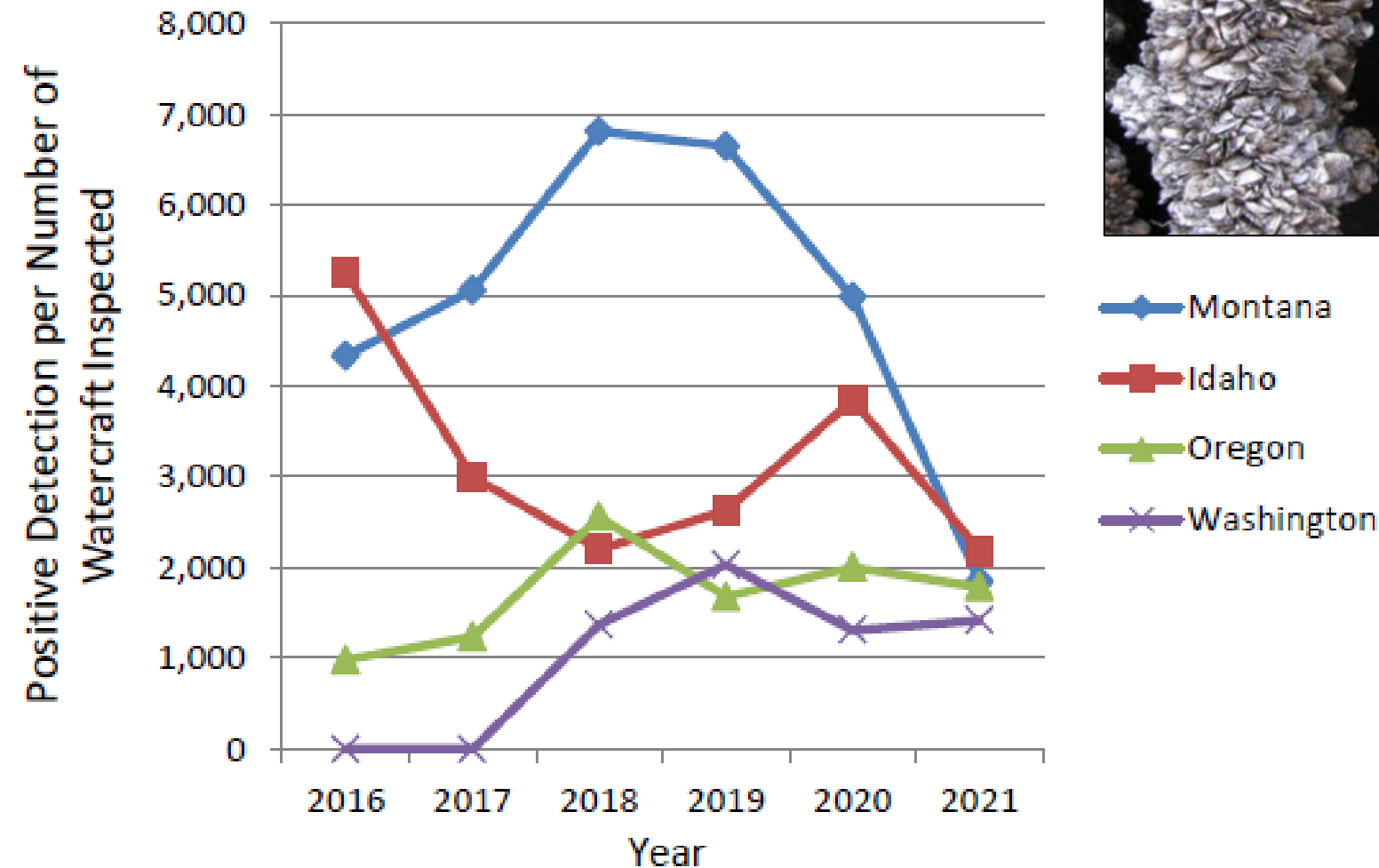
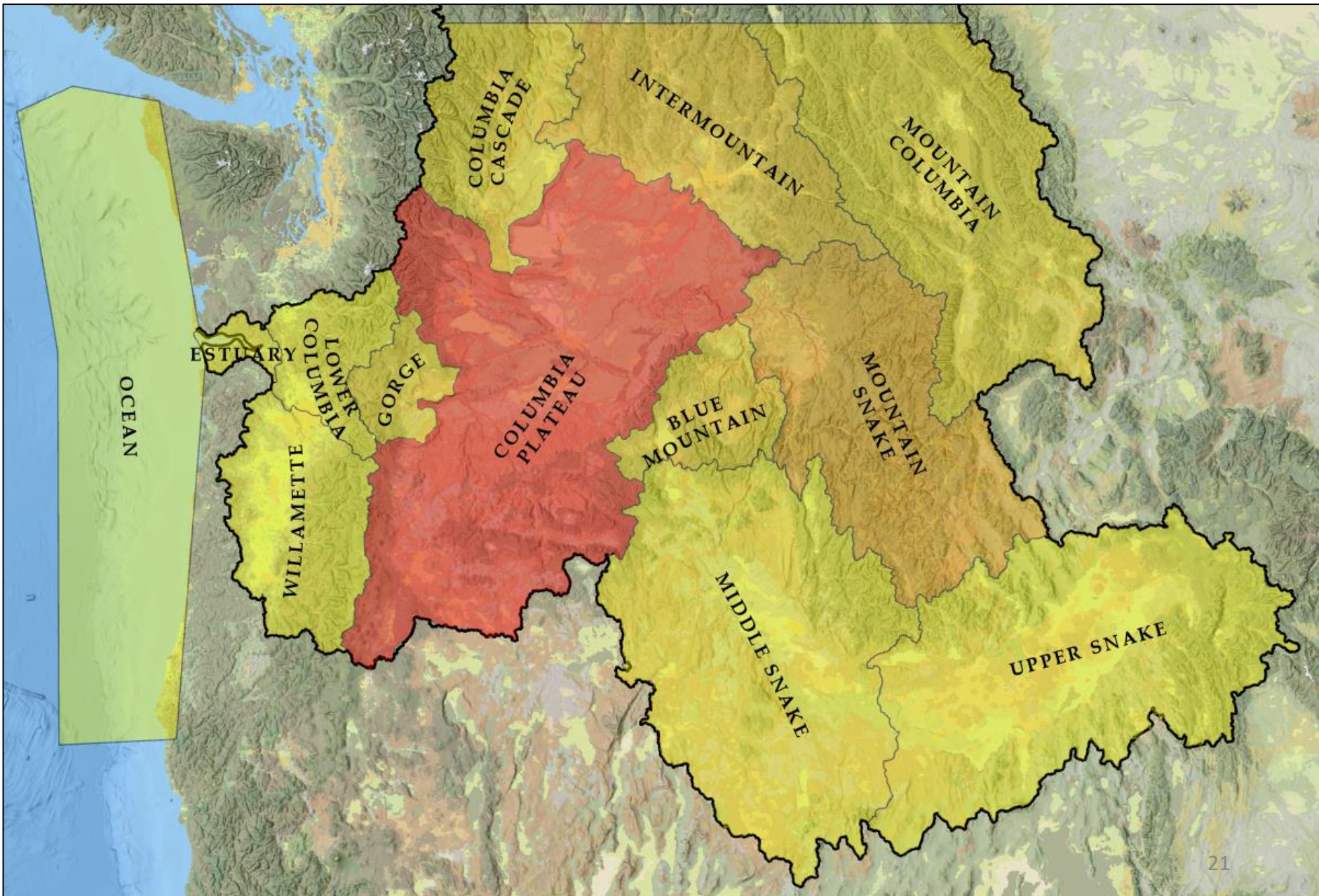


Photo: Washington Invasive Species Council



Questions on program
development?

Preview- 40 years of implementation



Program funding

BPA Reimbursable Program

BPA Direct Program

*Congressionally
appropriated capital
investment repayment*

Reimbursable Operations and Maintenance Expenditures

Army Corps of Engineers

Fish and Wildlife Service

Bureau of Reclamation

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)

Lower Snake River
Compensation Plan
Hatcheries

Leavenworth Hatchery
Complex

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

BPA overhead costs

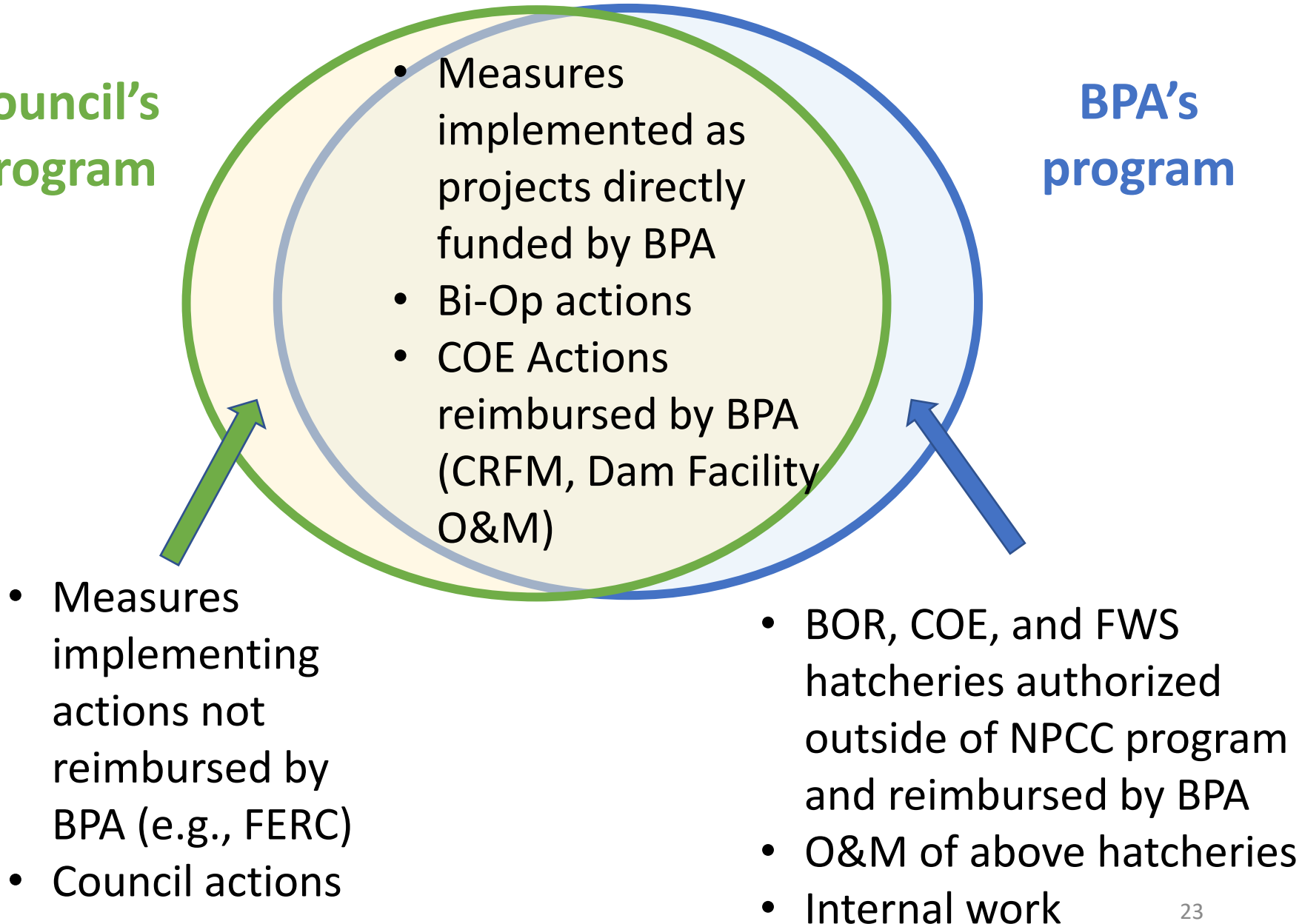
50% of NPCC budget

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

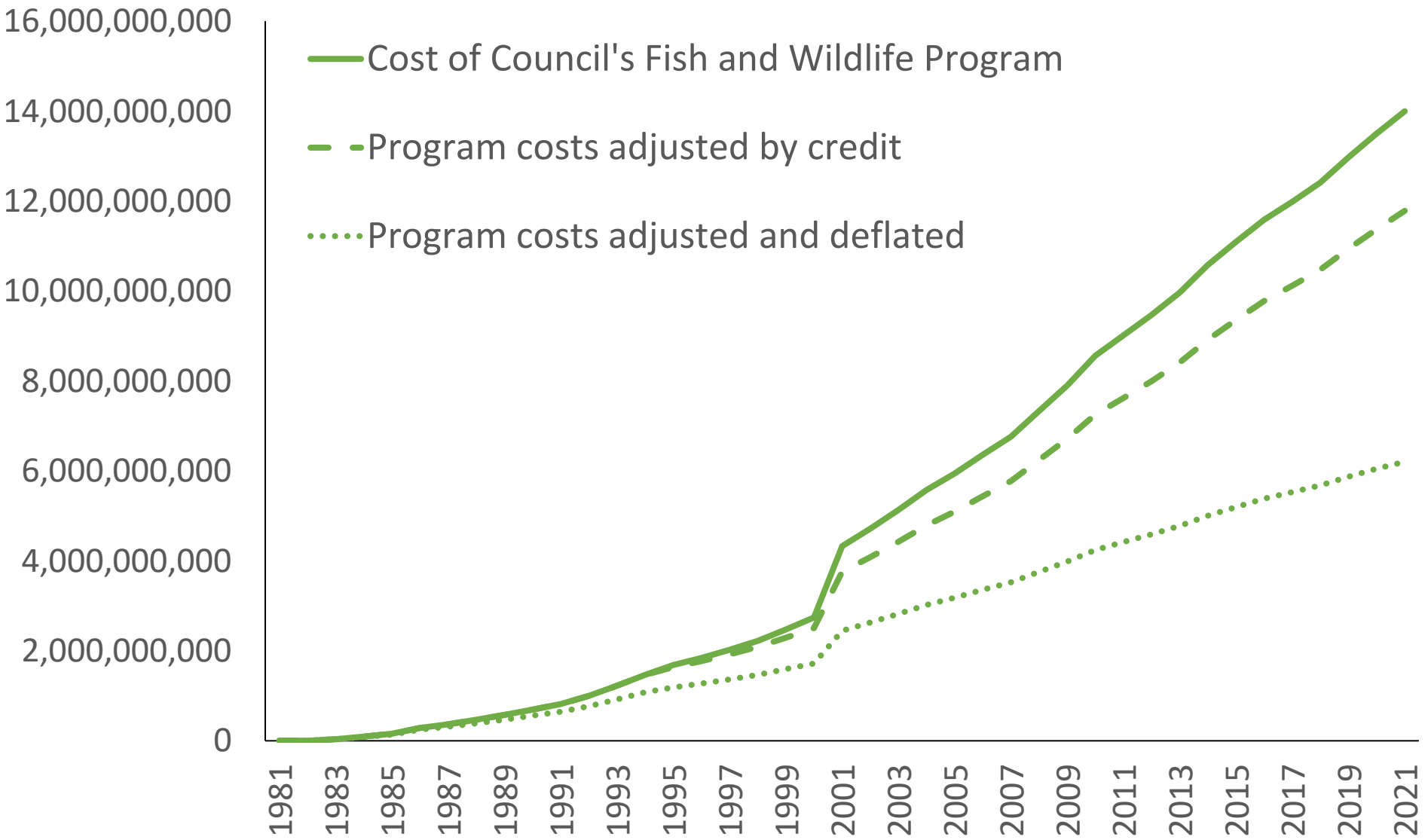
Council and BPA programs substantially overlap

Council's program

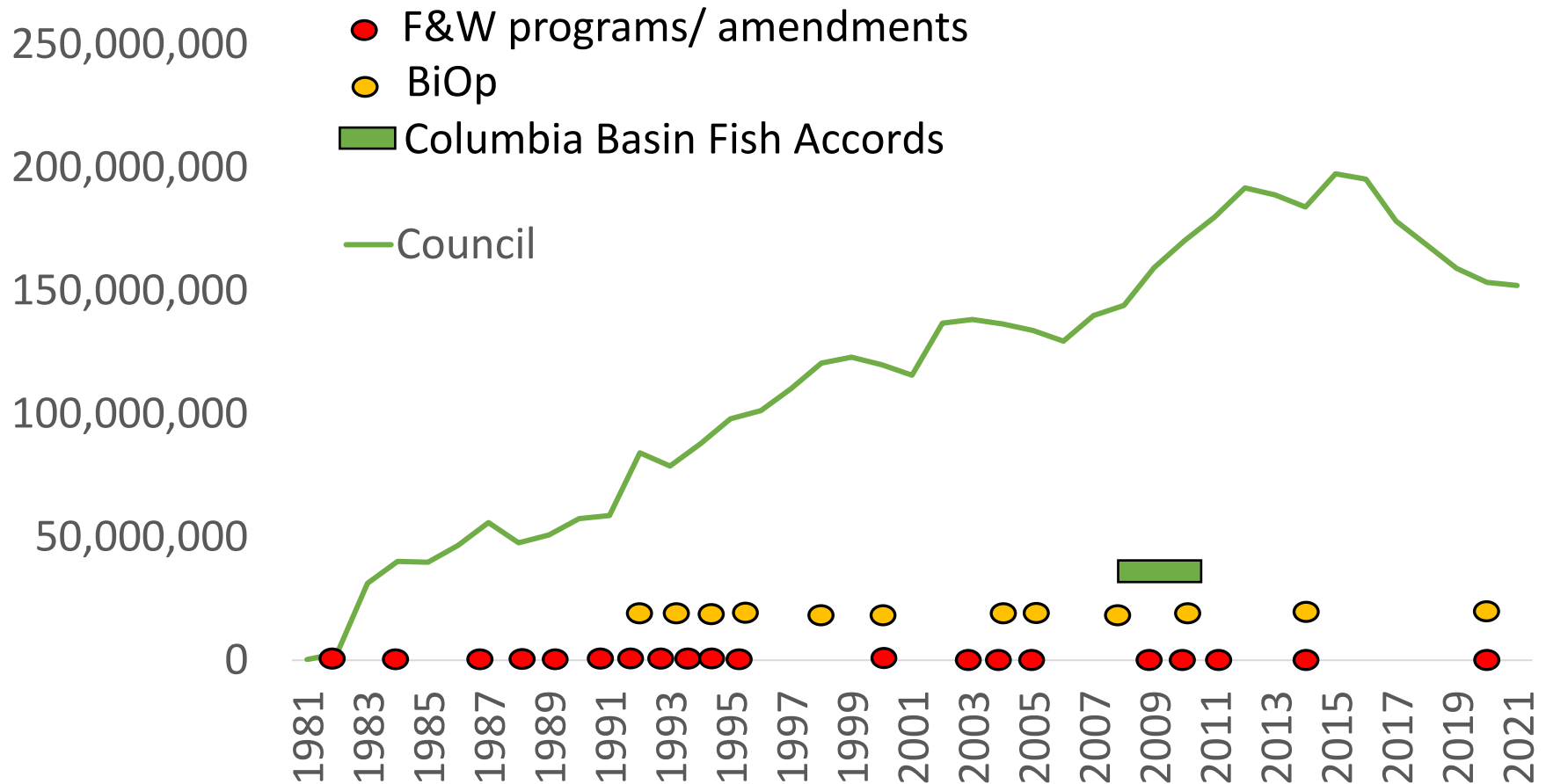
BPA's program



Cumulative investment



Annual variation in costs in relation to events



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



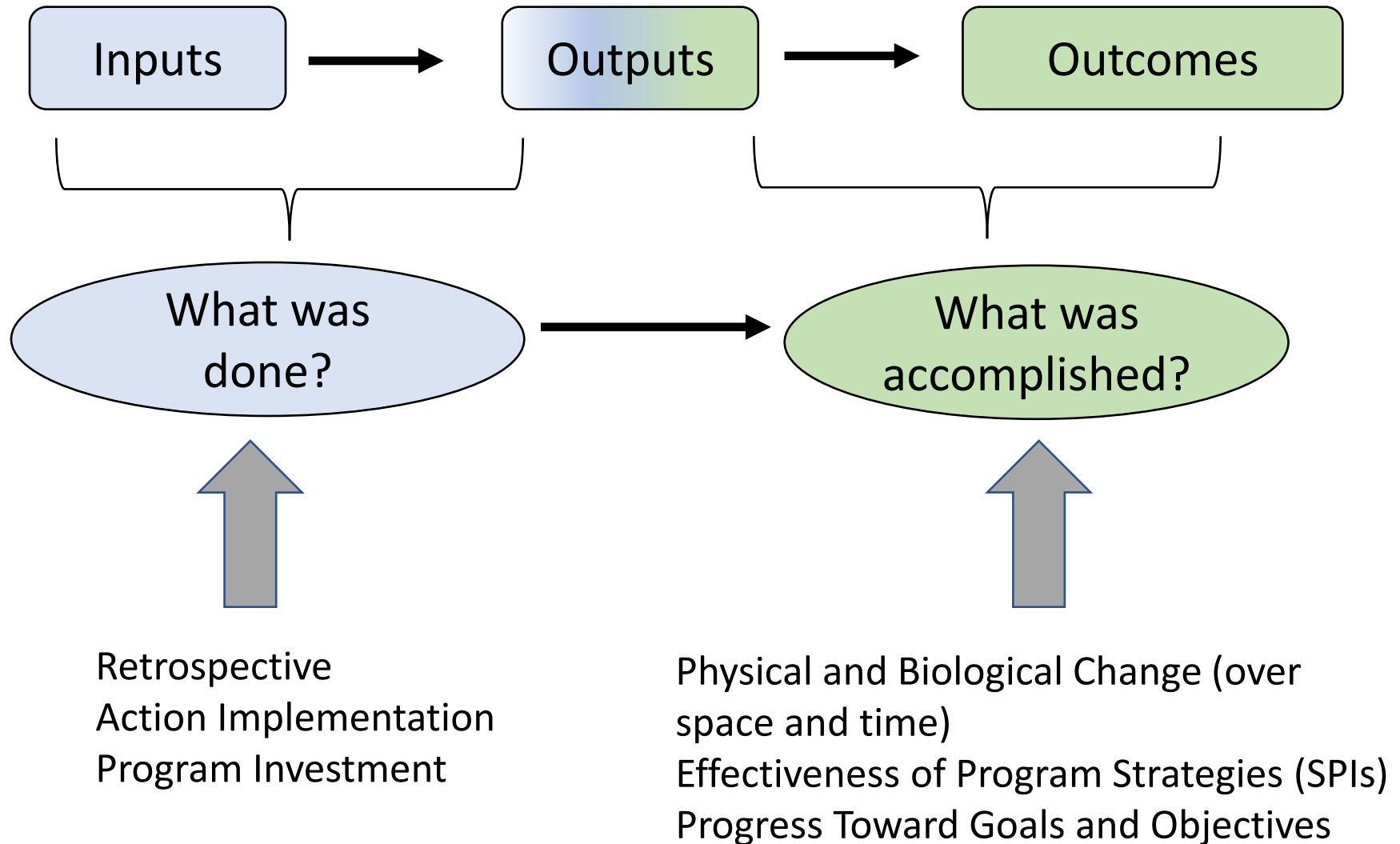
Questions on investments?

Approach for Performance Assessment

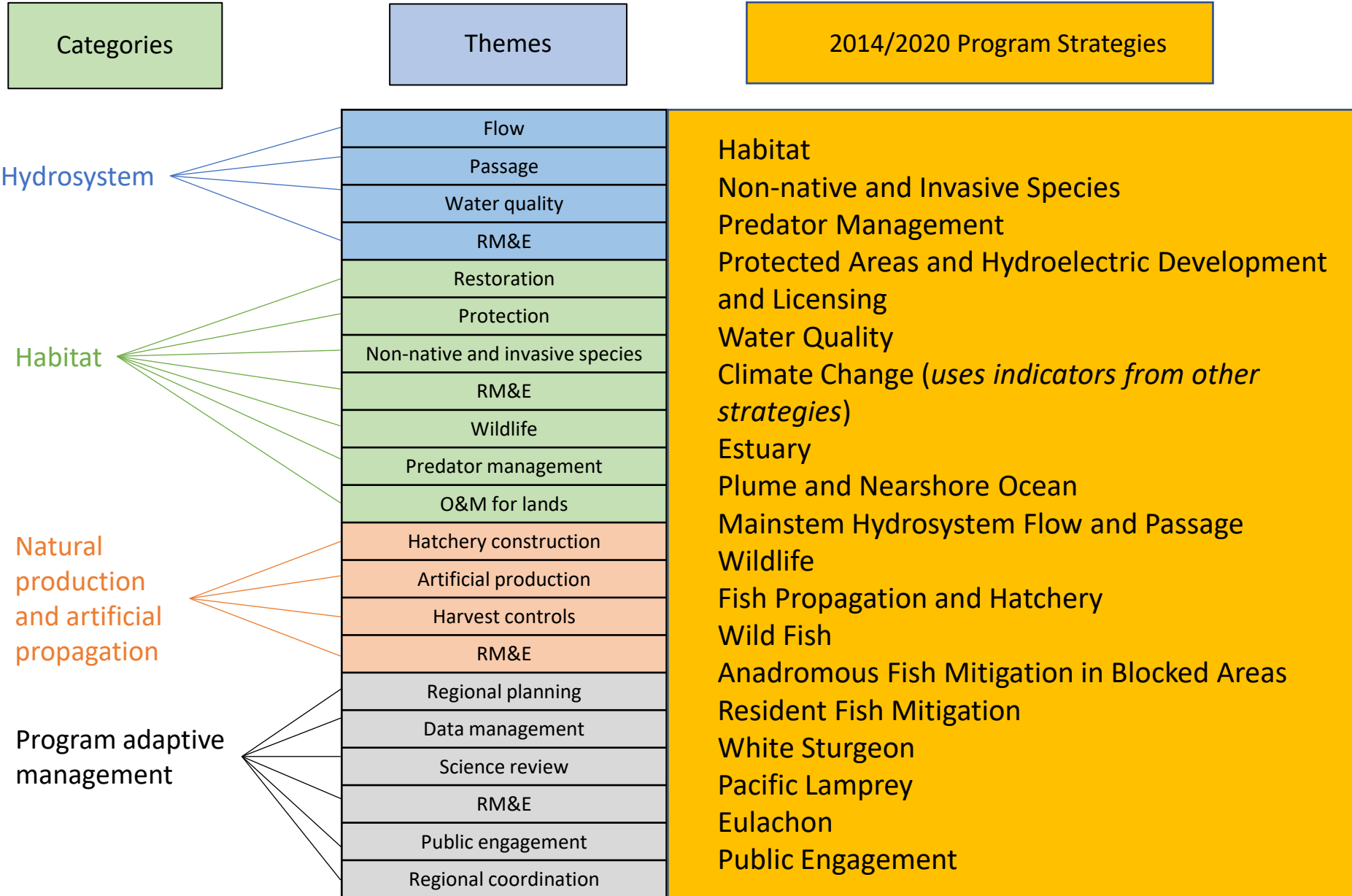
parts 2 - 5

- **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







Mapping SPIs to Categories and Themes - Hydrosystem Example

Categories

Themes

2014/2020 Program
Strategies

Hydrosystem

Flow

Passage

Water
quality

RM&E

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

Mapping SPIs to Categories and Themes - Hydrosystem Example

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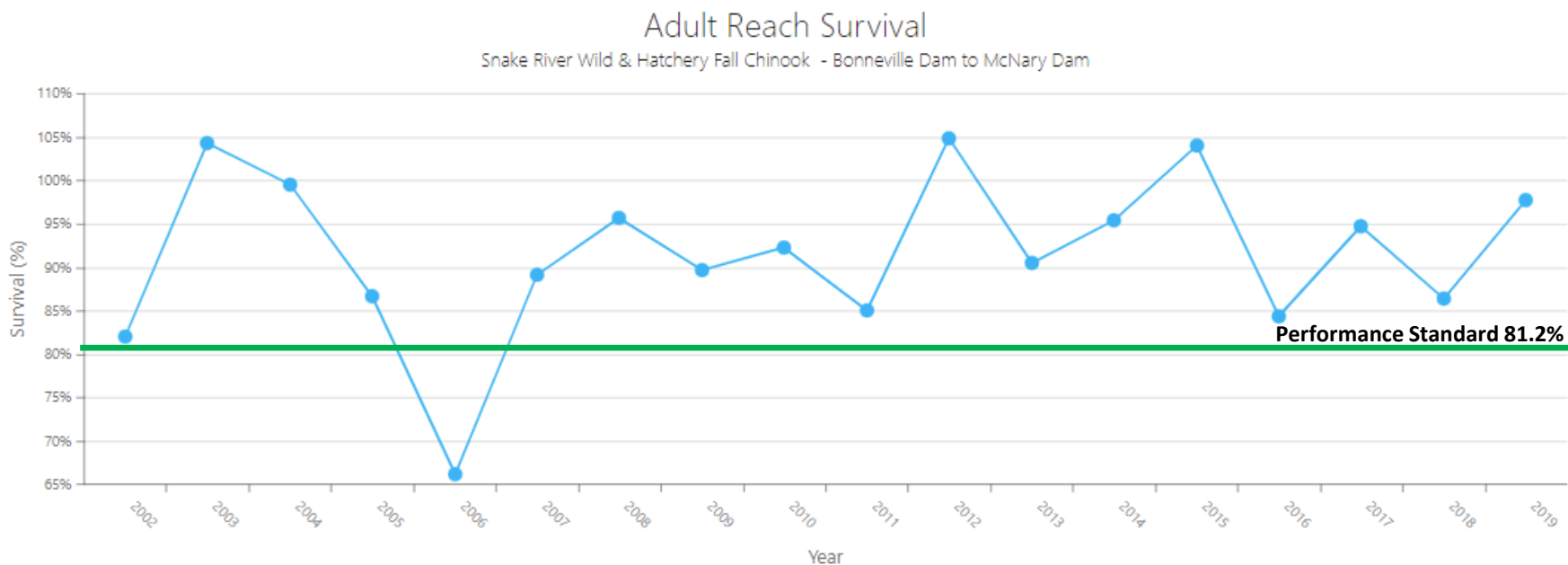
Water
quality

RM&E

- Mainstem hydrosystem flow and passage operations

- Water quality
- Resident fish mitigation
- White Sturgeon
- Lamprey
- Blocked areas

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



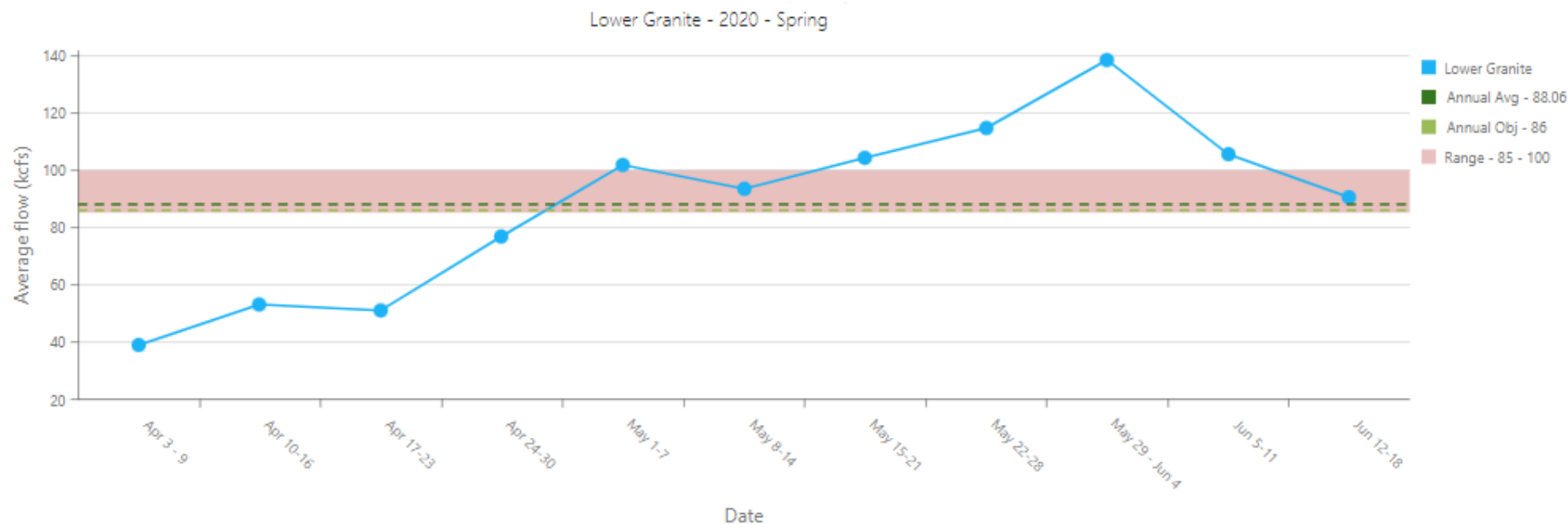
Notes:

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

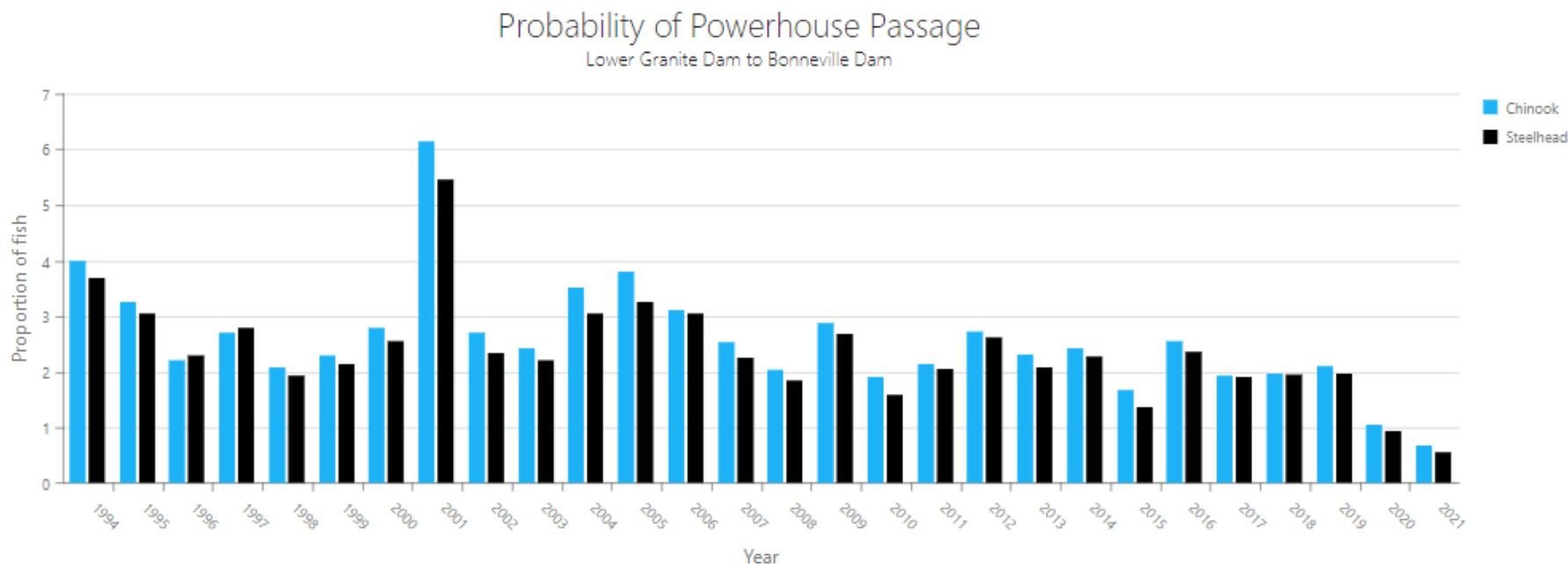
Seasonal flows at specified Columbia and Snake River dams with associated target flows from BiOp and Water Management Plan. E3-1 (Show Data)



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

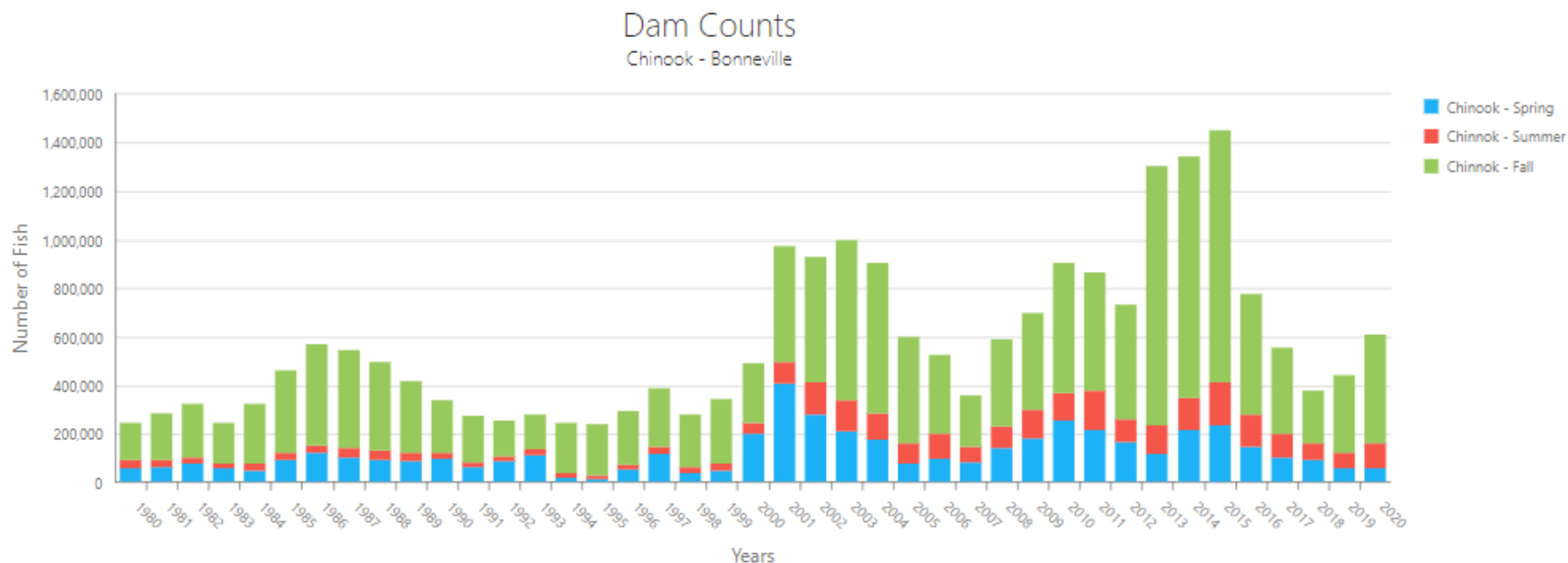
Powerhouse encounter rates from Lower Granite Dam to Bonneville Dam. S3-1 (Show Data)



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)



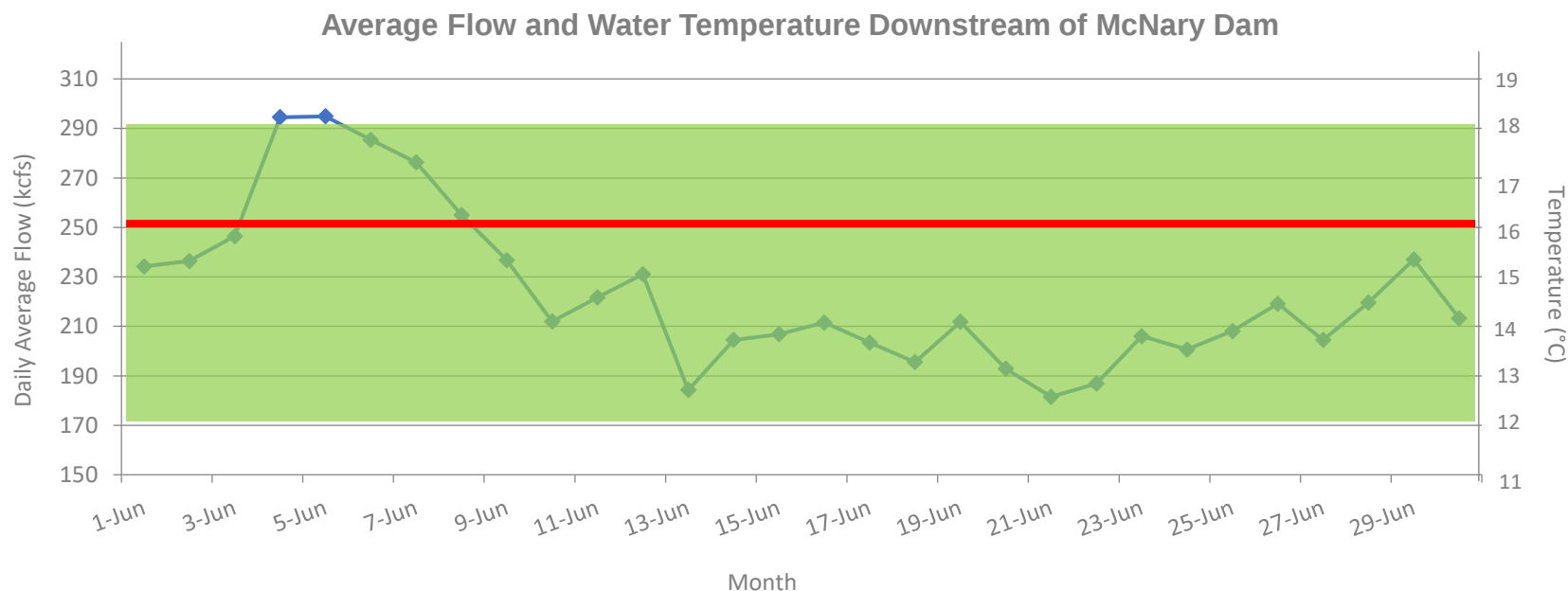
Notes:

1. Chinook counts include adults and jacks

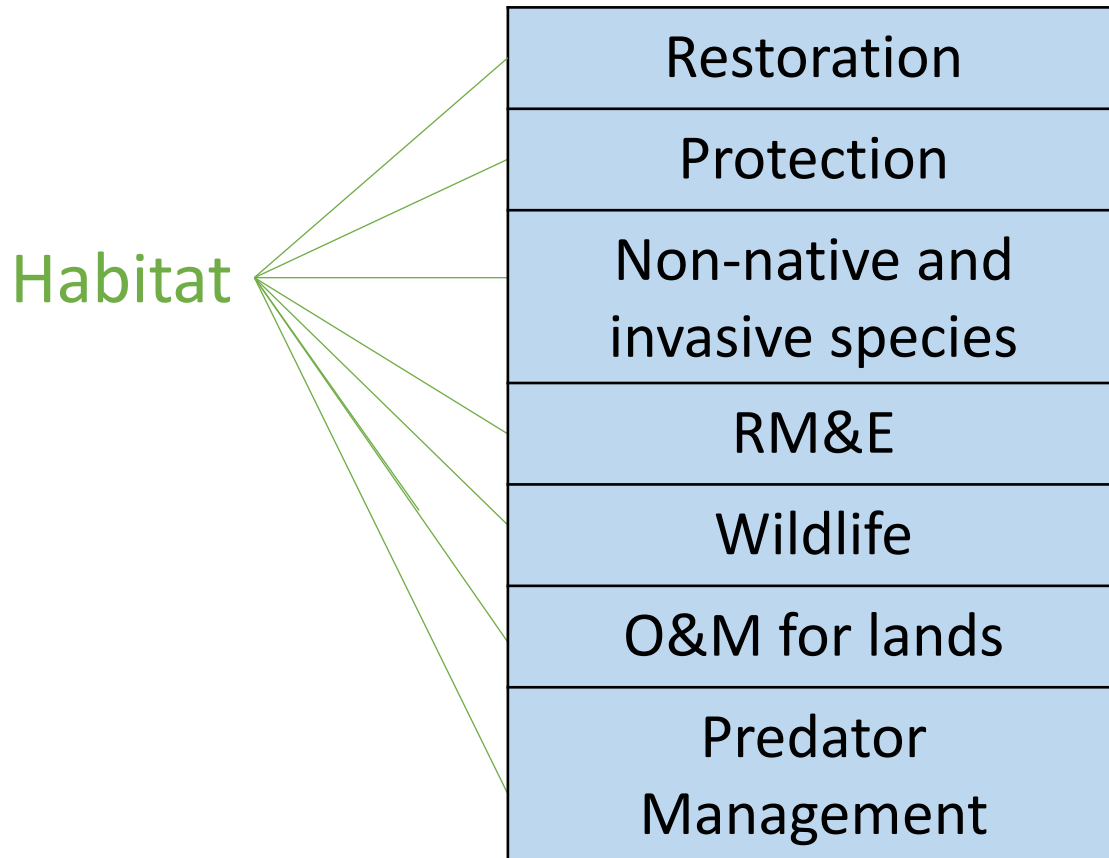
[Context, Metadata, and Sources](#)

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?