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July 7, 2021

MEMORANDUM

TO: Fish and Wildlife Committee Members

FROM: Leslie Bach and Kris Homel

SUBJECT: Assessing Program Performance: Approach and Status Update

BACKGROUND:

Presenters: Leslie Bach and Kris Homel

Summary: Council staff will present preliminary concepts and initial efforts to develop an approach for assessing the performance of the Council's Fish and Wildlife Program and will solicit feedback and input from Committee members.

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: Evaluating the performance of the fish and wildlife program requires a working definition of "performance" and an analytical framework. This is particularly challenging for a 40-year program implemented at the scale of the Columbia Basin and will require substantial collaboration with basin fish and wildlife managers.

In general, we define performance to mean results or progress relative to expectations or benchmarks. To evaluate performance, we adopted language used by many organizations to divide the work of the program into a series of steps, specifically, **inputs** (what was called for; investments), **outputs** (type and volume of work completed), **outcomes** (short term changes produced by outputs), and **impacts** (long-term changes from outcomes). Because impacts describe changes occurring over long time frames, broad geographic scales, and against a backdrop of other efforts and ongoing human effects, it can be difficult to draw a causal line between specific impacts and the Council's fish and wildlife program. As such, our initial focus is on understanding the work that was done (**inputs and outputs**) and describing the accomplishments from that work (**outcomes**). Using this organizational framework, we can evaluate performance at the individual strategy scale and the overall program scale, recognizing that work done at the project scale is already evaluated by project sponsors and through ISRP review.

We envision describing the inputs and outputs through creating a geographic overview at the basin scale, as well as more detailed information at the province scale. In the basin-scale overview, our summary will include: (1) how the program has developed over time, (2) implementation of different strategies, and (3) investments in the fish and wildlife program relative to total investments in the basin by all major funding sources, along with additional topics. We will also describe the social, political, and environmental context surrounding program development and implementation. At the province scale, summary topics include: (1) geographic distribution of implementation and investment, by strategy, (2) relationship between implementation and identified priorities in each province, and (3) other geographic summaries.

Efforts to understand outcomes occur at both the program and strategy scales. Program-scale outcomes will be informed by the geographic overview (above) and will be the subject of future discussions. Strategy-scale outcomes are currently being described through the 2020 addendum Strategy Performance Indicators (SPIs). These indicators were developed in collaboration with the fish and wildlife managers through a series of eight workshops during the 2020 addendum process. Following the adoption of the addendum, we assembled a Strategy Performance Indicators Workgroup to help compile, evaluate and report on the SPIs. Initial efforts have focused on identifying the sources of data and compiling an initial set of indicators for review by the workgroup. Subsequently this information will be uploaded into our redeveloped Program Tracker website.

Program Performance: Approach and Status Update

Leslie Bach and Kris Homel

Photo credit: Erik Merrill

Outline

- Background
 - Program framework
 - A focus on performance
- Approach to evaluation
- Status of evaluation

Fish and Wildlife Program: background

- **40 year mitigation effort for effects of hydrosystem**
- **Implemented throughout Columbia River Basin**

Photo credit: NPCC

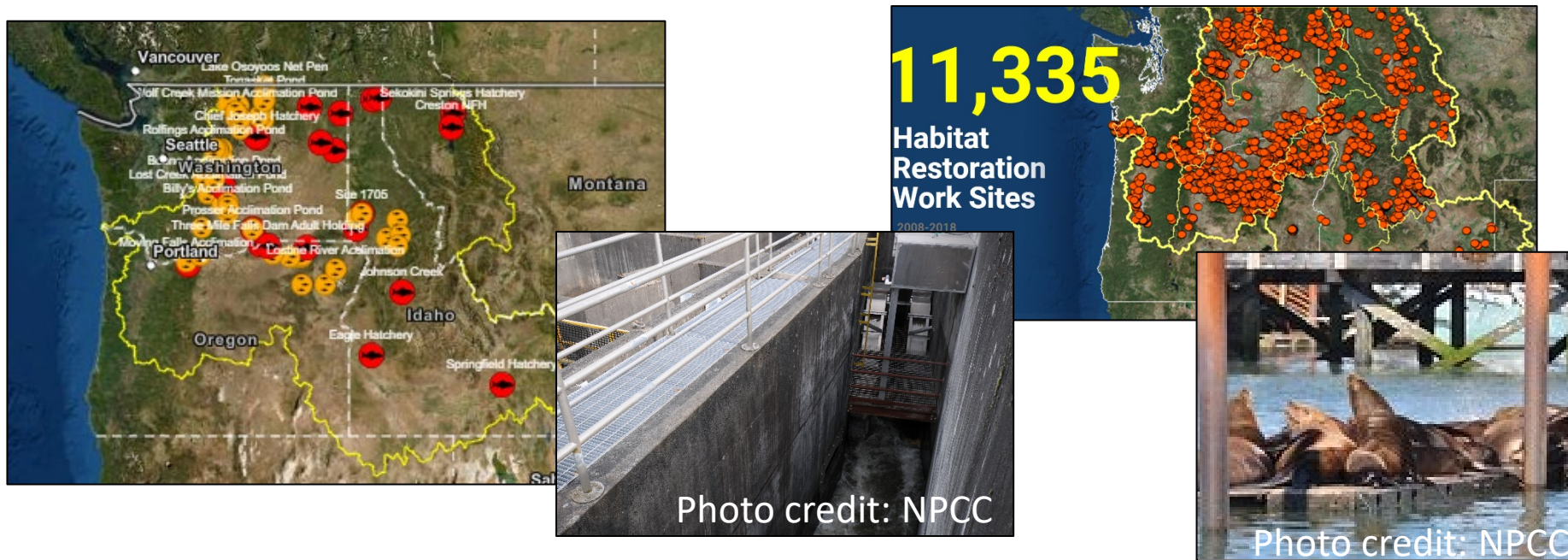
Fish and Wildlife Program: background

Described in 15 comprehensive or minor program amendments and addendums

Strategies have expanded over time

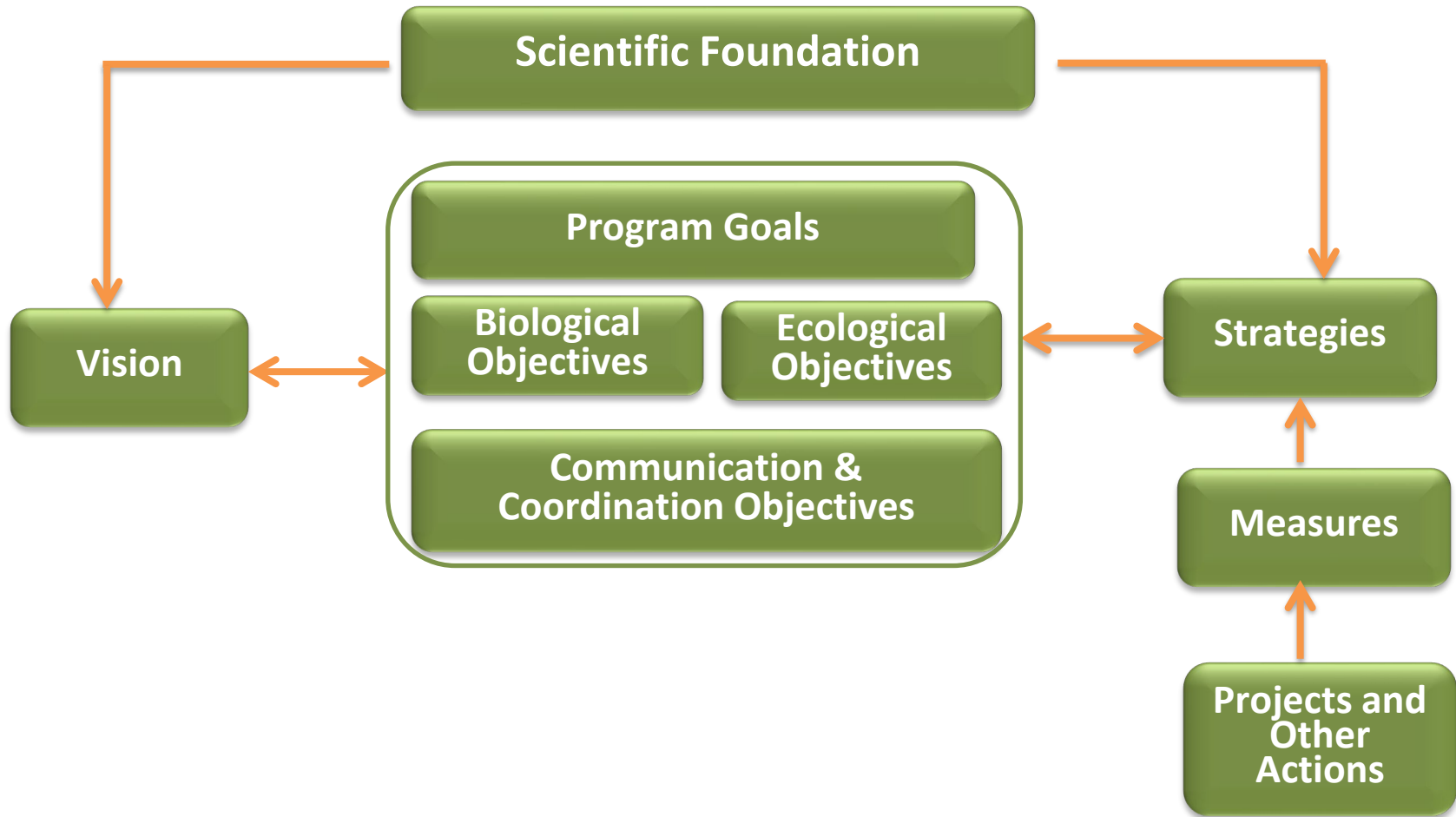


Fish and Wildlife Program: background



- Hundreds of projects and actions implemented at different times; some long term, others limited in duration
- Part of tapestry of mitigation, restoration, and recovery efforts in basin

Fish and Wildlife Program: Framework



Program Goals and Objectives

- Anadromous Salmon and steelhead: returns, SARs, survival standards
- Sturgeon: abundance, distribution, diversity, productivity
- Lamprey: abundance, passage
- Resident salmonids: self-sustaining populations, habitat (miles and acres)
- Wildlife: acres and HUs
- Ecological objectives: flow, habitat, water quality
- Communication, coordination objectives

Strategies in 2014/2020 Program

Strategies include:

- 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

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”



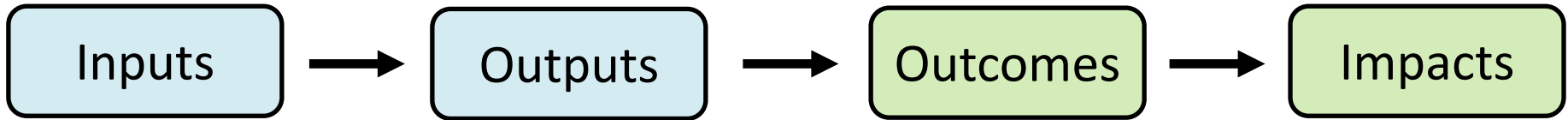
Defining performance

- Generally, performance = results (or progress) relative to expectations (or benchmarks)
- Examples of benchmarks:
 - Strategy performance indicators
 - Objectives and goals
 - Program priorities
- Examples of questions:
 - Progress towards benchmarks
 - Outcomes in different regions or over time
 - Other performance questions exist, as well

Conceptual approach to evaluating performance

- Terminology
- Scales and relationships among scales
- Methods
- Specific topic areas

Terminology for evaluating performance



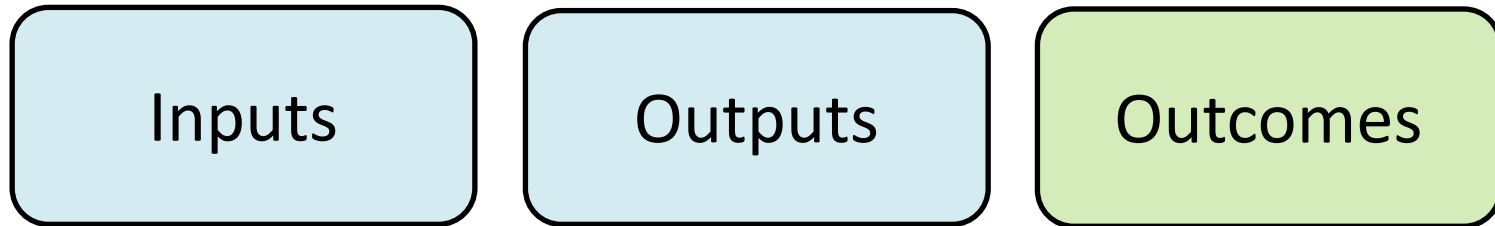
- The set of measures (projects and other actions) in program
- Also describes investment

- The quantity of what was done
- Immediate timeframe

- Shorter term changes resulting from outputs
- Can be thought of as achieving objectives

- Long term changes resulting from outcomes
- Can be thought of as achieving goals or vision

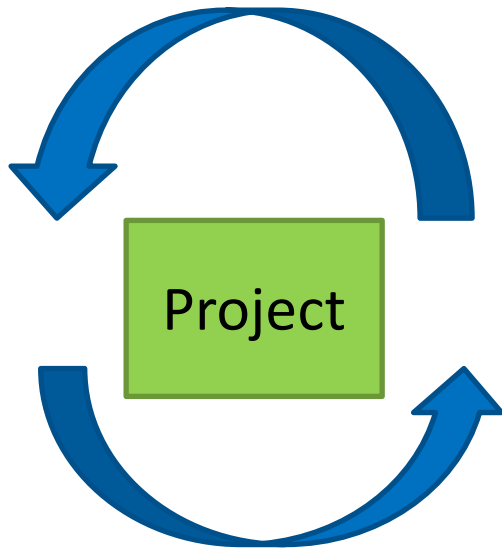
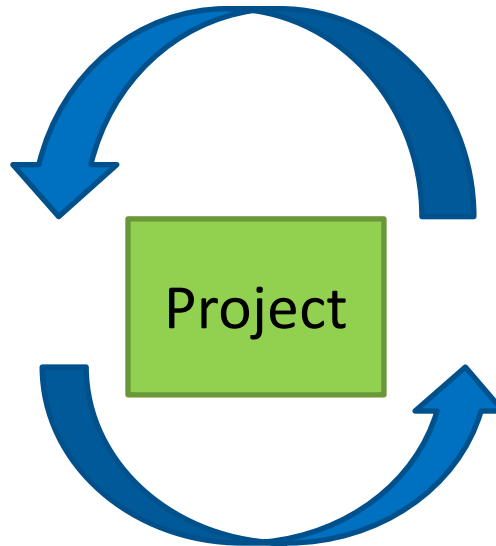
Scales of evaluation



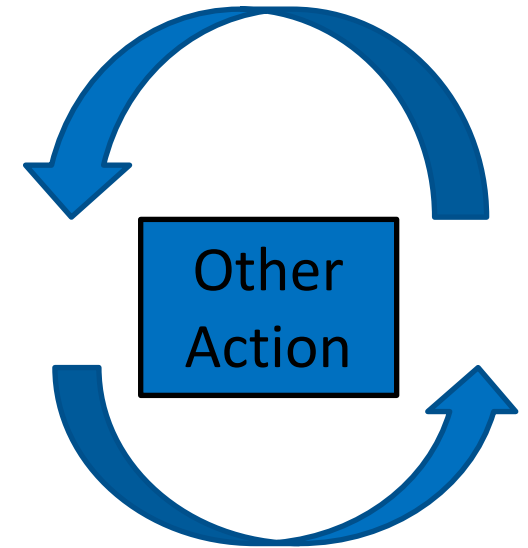
- **Program organization:** projects/ other actions, strategies, program
- **Timeframe:** immediate, short-term, long-term
- **Geographic:** local sites, provinces, basin

Project scale

Design, funding,
Implementation



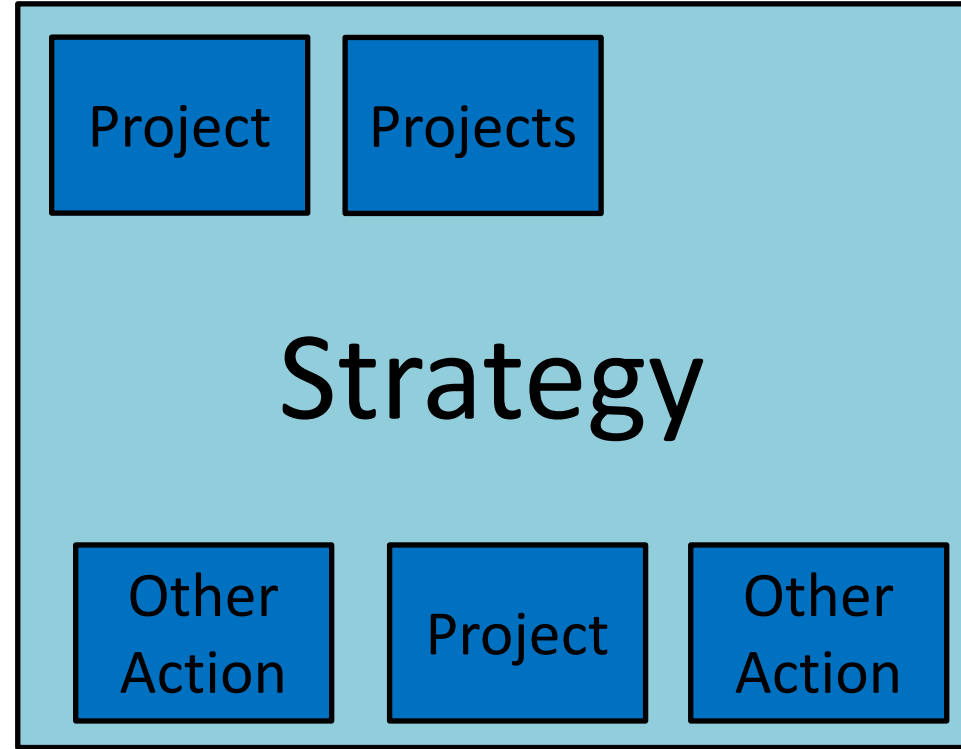
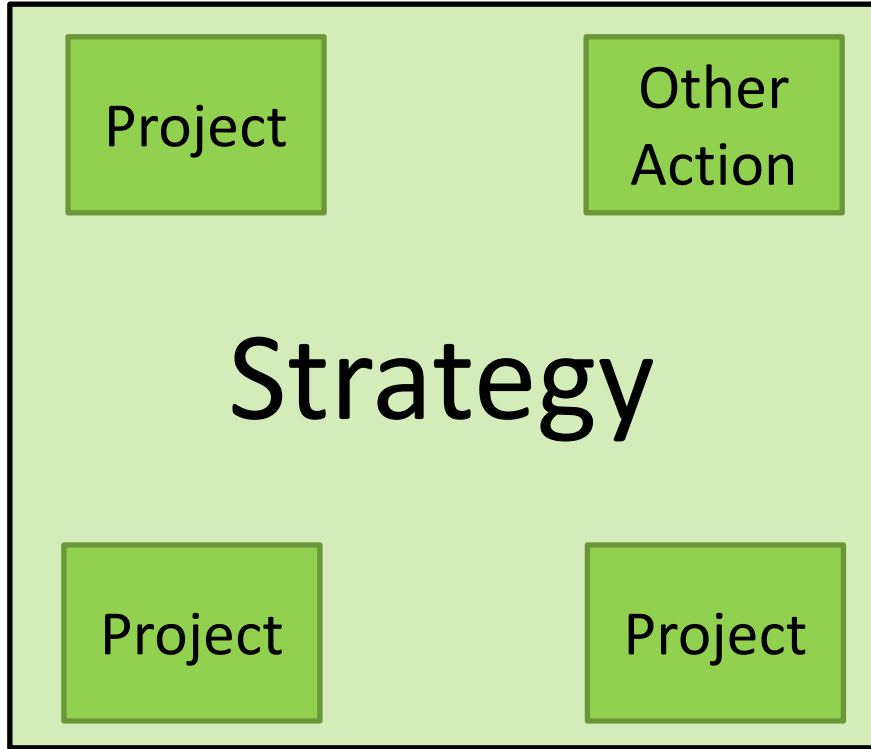
Review, adaptive
management



Other actions exist outside of projects

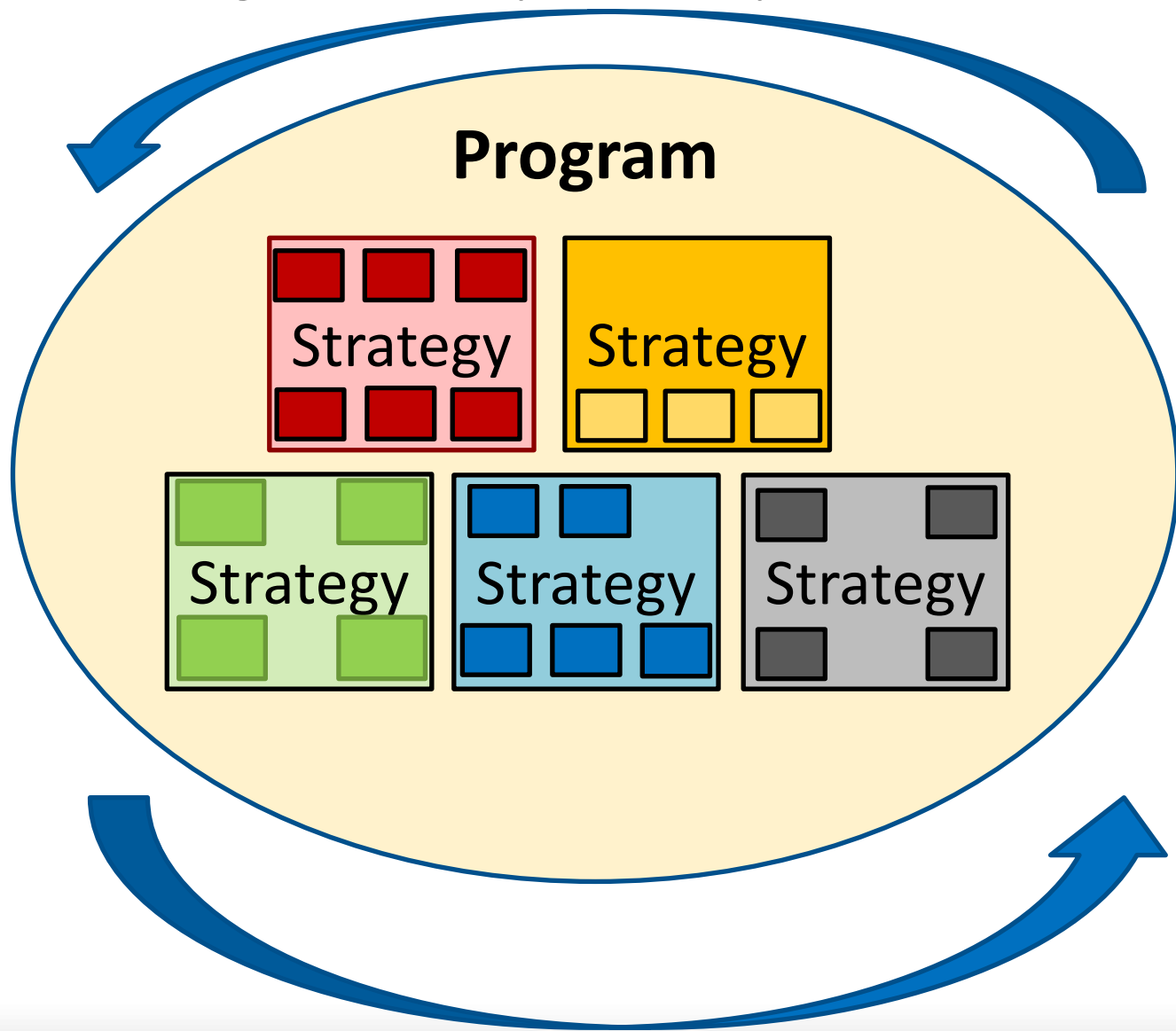
Strategy scale

Conceptual design, Implementation



Program scale

Program development, Implementation



Program performance

Outcomes evaluation

- Evaluate ecological changes that have occurred as a result of, or in parallel with, implementation of program
 - Qualitative and quantitative methods (in development)
 - Other types of outcomes can also be evaluated
- Example evaluation at each scale:
 - Program : Progress towards objectives and goals
 - Strategy : Effectiveness of strategies (SPI)
 - Project : Implemented and reviewed by managers; reviewed by ISRP; *implementation and evaluation mechanisms already in place*

Outcomes evaluation

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Specific topic areas

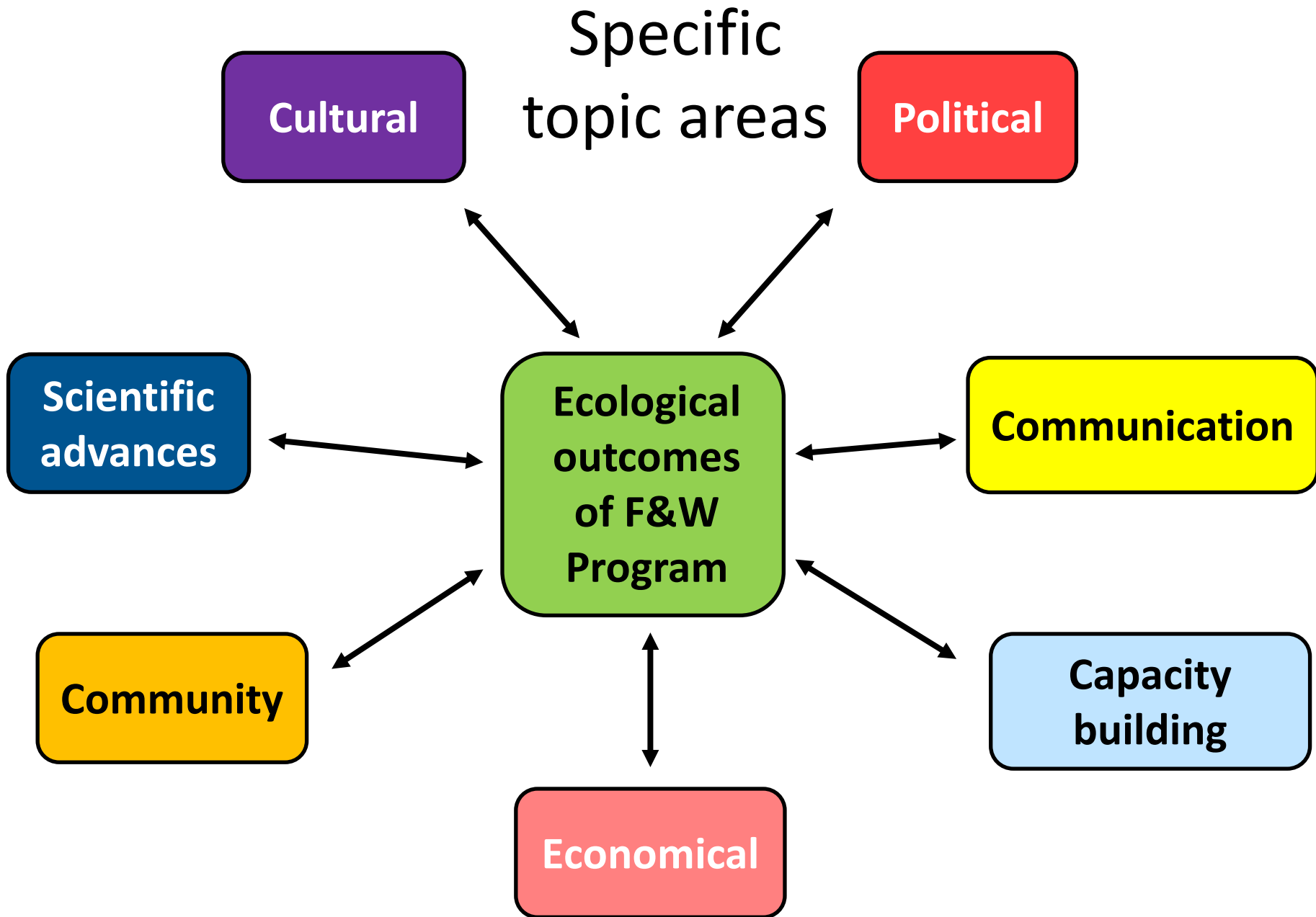
- Primary focus of F&W program is producing ecological changes in the basin
- Appears in Vision, Goals, and Objectives
- Describing or quantifying these changes is a major part of program performance

**Ecological
outcomes
of F&W
Program**

Specific topic areas

**Ecological
outcomes
of F&W
Program**

- Through producing ecological outcomes, other types of outcomes also achieved
- These can further enhance ecological outcomes



Specific topic areas

Cultural

Political

Scientific advances

Communication

Ecological outcomes of F&W Program

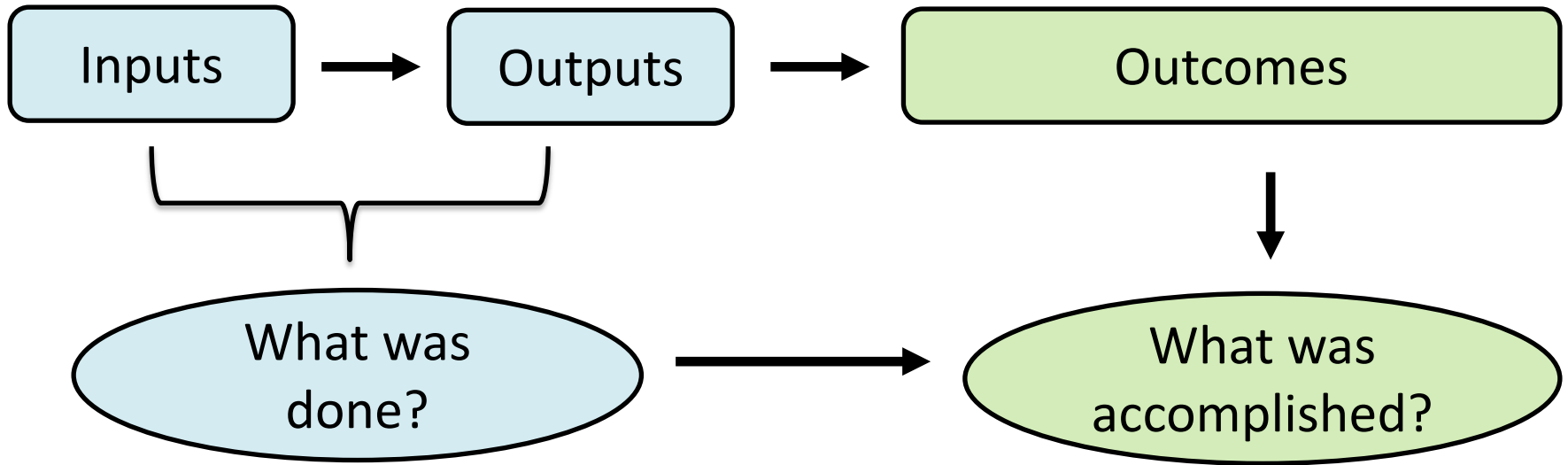
Community

Capacity building

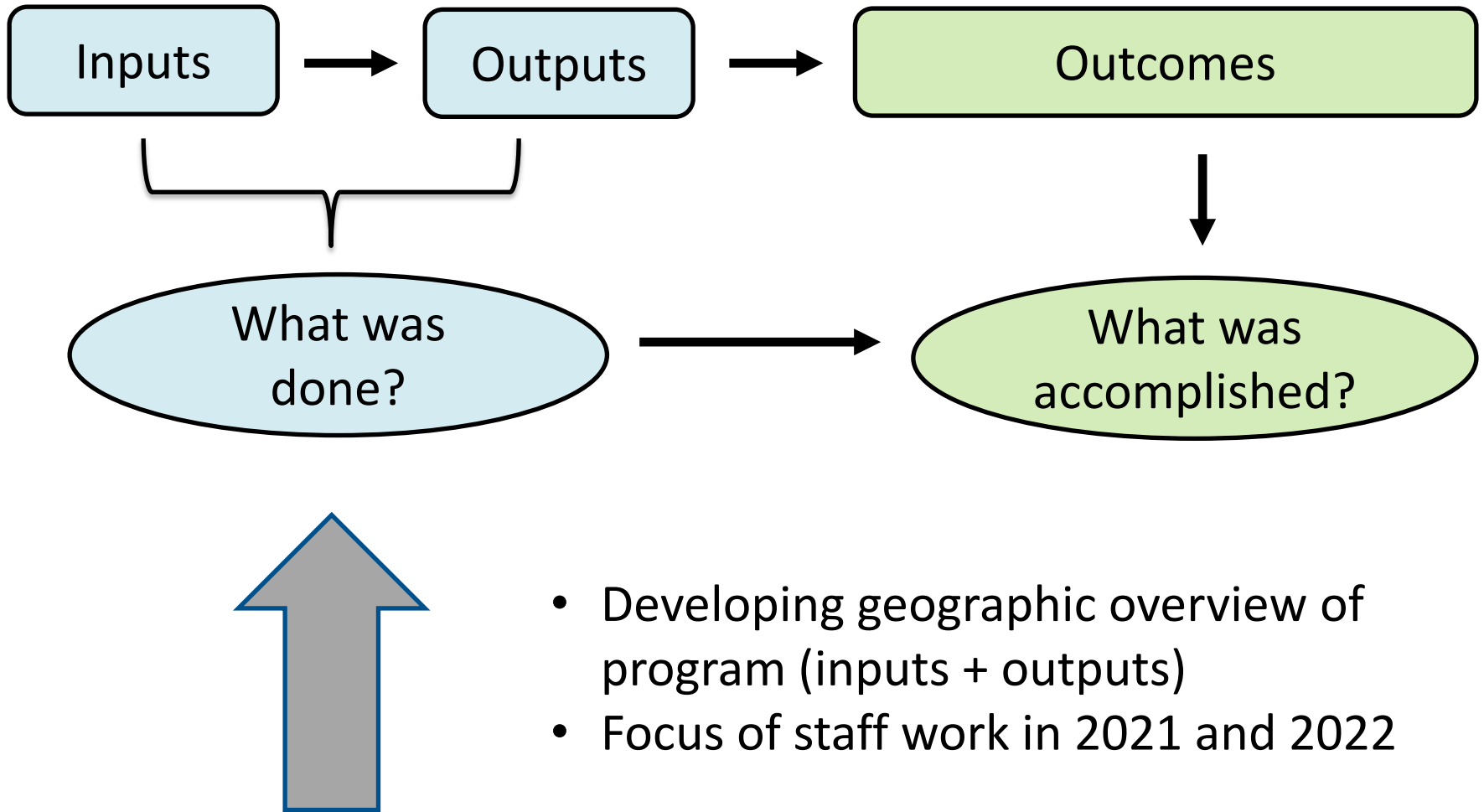
Economical

Approach discussion

Status of performance evaluation



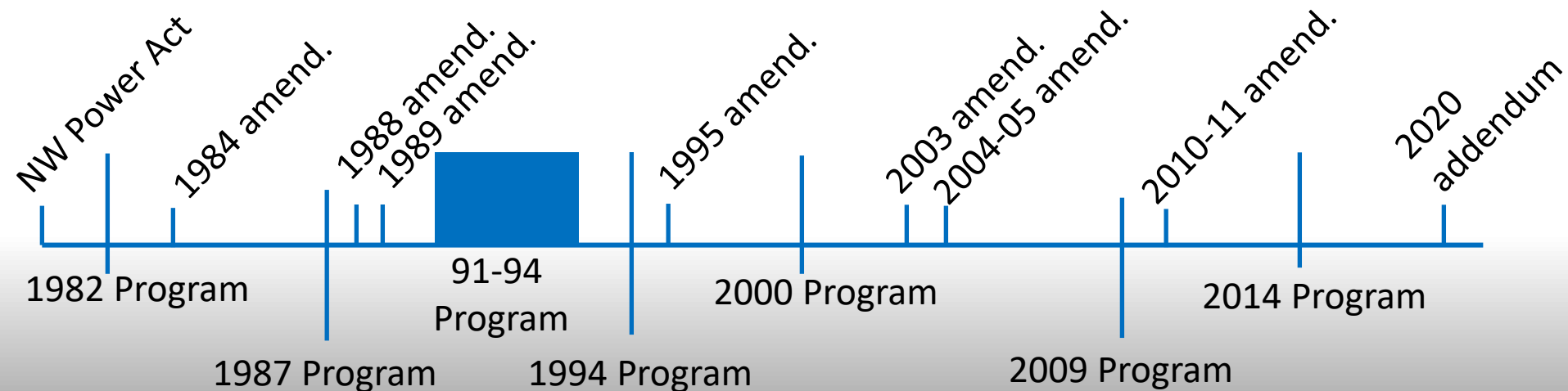
Status of performance evaluation



- Developing geographic overview of program (inputs + outputs)
- Focus of staff work in 2021 and 2022

Geographic overview

- Summary of program changes over time (high level)
 - 15 major and minor amendments
- Documentation of program investments, implementation and progress at the basin and province scale
- Developing: summary, GIS maps, and other visuals



Overview topics- basin scale

- Program change over time (historical perspective)
- Investments: total in program relative to other mitigation, restoration, and recovery efforts in the Basin
- Implementation of projects and other actions, grouped by strategy
- Examples:
 - Hydrosystem actions (to improve conditions) in basin over time
 - Type and extent of habitat restoration
 - Contribution of hatchery releases to harvest
 - Other associated work

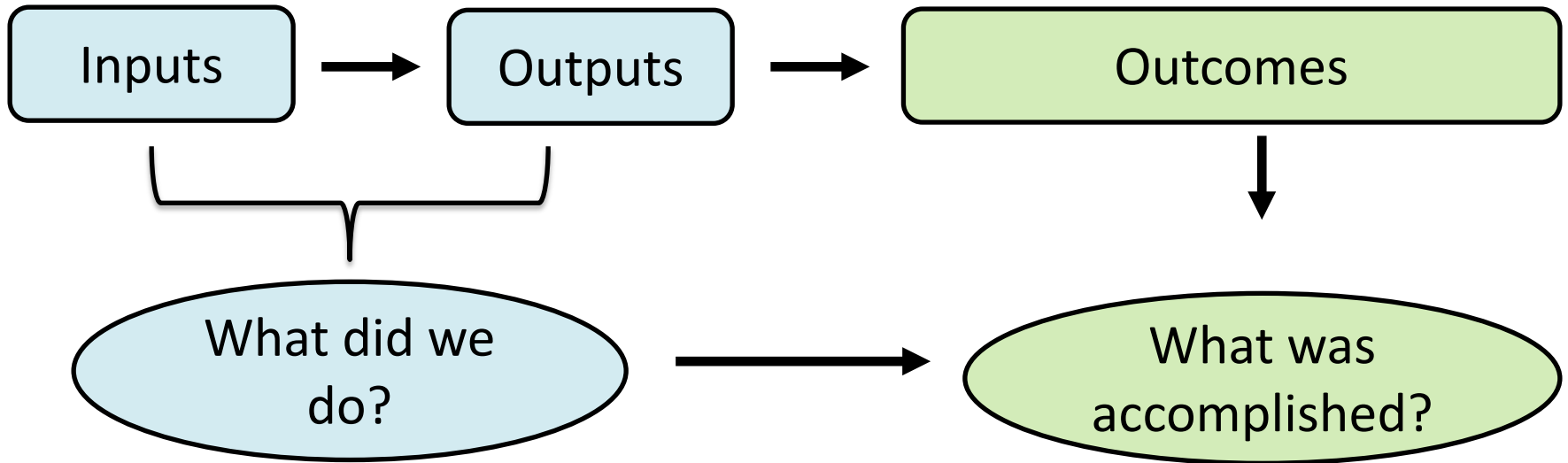
Overview topics- province scale

- Investments within provinces by strategy
- Variation in implementation relative to identified needs
- Projects and actions mapped within each province
- Examples:
 - Types and locations of habitat restoration projects
 - Total area accessible following barrier removal/floodplain reconnection
 - Location and role of hatchery production
 - Other associated work



Overview discussion

Status of performance evaluation



- Information gathered for overview feeds into outcomes evaluation
- Initiated strategy-scale outcomes evaluation through 2020 addendum Strategy Performance Indicators
- Contributes to overall Program evaluation

2020 Fish and Wildlife Program Addendum

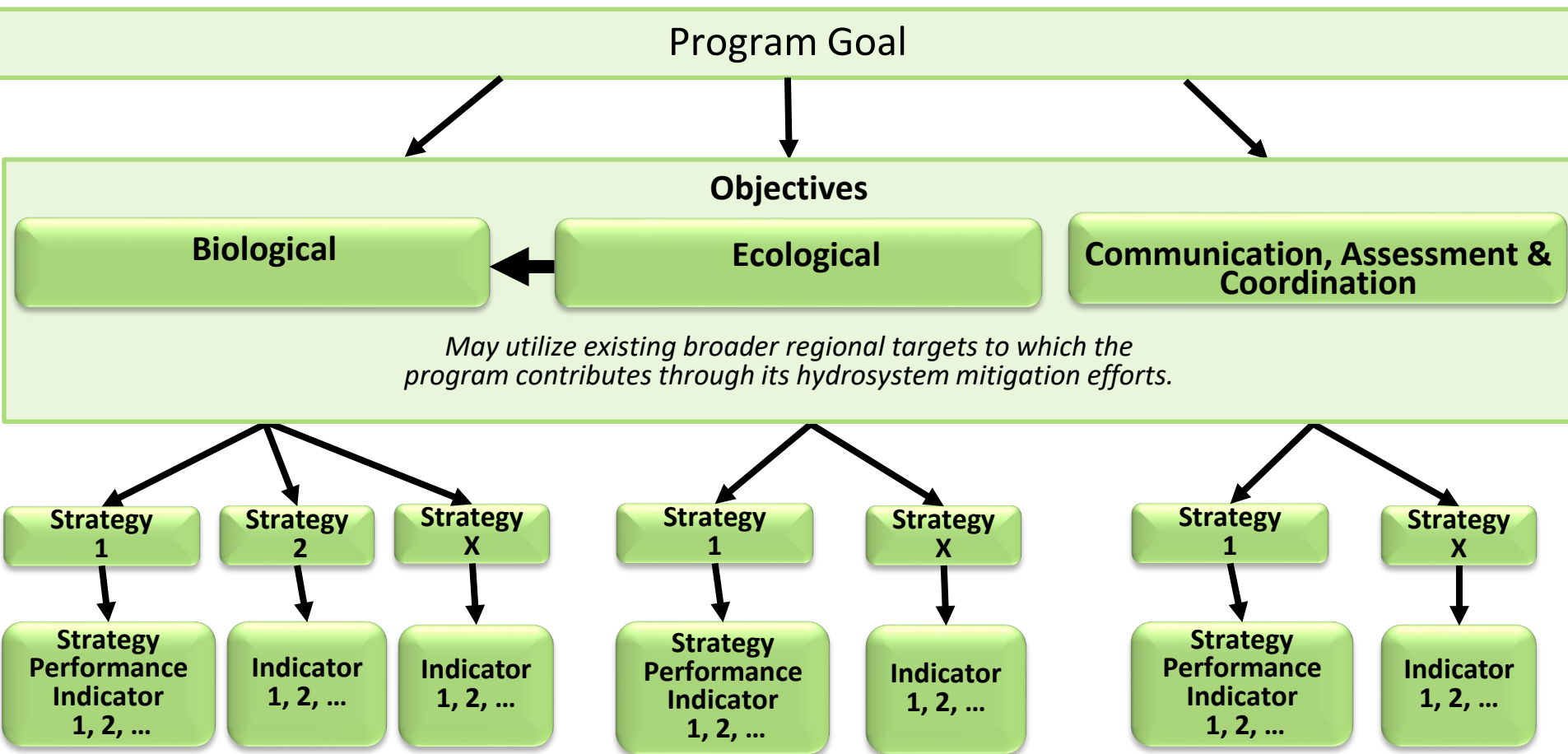
*The program's **goals** and **objectives** are consistent with the Act and with the program's vision, describing the changes in the environment and the biological performance that are needed to achieve the vision.*

All the program's substantive strategies ... contribute to achieving the program's goals and objectives... The Council needs an effective way to measure progress in implementing these strategies.

*...this addendum identifies a set of **strategy performance indicators** that can be used to assess progress in implementing the program strategies and improve the ecological and population conditions of the focal species.*

- 8 workshops during addendum process
- Identified 105 Strategy Performance Indicators
- Established Working Group to compile, evaluate and refine SPIs

Goals, Objectives and Strategy Performance Indicators



Strategy Performance Indicators

- During Amendment process Council and partners identified 105 SPIs for 18 strategies in the 2014/2020 Program
- Initial assessment indicates that there are 271 unique components to the SPIs - some data readily accessible; other data will require significant investment of time and resources
- Data and analysis will be linked to the Council's Program Tracker tool
- SPI Workgroup formed to assist in identifying, compiling, assessing and reporting on the indicators.

Data availability distribution for all strategies combined



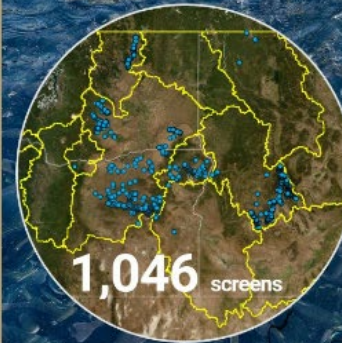
Strategy Performance Indicators: First Set

- Salmon and Steelhead Abundance (From Coordinated Assessments)
- Dam Counts
- Adult Survival
- Bull Trout Abundance
- Predator Management - Caspian Terns
- Predator Management – Pinnipeds
- Lake Trout removal

Assessments

(Some Text on modules in this section)

PROGRAM SCREENS FISH FROM IRRIGATION DIVERSIONS



Select Performance



Tracking the Program

In development



Program Goals and Objectives



Strategy Performance Indicators

Select Strategy Performance Indicators

Indicator Example: Dam Counts

Northwest Power and Conservation Council
Program Tracker

Home Performance Data Stories Resources

Program Goals and Objectives Strategy Performance Indicators

Strategy Performance Indicators In development

Strategy

Wild Fish Strategy Show All Data Hide All Data

Wild Fish

1. Progress toward the following regionally agreed-upon adult abundance escapement targets for natural-origin salmon and steelhead. These targets were developed by the NOAA Marine Fisheries Advisory Committee's (MAFAC) Columbia Basin Partnership Task Force. For the complete details on these targets and supporting information go to A Vision for Salmon and Steelhead, Goals and Pathways for Restoring Thriving Salmon and Steelhead to the Columbia River Basin. Phase 2 Report of the Columbia Basin Partnership Task Force to the NOAA Fisheries Marine Fisheries Advisory Committee, July 16, 2020 version. See Objective S1 above for the relationship of these targets to the program. (S1-3, S5-1) Show Data
2. Abundance of populations tracked as identified through Coordinated Assessments Partnership. (S1-4) Show Data
3. Total Bonneville Dam, Lower Granite Dam and Willamette Falls counts. (S1-5) Show Data
4. Trends in genetic diversity measures (heterozygosity, allelic diversity, private alleles, etc.) (S7-1) Show Data

Northwest Power and Conservation Council

Site developed by QW Consulting

1. Select Strategy

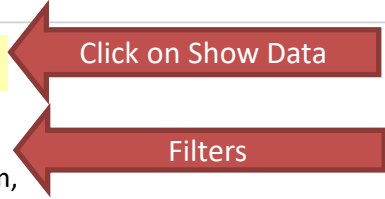
2. Click on Show Data

Indicator Example: Dam Counts

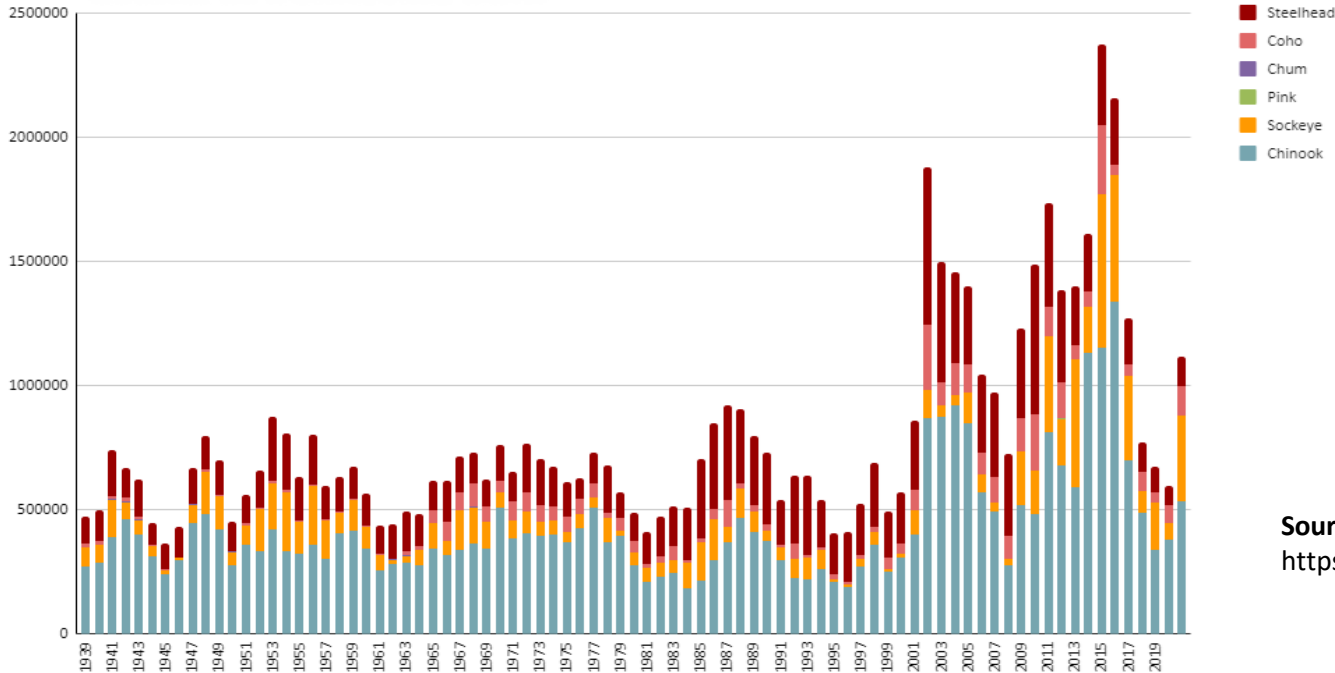
3. Total Bonneville Dam, Lower Granite Dam and Willamette Falls counts. (S1-5) (Show Data)

Location ▼
{ Options: All, Bonneville, Lower Granite, Willamette Falls }

Species ▼
{ Options: All, Steelhead, Coho, Chum, Pink, Sockeye, Chinook }



Counts at Bonneville Dam*



Source: Fish Passage Center,
https://www.fpc.org/fpc_homepage.php

* Counts for Chinook and coho include adults and jacks. Steelhead counts include clipped and unclipped fish.

Indicator Example: Bull Trout Abundance (Redd counts)

Strategy Performance Indicators In development

Strategy

Resident Fish Mitigation

Show All Data

Hide All Data

Resident Fish Mitigation

1. Bull Trout population abundance by subbasin. (R1-1) (Show Data)
2. Amount of protected or expanded habitat for Cutthroat Trout to provide for genetic integrity. (R2-2) (Show Data)
3. Number of core and conservation populations of Cutthroat Trout. (R2-3) (Show Data)
4. Redband Trout stream length (miles) and lake area (hectares) occupancy within each of the five geographic management units (GMUs). (R4-2) (Show Data)
5. Percent of currently occupied habitat that contains genetically unaltered Redband Trout for the five GMUs. (R4-3) (Show Data)
6. Redband Trout patch sizes at the population level. (R4-4) (Show Data)
7. Percent of Redband Trout population that is hybridized for the five GMUs. (R4-5) (Show Data)
8. Number of miles or kilometers of suitable stream habitat in the Flathead River. (R5-1) (Show Data)
9. Number of acres of suitable stream or reservoir habitat in the Kootenai River Basin. (R6-1) (Show Data)
10. Number of accessible miles of previously blocked suitable streams in the Kootenai River Basin. (R6-2) (Show Data)
11. Status and trend of Kokanee. (R3-2) (Show Data)
12. Status and trend of Burbot. (NF-2) (Show Data)
13. Status, trend and distribution of native freshwater mussels. (NF-3) (Show Data)
14. Discussions with fish managers are undertaken to evaluate and identify the best approach to assess remaining native focal fish losses. (C5-1) (Show Data)

Click on
Show Data

Indicator Example: Bull Trout Abundance (Redd counts)

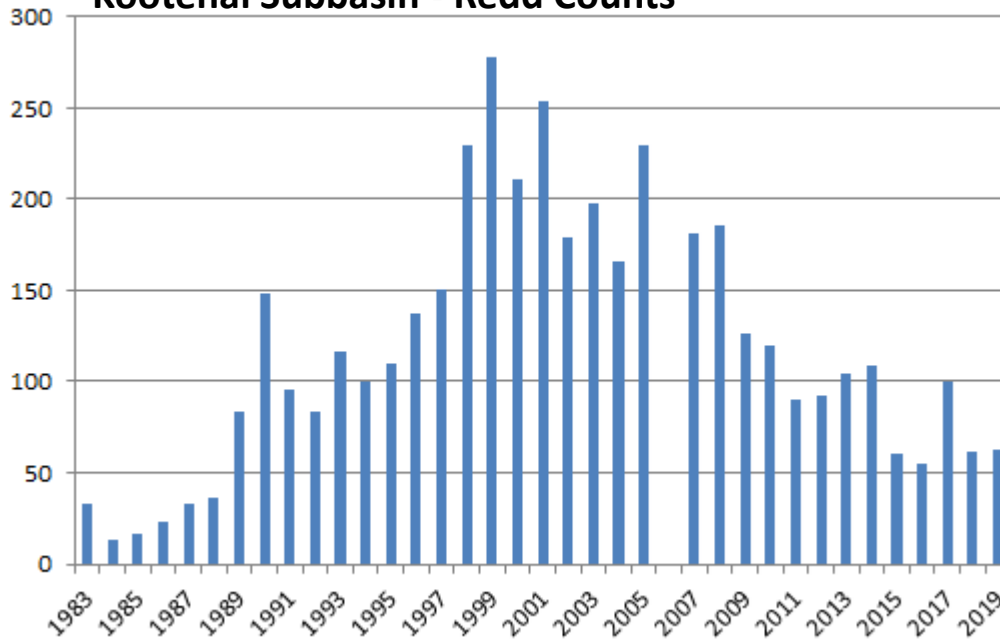
Resident Fish Mitigation

1. Bull Trout population abundance by subbasin. (R1-1) (Show Data)

Subbasin ▼
{ Options: All, Flathead, Kootenai }

Stream ▼
{ Options: All, Bear Creek, Blue Sky Creek, Clarence Creek, O'Brien Creek, Pipe Creek, Quartz Creek, West Fisher Creek, West Fork Quartz Creek }

Kootenai Subbasin - Redd Counts



Note:

Surveys were not conducted in 2006.
For some years, particularly early on, select sites were not surveyed

Data Source: StreamNet
<https://snq.streamnet.org/>

Indicator Example: Predator Management – Sea Lions

The screenshot shows the Northwest Power and Conservation Council Program Tracker interface. At the top, there is a navigation bar with 'Home', 'Performance', 'Data', 'Stories', and 'Resources'. Below this, there are tabs for 'Program Goals and Objectives' and 'Strategy Performance Indicators'. The main heading is 'Strategy Performance Indicators' with a yellow 'In development' tag. A dropdown menu is set to 'Predator Management', with 'Show All Data' and 'Hide All Data' buttons. A list of nine indicators follows, with the sixth indicator highlighted in yellow. Two red arrows point to the dropdown menu and the sixth indicator.

Northwest Power and Conservation Council
Program Tracker

Home Performance Data Stories Resources

Program Goals and Objectives Strategy Performance Indicators

Strategy Performance Indicators In development

Strategy

Predator Management Show All Data Hide All Data

Predator Management

1. The number of breeding pairs of Caspian Terns and availability of suitable nesting habitat on East Sand Island. 32 Compare the breeding pairs to the target range of 3,125 to 4,375, and the suitable nesting habitat to the target of one acre (E4-1) (Show Data)
2. Cormorant colony size at East Sand Island. Compare to management goal that colony size does not exceed management average of 5600 breeding pairs (E4-2) (Show Data)
3. Predation rate on ESA-listed juvenile salmonids by Caspian Terns in the Columbia Plateau region compares to target of less than 2% (E4-3) (Show Data)
4. Exploitation rate on Northern Pikeminnow measuring nine inches or greater in total length (228 mm fork length). 35 Compare the exploitation rate to the 10-20 percent annual target. (E4-4) (Show Data)
5. Emigration, spatial distribution, and index of abundance of non-native Northern Pike in the Columbia River Basin. 36 Evaluate trend to determine if the numbers and range are reducing over time. (E4-5) (Show Data)
6. Counts of sea lions observed at Bonneville Dam, the lower Columbia River, estuary and Willamette Falls. Compare trend to determine if the impacts are decreasing over time. (E4-6) (Show Data)
7. Proportion of the adult salmon and steelhead run consumed by sea lions in the lower Columbia River and estuary, with emphasis on upper Columbia spring Chinook and wild Winter Steelhead. (E4-7) (Show Data)
8. Number of adult salmon and steelhead, White Sturgeon, and Pacific Lamprey consumed by sea lions at Bonneville Dam, the lower Columbia, estuary and Willamette Falls. (E4-8) (Show Data)
9. Annual average catch rate of Lake Trout in Upper Priest, Flathead, and Pend Oreille lakes (R1-1, R3-1) (Show Data)

Select Strategy

Click on Show Data

Indicator Example: Predator Management – Sea Lions

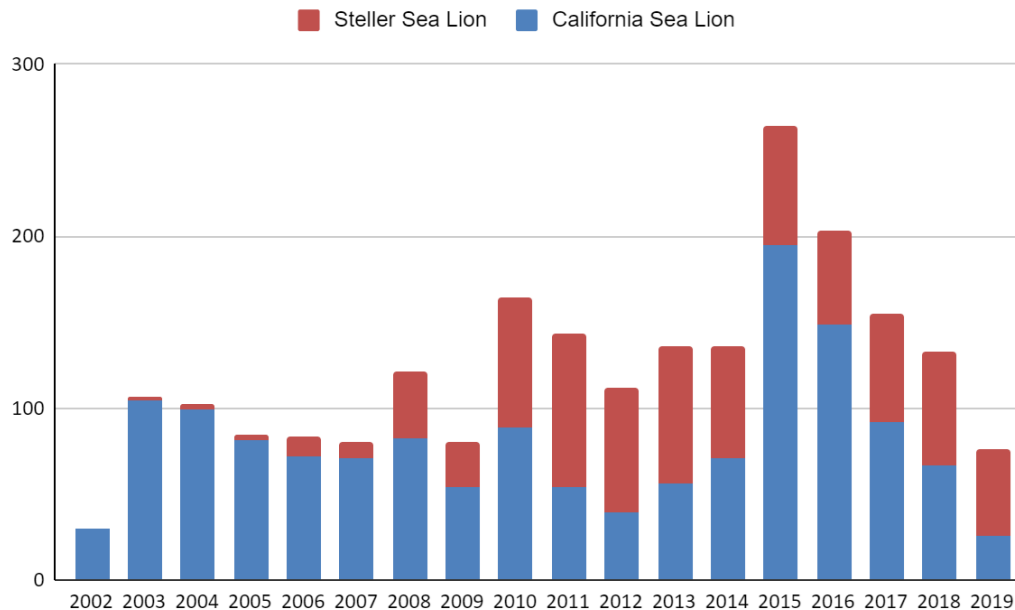
6. Counts of sea lions observed at Bonneville Dam, the lower Columbia River, estuary and Willamette Falls. Compare trend to determine if the impacts are decreasing over time. (E4-6) (Show Data)

Click on Show Data

Location {options: All, Below Bonneville, Willamette Falls, Lower Columbia/Estuary}

Filters

Counts below Bonneville Dam*



Source: Tidwell et al. 2020. Evaluation of pinniped predation on adult salmonids and other fish in the Bonneville Dam tailrace, 2019. <https://usace.contentdm.oclc.org/digital/collection/p16021coll3/id/833>

* Minimum estimated number, includes California and Steller sea lions

Next Set

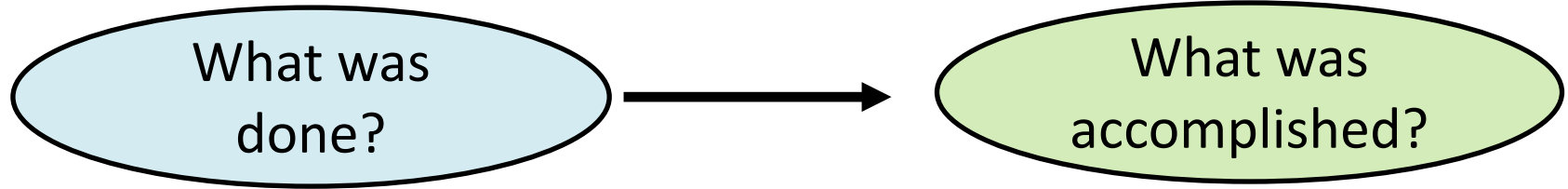
Strategy Performance Indicators

- Water Quality Strategy
 - Mainstem temperatures
 - Total Dissolved Gas
- Mainstem Hydrosystem Flow and Passage Strategy
 - Juvenile Survival
 - Flows
 - Travel Times
 - Powerhouse Encounter Rates
 - Percent Transported
 - SARs
- Sturgeon Strategy
 - Abundance
 - Other

Current schedule

- September Workshop - Review indicator data. Discuss progress reporting. Identify potential future work.
- Follow up with managers on specific data questions.
- Continued participation by staff/managers in Coordinated Assessments (CAX); MAFAC-related indicator data; Hatchery indicators
- Develop Year-one report

Next steps



- Gather data on inputs and outputs for program and strategies at basin and province scales
 - Includes data gathered for SPIs
 - GIS- map inputs and outputs
 - Create visuals and summary
- Strategy Performance Indicators
 - Workgroup meetings
 - Tracker and website
 - Program evaluation
 - Data analysis (including GIS)
 - Reporting

Fish and Wildlife Program

- **40 year mitigation effort for effects of hydrosystem**
- **Extensive and complex program that requires time and resources to review and evaluate**

Photo credit: NPCC

Extra slides

Specific topic areas

Political

- Major provisions of the F&W Program adopted into Hydrosystem operations through EIS
- Program Amendment process involves full participation and representation of perspectives of Tribes, States, Feds, and interested parties

Ecological outcomes of F&W Program

Communication

Capacity building

Economical

Specific topic areas

Cultural

Political

- An essential aspect of the Council's work
- We communicate with technical and non-technical audiences through Tracker/ story maps, forums, ISAB, outreach stories, etc.
- Communication impacts the work being done in the region

Ecological outcomes of F&W Program

Communication

Capacity building

Economical

Specific topic areas

Cultural

Political

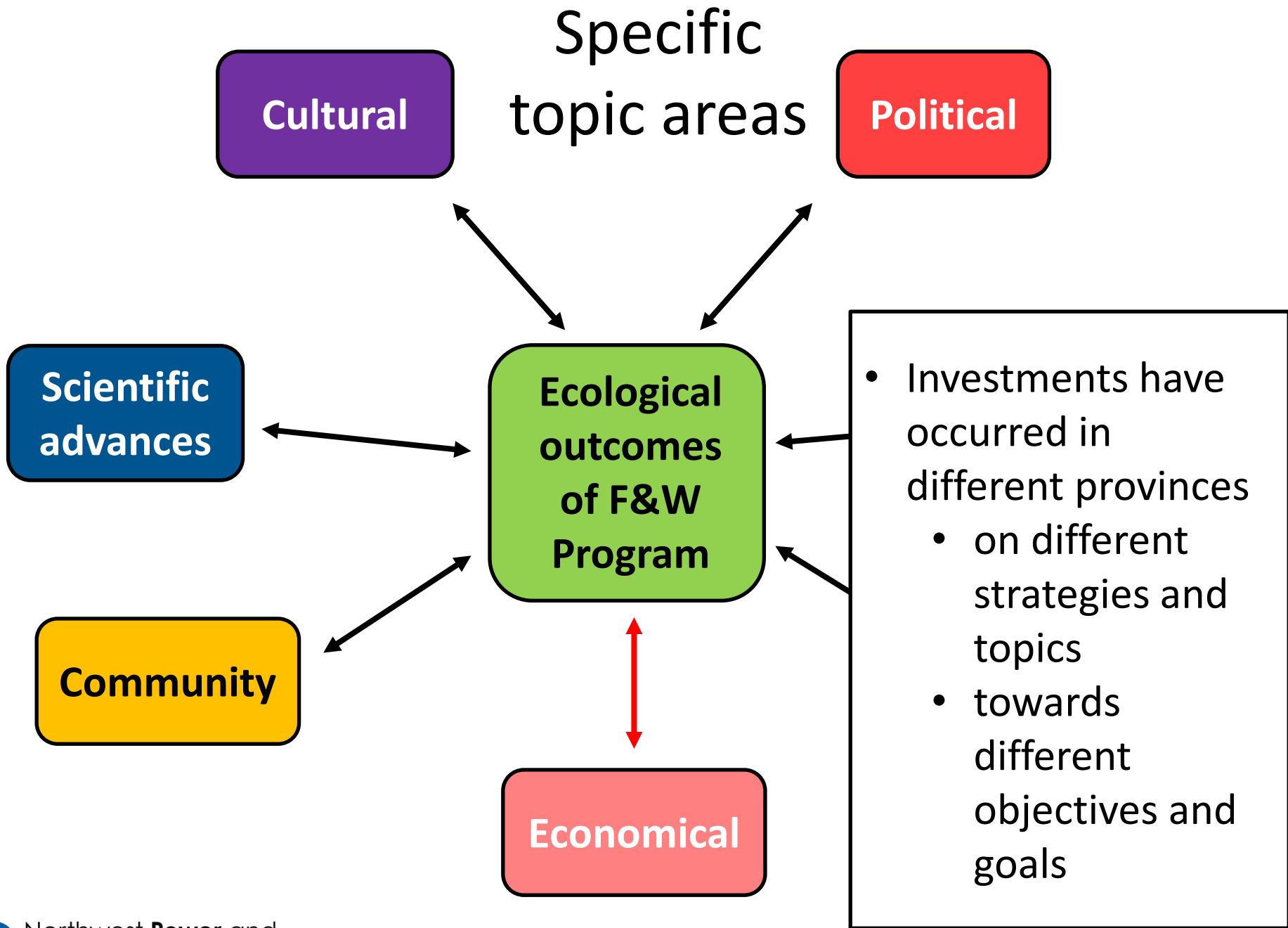
- Funding from the F&W Program has enabled organizations to:
 - Enhance fish and wildlife programs
 - Participate in regional forums
 - Conduct RM&E
 - Construct or upgrade infrastructure

Ecological outcomes of F&W Program

Communication

Capacity building

Economical



Specific topic areas

Cultural

Political

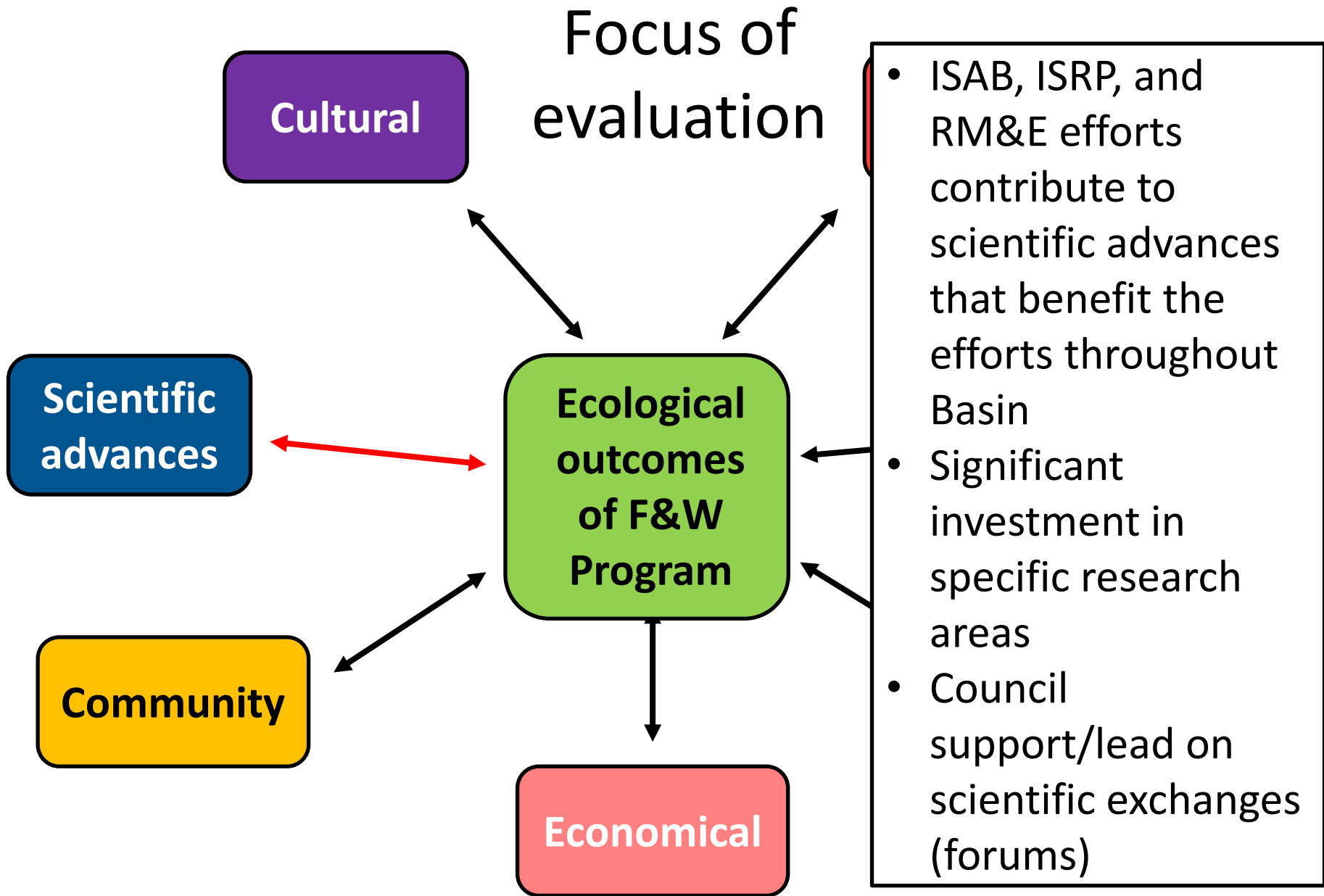
Scientific advances

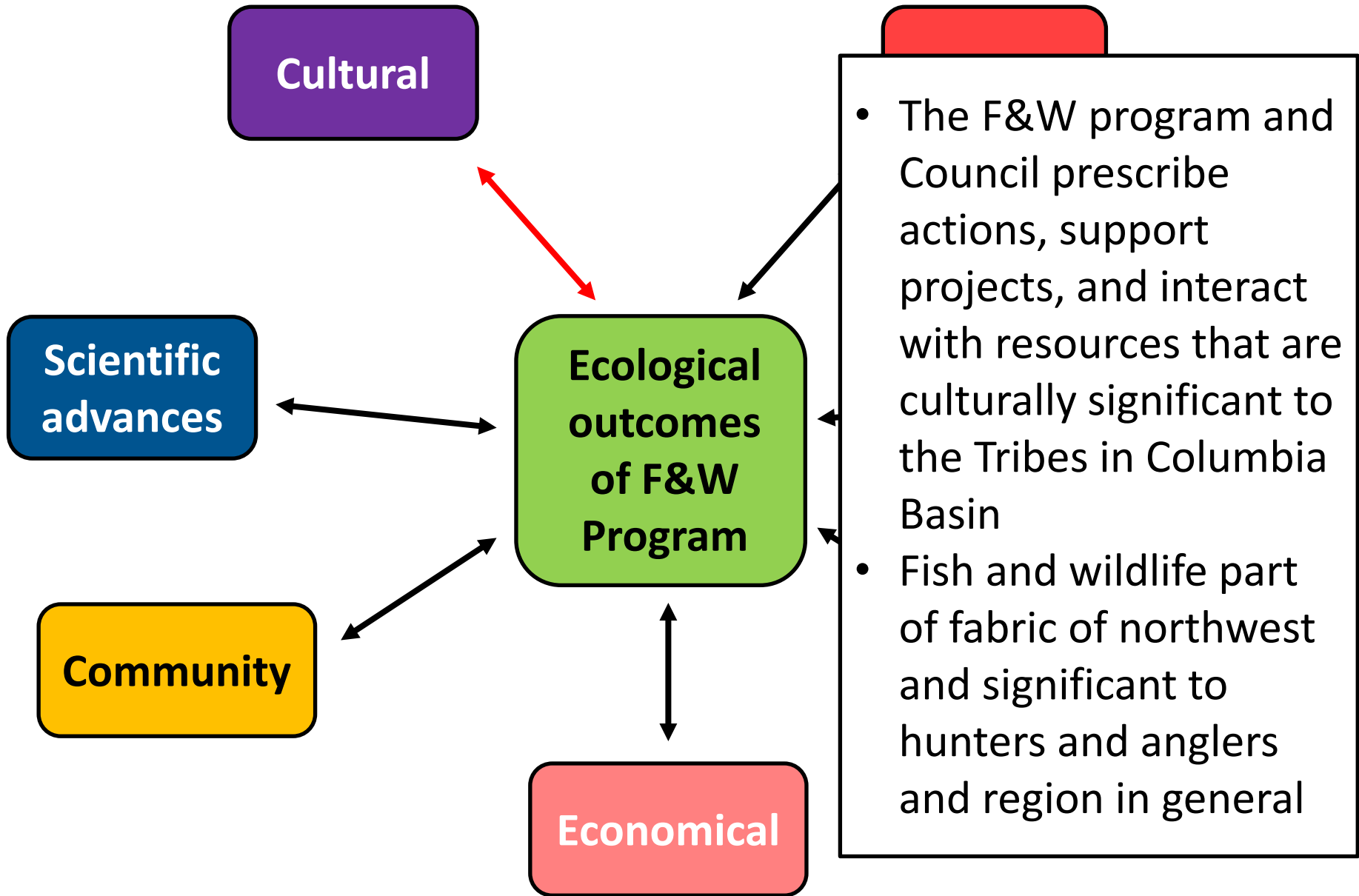
Ecological outcomes of F&W Program

Community

Economical

- The Council is part of the community of people and organizations working towards similar goals
- Multiple entities are funded through the F&W Program
- Broad collaboration on projects or in forums, etc.





Fish and Wildlife Program

Program Performance and Adaptive Management

