Apr 26th, 1:30 PM - 3:00 PM

Building Habitat and Climate Resiliency: The Science Behind the Chehalis Basin ASRP

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BUILDING HABITAT + CLIMATE RESILIENCY:

THE SCIENCE BEHIND THE CHEHALIS BASIN ASRP

DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

Washington Department of FISH and WILDLIFE

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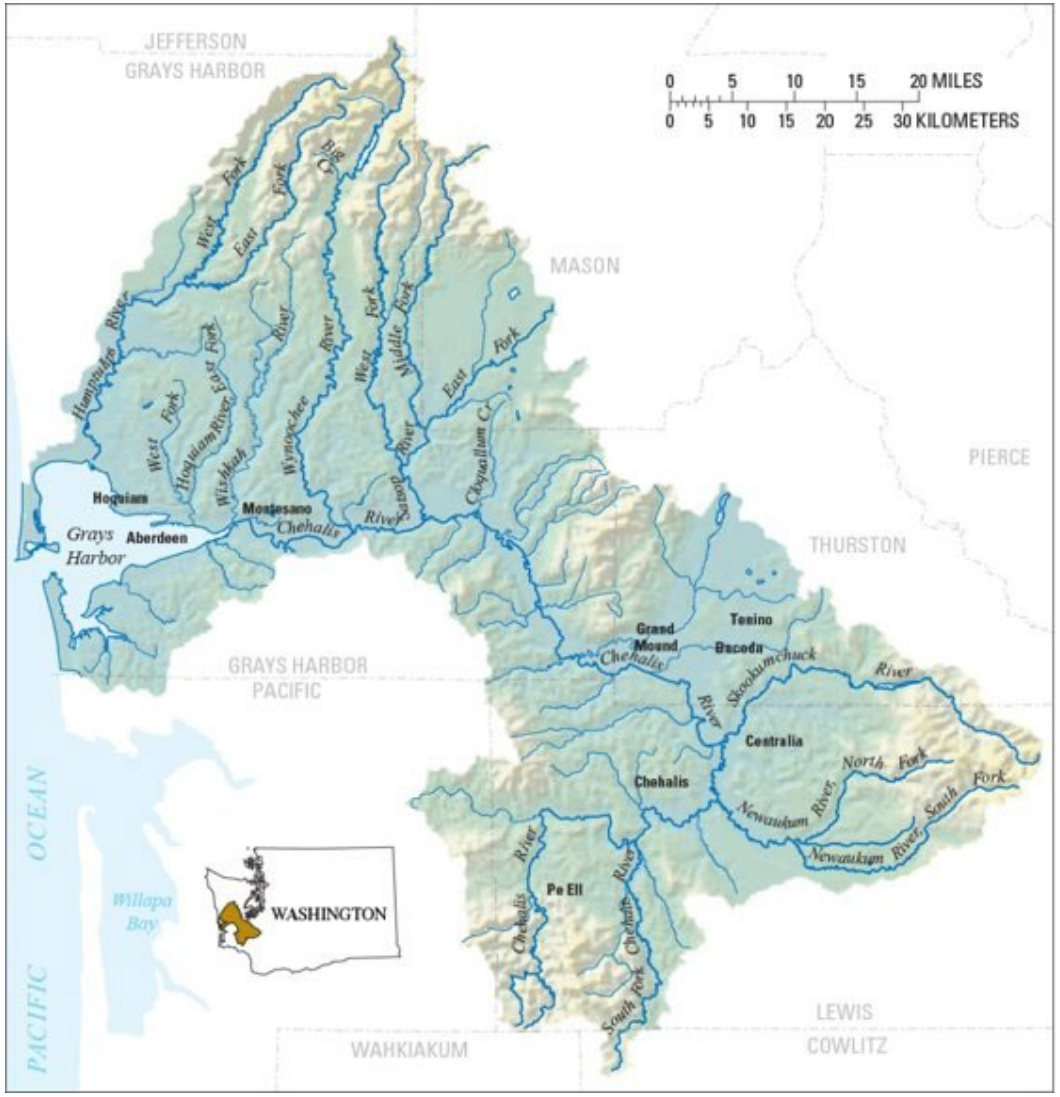
A VISION FOR A RESILIENT FUTURE

"The vision of the ASRP is to utilize the best available scientific information to protect and restore habitat in the Chehalis Basin in order to support healthy and harvestable salmon populations, robust and diverse populations of native aquatic and semi-aquatic species, and productive ecosystems that are resilient to climate change and human-caused stressors while honoring the social, economic, and cultural values of the region and maintaining working lands"

WHAT IS THE CHEHALIS BASIN STRATEGY?

An integrated strategy to address **aquatic species habitat restoration** and flood damage reduction



https://chehalisbasinstrategy.com/

THE AQUATIC SPECIES RESTORATION PLAN

Habitat and Process Protection

Protect intact ecosystems, unique habitats, and strategic areas that support critical ecosystem functions and priority species.

Restoration

Restore ecosystem functions to support native aquatic and semi-aquatic species.

Community Planning

Effectively plan for current and future conditions in the Chehalis Basin.

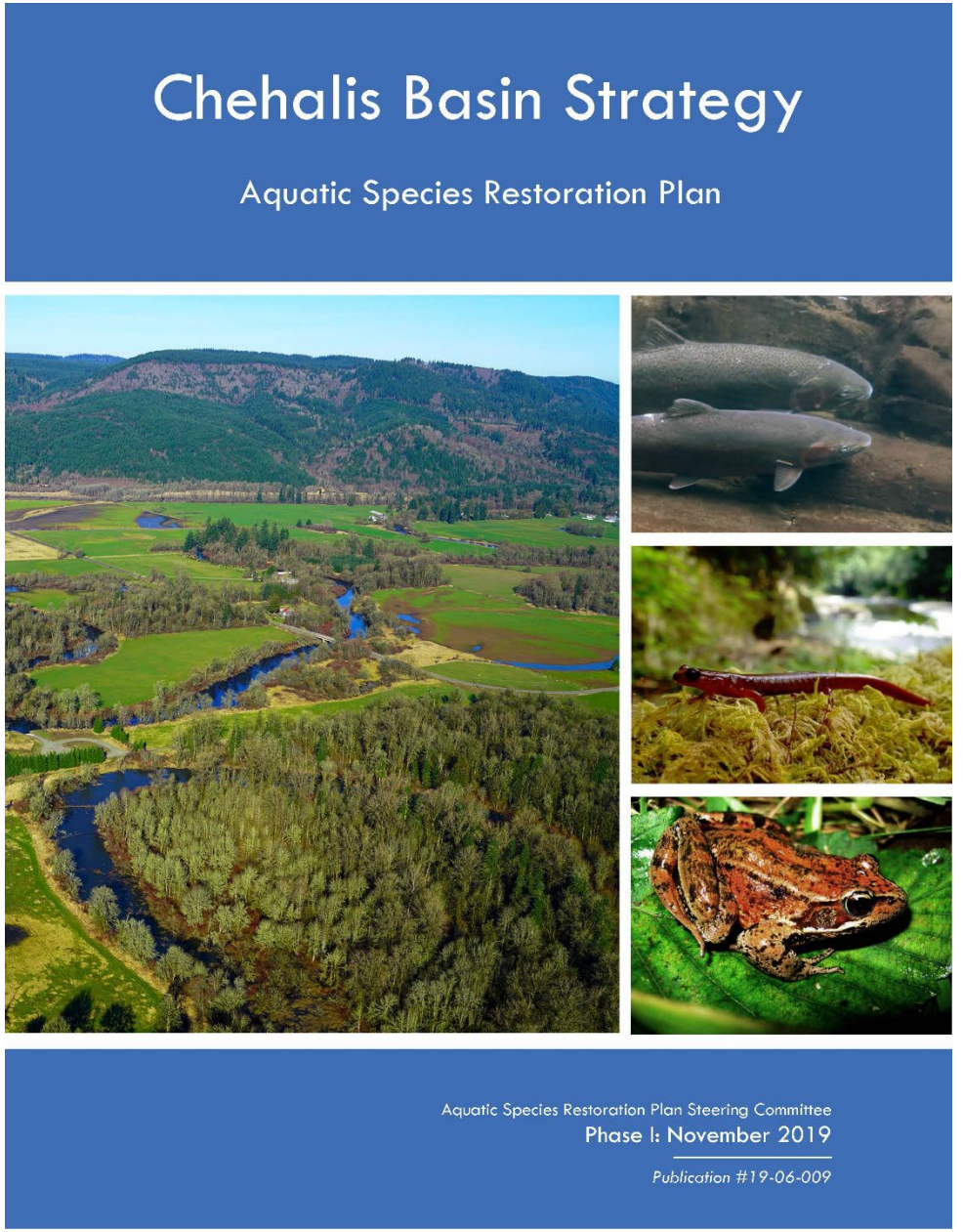
Community Involvement

Engage landowners and Chehalis Basin communities to ensure a successful plan and support implementation of actions.

Institutional Capacity

Build institutional capacity of existing organizations for restoration, protection, and planning processes to ensure the ASRP is a community-based restoration program.

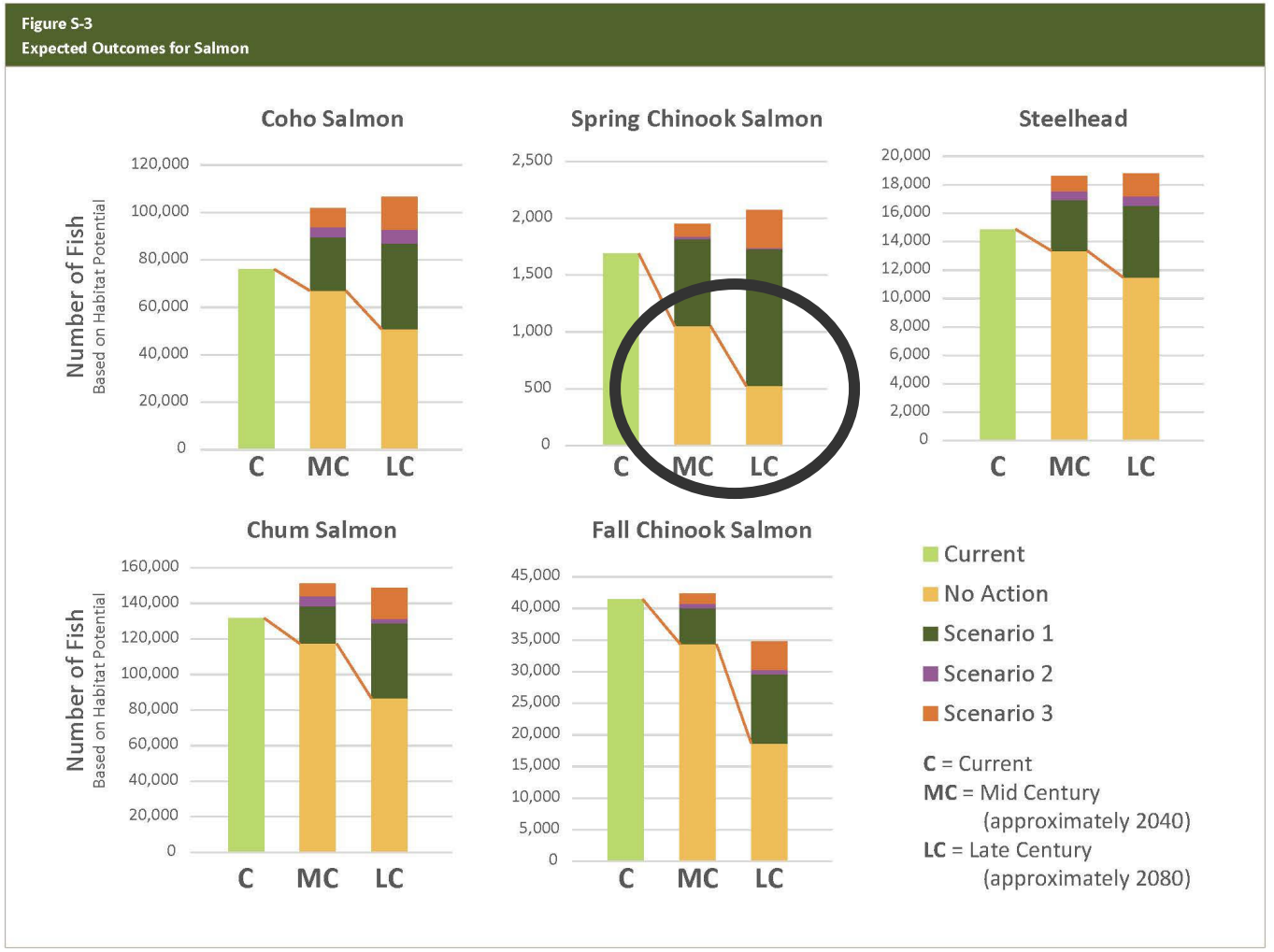
https://chehalisbasinstrategy.com/asrp/



WHY ASRP?

"Climate change and future human development will increasingly threaten the viability of aquatic species in the Chehalis Basin. If meaningful actions are not taken, the best available science projects devastating effects—for example, the basin's spring-run Chinook salmon, an important food source for tribal communities as well as for orca whales, could be extinct by the end of the century. "

ASRP Phase 1 Document, Executive Summary



CLIMATE CHANGE IN THE CHEHALIS

Mainstem Chehalis River low flows, July 2021

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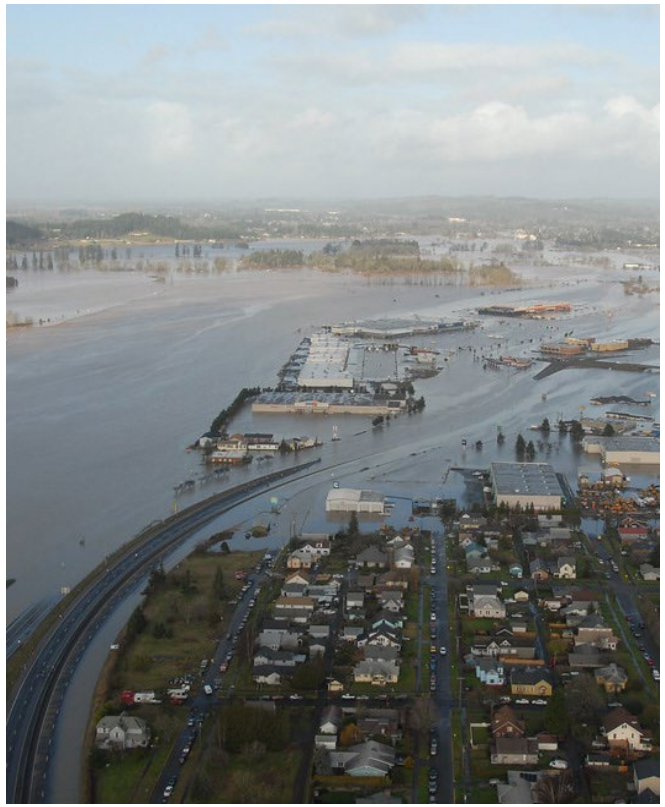


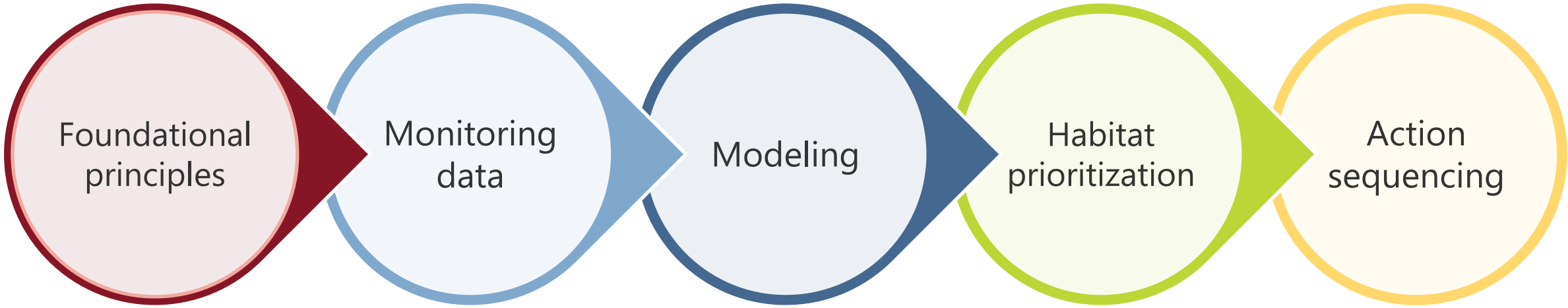
The floods of 2007 and 2009 caused nearly one billion dollars in damages, shut down entire segments of I-5, and put communities' health and safety at risk.

CLIMATE SCIENCE & RESTORATION PLANNING

Considerations for including climate science:

- How will available science be used?
  - Baseline physical habitat conditions
    - Current and projected
  - Species status & known population trend drivers
  - Adaptive Management
- Acknowledge what we *don't* know, and how it can influence results
  - Ex: Flow modeling not available for entire basin

HOW ASRP UTILIZES CLIMATE SCIENCE

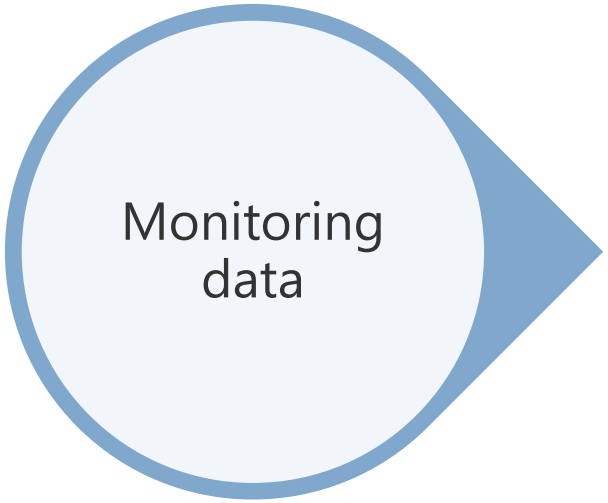


Scientific Judgement

Foundational principles

Scientific Foundation: Basis for developing strategies and actions

- Concepts
  - Role of habitats
  - Focus on select indicator species
- Assumptions
  - Climate change
  - Restoration of ecological processes
- Uncertainties
  - Seasonal variability of weather patterns
  - Historical geomorphic and habitat information

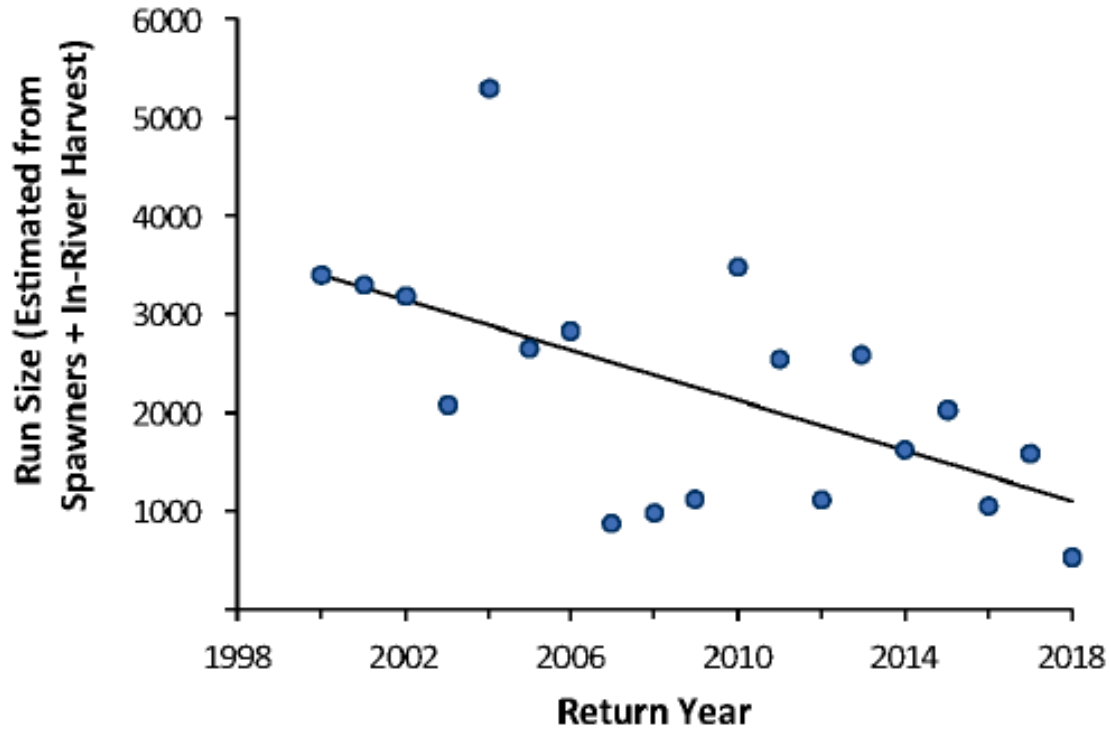


Robust datasets: baseline information to inform projections and priorities

- Thermalscape monitoring
  - Basin-wide stream temperature monitoring network
- Fish In – Fish Out
  - Spring Chinook distribution and abundance
- Spawner index surveys
- Amphibian surveys
  - Distribution of stream associated amphibians

Monitoring data

Figure 3-1
Trend in Chehalis In-River Wild Spring-Run Chinook Salmon Run Size Estimates



Modeling

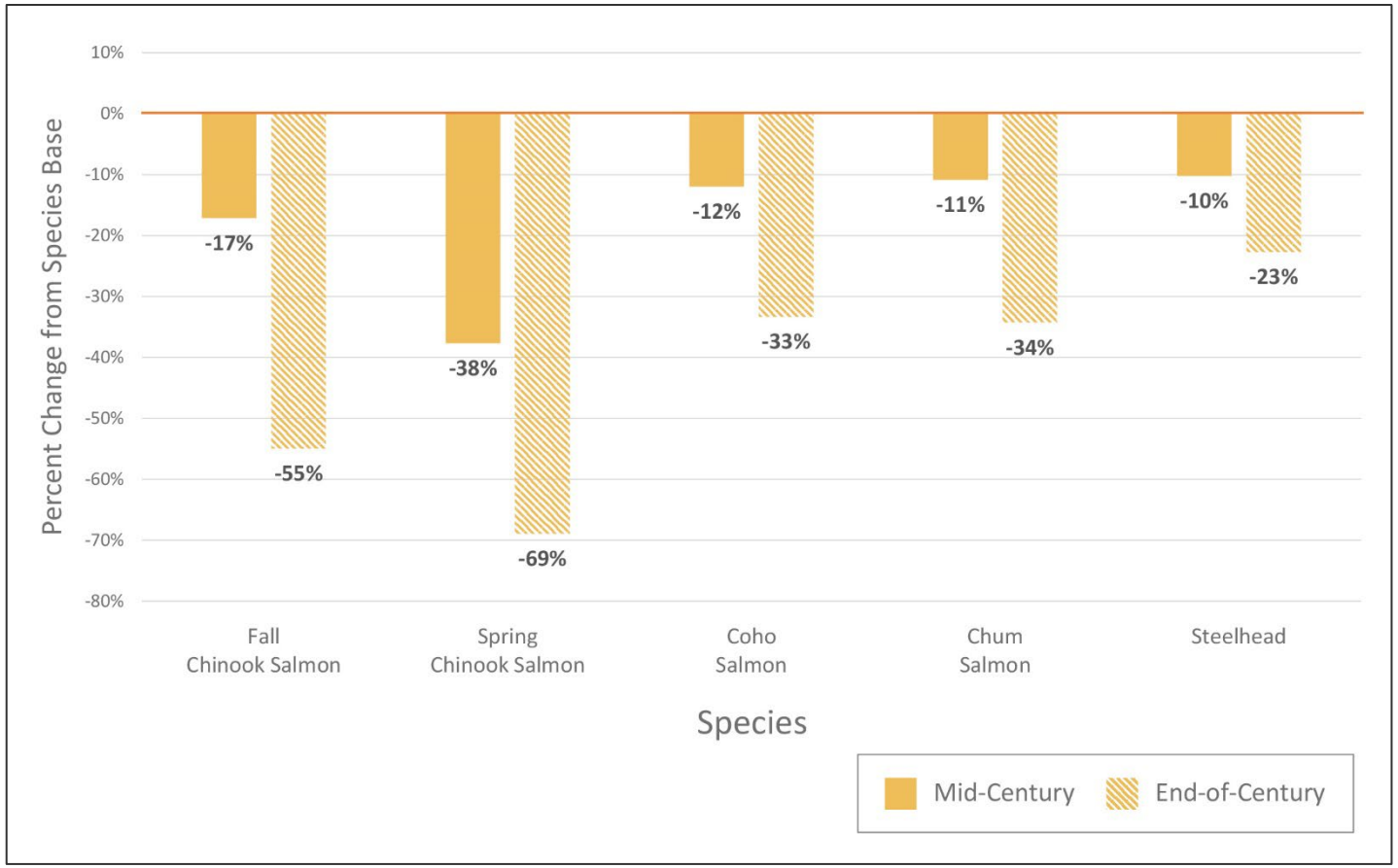
Two model approach tested assumptions and identified path forward at basin scale

- Ecosystem Diagnostic Tool (EDT)
- NOAA Life Cycle Model (LCM)

  - Incorporated
    - Projected mainstem flow changes
    - Projected stream temperature distribution
    - Species abundance and distribution
    - Habitat constrictions
    - Shade availability analysis

Modeling

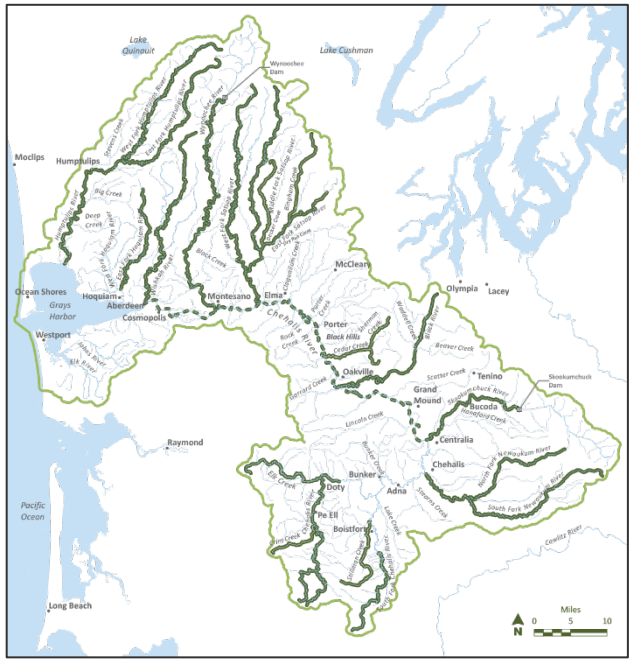
No Action Scenario, EDT:



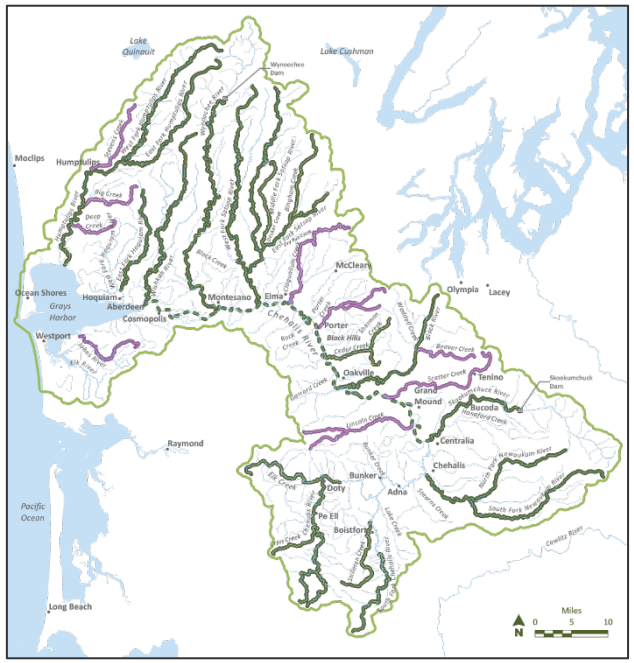
Habitat prioritization

Developed scenarios to understand level of action needed and potential outcomes

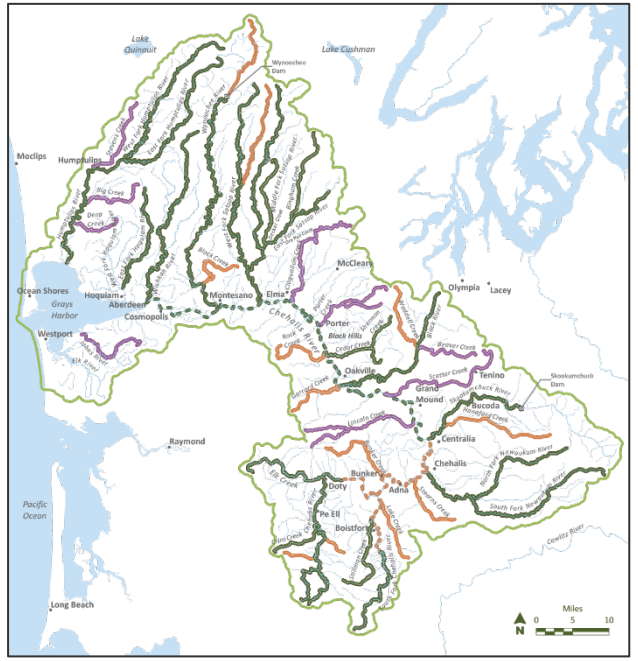
Scenario 1



Scenario 2



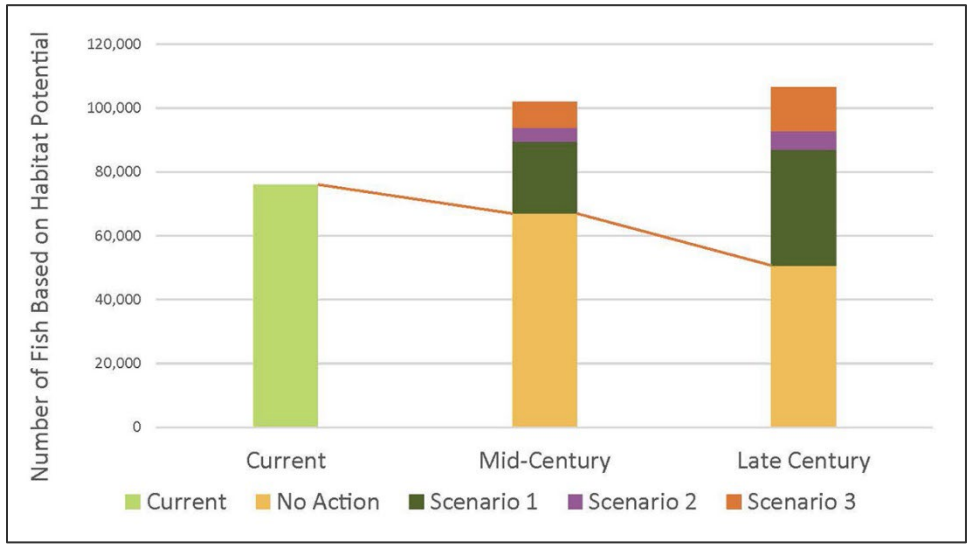
Scenario 3



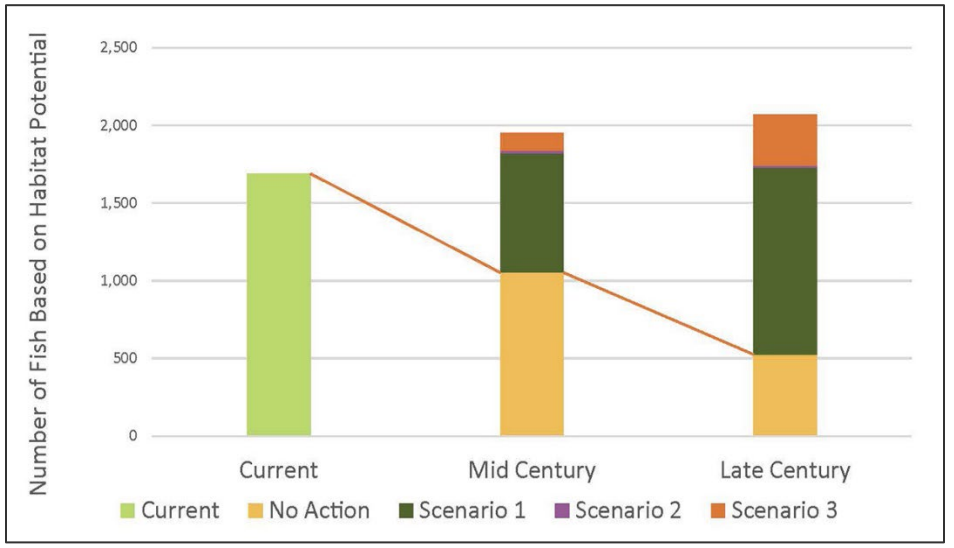
Habitat prioritization

PROJECTED SCENARIO OUTCOMES

Coho (EDT)



Spring Chinook (EDT)



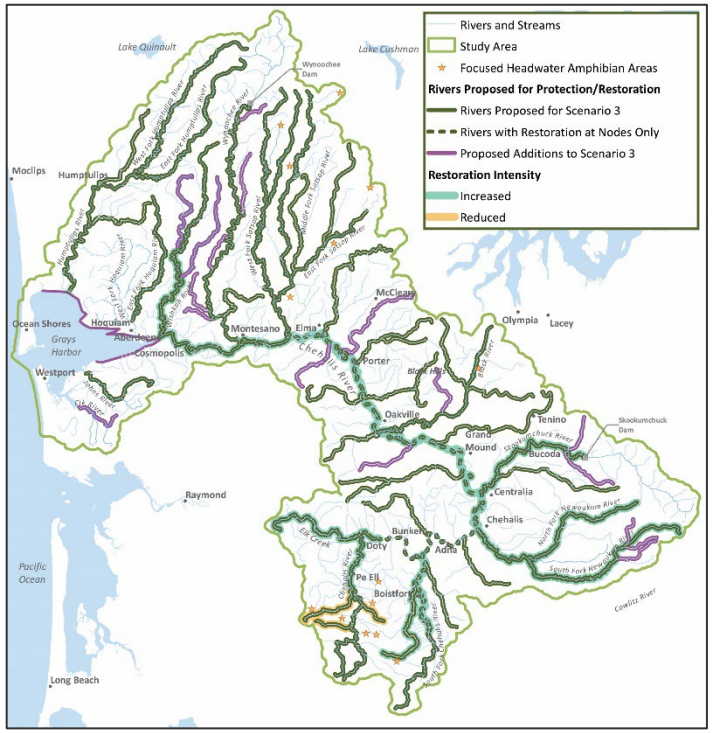
Action sequencing

Refined scenario to ensure actions and areas would promote ecosystem resiliency

- Conducted climate resilience audit based on:
  - Species trends
    - New data on non-salmon species
  - EDT
    - Instream actions to reduce temperature
    - Identified barrier priorities
  - LCM
    - Shading to reduce temperature
    - Floodplain reconnection to increase hyporheic exchange and storage

Action sequencing

Refined scenario to ensure actions and areas would promote ecosystem resiliency



- Climate resilience audit results:
  - Added/removed priority areas
  - Increased/decreased intensity of action
    - Shading for spring chinook core habitats
    - Coastal tailed frog restoration in headwaters
  - Added specific actions to increase resiliency
    - Beaver ponds
    - Riparian restoration

Action sequencing

Prioritized and sequenced actions to guide implementation and investments

- Sequenced actions spatially & temporally based on climate drivers:
  - **Physical habitat**
    - Limiting factors for aquatic species
      - Temperature
      - Flow
      - Key habitat quality, availability
  - **Indicator species**
    - Abundance, distribution trends of at-risk species

Action sequencing

Prioritized and sequenced actions to guide implementation and investments

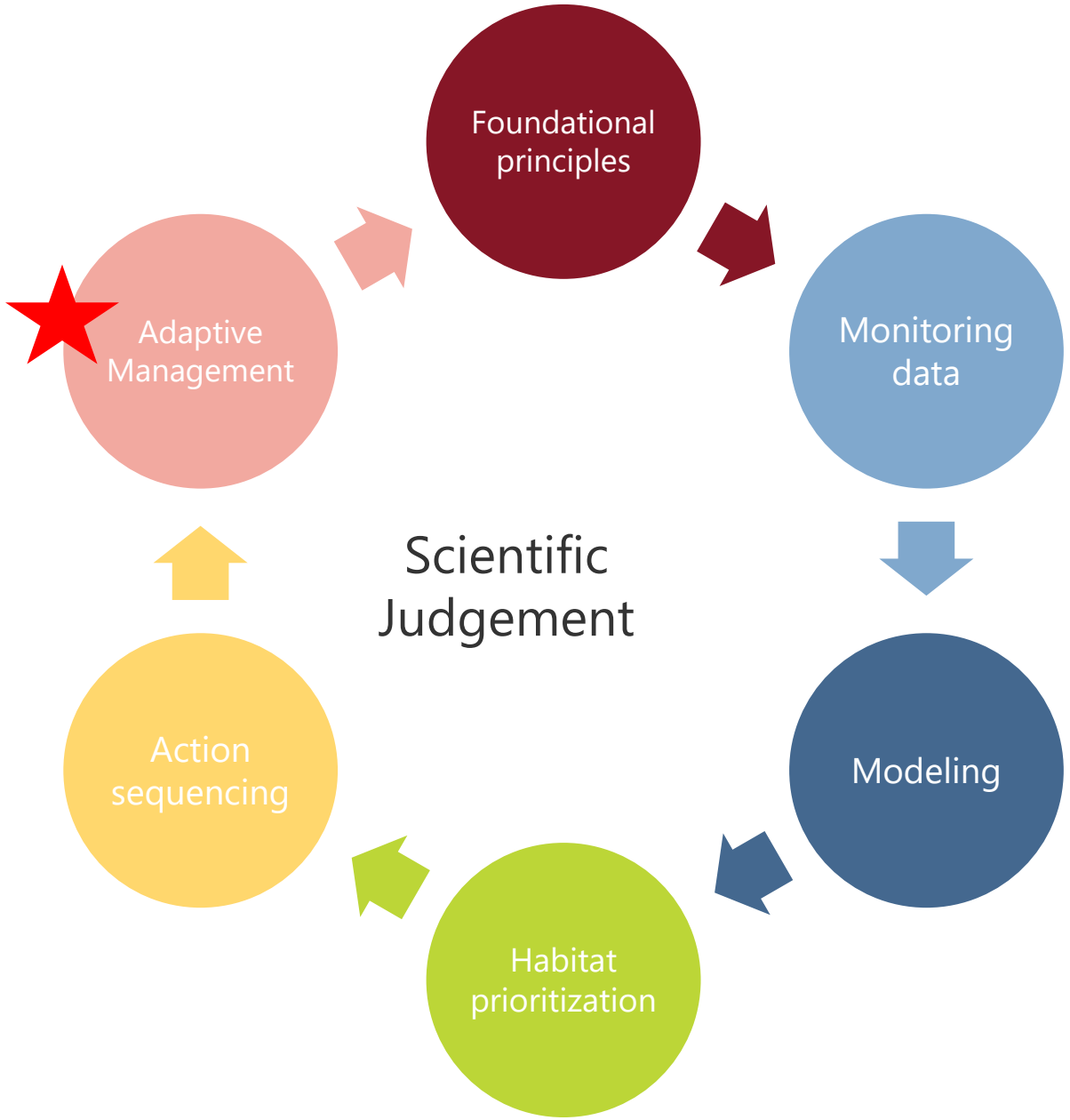
- **Physical habitat drivers**
  - Temperature
    - Initiate riparian plantings in areas most suited to cool water over time
    - Conduct restoration in upper stream reaches first, not mainstem
  - Flow
    - Test experimental methods to increase summer flows
  - Key habitat quality, availability
    - Restore core habitats that support multiple species
    - Restore connectivity of habitats

Action sequencing

Prioritized and sequenced actions to guide implementation and investments

- **Indicator species**
  - Restore and protect core habitats for
    - Spring Chinook
    - Steelhead
    - Oregon Spotted Frog
    - Coastal Tailed Frog

NEXT STEPS


Foundational principles
Monitoring data
Modeling
Habitat prioritization
Action sequencing
Adaptive Management
Scientific Judgement

Adaptive Management

- Three data sampling programs inform formal and informal feedback loops:
  - Status and Trends
  - Project Effectiveness
  - Hypothesis Testing

- Adjustments to priorities, locations and sequencing supported by robust datasets

QUESTIONS OR DISCUSSION