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January 3, 2024

MEMORANDUM

TO: Council Members

FROM: Mark Fritsch

SUBJECT: Overview of Project #1990-077-00, *Development of Systemwide Predator Control*

BACKGROUND:

Presenter: Allan Martin – *Project Manager for Pacific States Marine Fisheries Commission*
Eric Winther, *Project Lead for Washington Department of Fish and Wildlife*
Grant Waltz, *Project Lead for Oregon Department of Fish and Wildlife*

Summary: Allan, Eric and Grant will provide a brief overview of the history (including results over time), the recent effort to address conditions placed on the project during the project's last review by the Council and discuss future challenges and directions for the project. The recent effort to address these conditions, based on the ISRP's comments, was a collective effort over the past three years by the co-managers to assess the projects implementation actions.

Relevance: Project #1990-077-00 is a basin-wide effort to harvest piscivorous northern pikeminnow (*Ptychocheilus oregonensis*). The project started in 1991 to reduce predation on juvenile salmonids during their out-migration from natal streams to the ocean. The current sport reward fishery has evolved as the primary tool to achieve this goal after having tested numerous other gear and traps to remove pikeminnows. The sport reward fishery runs each year from May-September using registration/creel check

stations on the Columbia and Snake rivers. Anglers can harvest fish from the mouth of the Columbia up to Priest Rapids dam and up the Snake River to Hells Canyon dam.

The Pacific States Marine Fisheries Commission (PSMFC) oversees the technical, contractual, administrative and fiscal portions of the program. It utilizes its member states of Washington and Oregon to help implement the program. Oregon Department of Fish and Wildlife (ODFW) provides exploitation estimates and the biological evaluations of the program. Washington Department of Fish and Wildlife (WDFW) operates the registration/creel stations and conducts the dam angling component of the program.

The project sponsors conduct an evaluation of the system-wide response of pikeminnow and other predaceous fish to removal fisheries and estimate the reduction in predation relative to pre-program levels each year. Smallmouth bass and walleye are also monitored to document any potential compensation by these predators as a result of the pikeminnow removals.

Workplan: 2023 Fish and Wildlife Division Work Plan; Program Planning and Coordination

Background: Following is a chronology of the effort associated with the project sponsors to coordinate a plan to address conditions place on Project #1990-077-00, *Development of Systemwide Predator Control* as part of the [Mainstem and Program Support Project Review](#) in August 2019.

Following is the Council recommendation from that review:

Continue implementation through FY 2020. Sponsor to meet with project cooperators and interested parties to coordinate a plan for addressing ISRP qualifications 1,2 and 4. A draft plan will be submitted in August 2020 for ISRP and Council review. Recommendation for implementation in FY 2021 and beyond will be determined based on review of the plan. Council encourages sponsor to publish peer-reviewed papers on this work to benefit the region and beyond (ISRP qualification #3).

The Council recommendation was based on the ISRP's final review ([ISRP document 2019-02](#)) as follows.

Qualifications:

The ISRP recommends that the proponents describe their responses to the ISRP's comments and suggestions below in their upcoming annual report covering FY 2019 accomplishments.

- 1. This long-running project has fully developed annual objectives and well-established field and analytical tasks. However, project's methods were developed over twenty years ago. Consequently, the proponents should determine (a) if it is possible to use their extensive capture-recapture data in the Barker Model to estimate survival, recruitment, movement, and abundance; (b) if their estimators for abundance based on CPUE are still valid; and (c) how well those approximations align with potential estimates produced from capture-recapture data. Validation of the abundance estimator is important since it is linked to the project's predation index. The proponents should also determine whether current bioenergetic models could provide improved estimates of consumption of juvenile salmonids, instead of indices of consumption.*
- 2. The ISRP asks the proponents to determine if direct measures of predation due to colonial waterbirds that have been developed can be applied to piscivorous fishes in the Basin. Although results from analyses on a variety of parameters including PSD, W_r , diet composition, and indices of abundance, consumption, and predation failed to detect signs of compensatory responses in northern pikeminnows, smallmouth bass, and walleye, their data suggest that localized compensatory responses may be occurring. The proponents should perform analyses to evaluate trends in locations that exhibit potential compensation by these predators. We also recommend that the proponents work with the Basin's avian researchers to see if their efforts to remove northern pikeminnow have prompted a compensatory effect in colonial waterbirds. Recently, direct measures of predation due to colonial waterbirds have been developed. The data collected by this project appear to be suitable for a similar analysis. We ask the proponents to explore this possibility with the avian researchers.*
- 3. We encourage the proponents to work with others to publish peer-reviewed papers describing their work and findings. It appears that the most recent work published from this very large effort was published before the turn of the last century.*
- 4. Although it is clear that the project is using adaptive management to change and refine its actions, a brief description of the process being used is needed. Is it a formal process or an ad hoc one prompted by an apparent need?*

On August 31, 2020, the Council received a response submitted by Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, and Pacific States Marine Fisheries Commission, as sponsors, regarding Project #1990-077-00, *Development of Systemwide Predator Control*. The submittal is intended to address the conditions the Council placed on the project as part of the Mainstem and Program Support Project Review in August 2019.

On September 24, 2020, the ISRP provide their review ([ISRP document 2020-10](#)). The ISRP found that the response “Meets scientific review criteria (conditional).” The ISRP stated that the response indicated that the PSMFC, ODFW and WDFW (sponsors) agree with the majority of our recommendations and intend to explore actions to address them, “*it is unclear how and when the recommendations will be addressed. Consequently, the ISRP requests that the sponsors respond collectively to the ISRP review and indicate how the recommended actions will be addressed. Understanding the need for flexibility*”. The ISRP suggested that the sponsors and the Council staff agree on a mutually determined date for a response to the following requests, preferably before the field season in 2021:

1. *Action Implementation*: Based on the proponents’ response, the ISRP asks the three co-managers to report which actions will be implemented to assess and reduce impacts of pikeminnow predation on salmon and steelhead recovery, explain how they will be conducted, and provide a timeline for each effort. The actions identified in the response include use of the Barker Model, Brownie Bird Band Model, and Wisconsin Fish Bioenergetics Model, as well as evaluation of compensatory or additive mortality of juvenile salmonids and compensatory responses of other predators. If funds need to be reallocated to accomplish these tasks, the response should update the original budget to reflect the reallocations.
2. *SMART Objectives*: The proponents need to develop SMART objectives for the new activities the proponents plan to pursue over the next 5 years.
3. *Adaptive Management*: A project with three independent co-managers and other collaborators requires a formal adaptive management process. The ISRP asks the PSMFC, ODFW, and WDFW to develop a collective adaptive management process for both the Sport Reward Fishery and the ODFW M&E components and provide a description of the process to the ISRP.

On May 26, 2022, the Council received a response (i.e., “2021 adaptive management project update”) from ODFW (on behalf of the sponsors) intended to inform the Council of the progress to date.

On August 31, 2023 the Council received a response from Pacific States Marine Fisheries Commission, Washington Department of Fish and Wildlife, and Oregon Department of Fish and Wildlife intended to address the conditions requested from the ISRP in their last response review (ISRP document 2020-10).

On October 4, 2023, the Council received a final review from the ISRP ([ISRP document 2023-4](#)) and found that the condition placed on the project as part of the Mainstem and Program Support Project review has been addressed and now “*Meets scientific review criteria*”. The ISRP, as part of this recent review, also provided additional comments and suggestions intended to improve and strength the project in the future.

Based on the favorable ISRP review the Council found that the conditions placed on the project were satisfied and sent a confirmation letter to Bonneville.

More Info:

- [Summary](#) for Project #1990-077-00, *Development of Systemwide Predator Control* from *cbfish.org*
- [Proposal narrative](#) from the Mainstem and Program Support Project Review of August 14, 2019.

Columbia River Basin Northern Pikeminnow Management Program



Allan Martin
PSMFC Project Manager
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Northwest Power and Conservation Council

2024



Overview

Topics

PSMFC

1. A Brief Program History
2. Summary of 2019 ISPR Review & Council Recommendations
3. Adaptive Management Process

WDFW

1. Sport-Reward Fishery Description
2. Historical Results
3. Accomplishments and Recent Advancements

ODFW

1. Biological Evaluation History
2. ISRP/Council Recommendations
3. Compensatory Effects and other non-native predators
 - Walleye
 - Smallmouth Bass
4. NOAA BiOp Direction



History

Objective and Goals

Objective:

Increase the survival of out-migrating juvenile salmon and steelhead by reducing the number of larger, predatory pikeminnow in the mainstem Columbia and Snake rivers

Goals:

1. Remove 10-20% of predatory-sized pikeminnow per year
2. Evaluate response of pikeminnow to sustained fisheries
3. Check for compensatory predation by smallmouth bass and walleye
4. Evaluate effect of program on salmonid predation



Program Structure

Partner Roles

- **BPA**
 - 1) Provides funding and overall program support to meet BiOp action agency mitigation responsibilities
- **PSMFC**
 - 1) Administrative, contractual, fiscal and technical oversight
 - 2) Administer voucher payments
 - 3) Additional funding support for services, supplies and seasonal personnel
- **WDFW**
 - 1) Implement the system-wide Northern Pikeminnow Sport-Reward Fishery (19 Registration Stations)
 - 2) Collect biological data on catch
 - 3) Implement/Supervise Dam-Angling Fishery
- **ODFW**
 - 1) Evaluate exploitation rate and size composition of northern pikeminnow harvested in various fisheries
 - 2) Evaluate response of pikeminnow to sustained fisheries
 - 3) Check for compensatory predation by smallmouth bass and walleye.
 - 4) Evaluate effect of program on salmonid predation.



2019 ISRP Review & Council Recommendations

Summary

1. *Validate the current methods and indices
2. *Explore compensatory response of predators and salmonids
3. Peer reviewed publication
4. *Formal adaptive management process

* Astricts indicate Council recommendations



2019 ISRP Review & Council Recommendations

Challenges and Opportunities

- COVID-19
 - Stay at home order
 - Staffing issues
- Typical Staff turnover
- Flat funded since 2017
- ODFW portfolio management
- Development of a formal adaptive management process
- Evaluate alternative biological models to compare and recalibrate existing models
- Explore eDNA
- Collaboration with other predator control programs
- Address NOAA direction to reduce ESA listed take



Adaptive Management Committee

History

- The NPMP Adaptive Management Committee (AMC) was formed July 2020
- Direct partner participants and higher-level supervisory managers were formally designated as the NPMP AMC in August 2021
 - Pacific States Marine Fisheries Commission
 - Bonneville Power Administration
 - National Oceanic and Atmospheric Administration
 - Oregon Department of Fish and Wildlife
 - Washington Department of Fish and Wildlife



Adaptive Management Committee

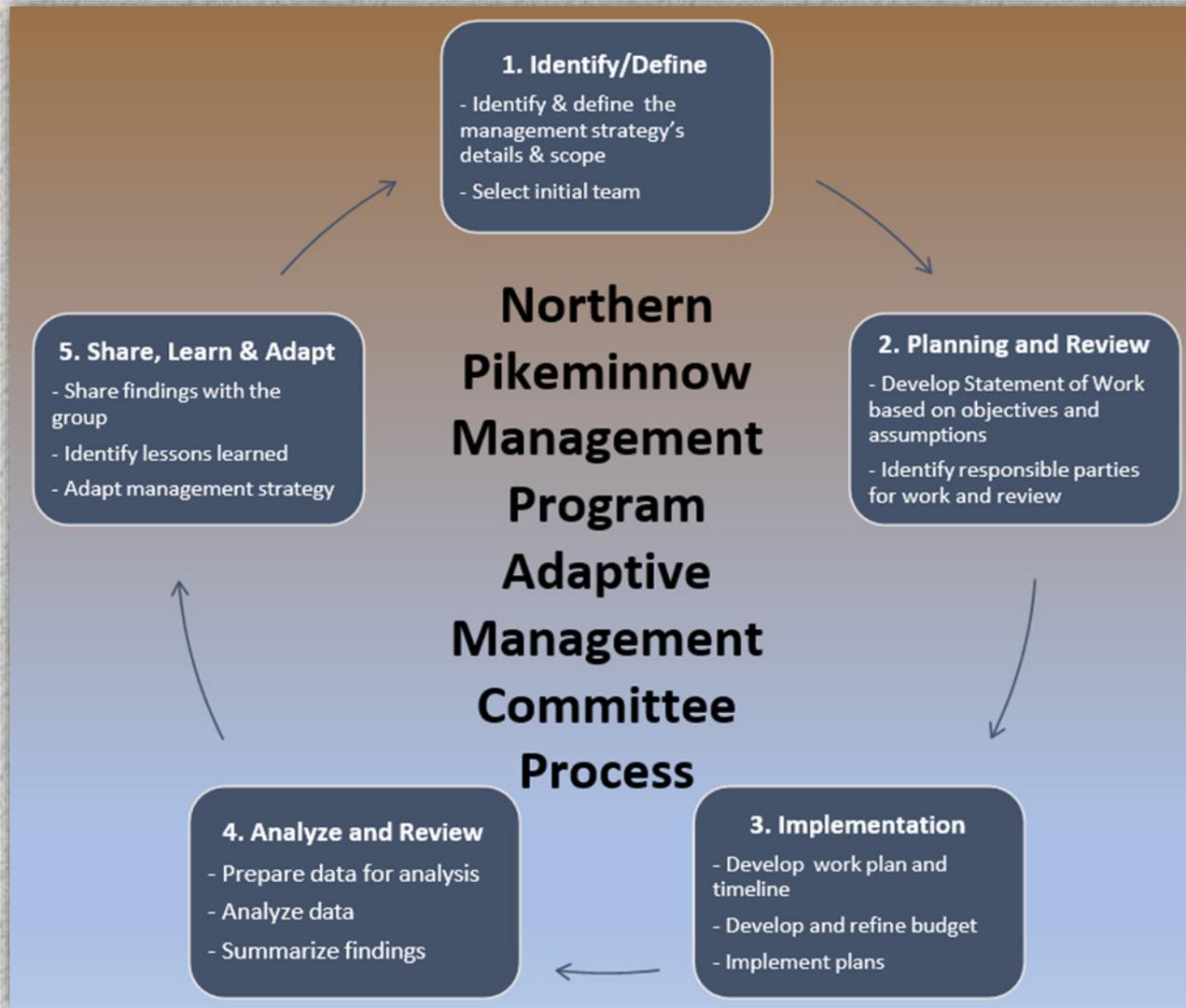
Benefits

- Review, discuss and adopt changes in a cooperative and ongoing collaborative process
 - Address NOAA concerns regarding ESA listed take
 - PIT tag only for biological evaluation
 - Increased tiered payments and tagged NPM rewards
 - Streamlined angler registration process
 - Identified funding and developed timeline for addressing aging infrastructure
 - Ongoing coordination to prioritize funding



Adaptive Management Committee

Process



Northern Pikeminnow Sport-Reward Fishery Program

Eric Winther
WDFW Project Leader



Washington
Department of
FISH and
WILDLIFE



Northern Pikeminnow



- Native to Pacific NW.
- Are effective predators on juvenile salmonids at 9" total length (age 4-5).
- A long-lived fish reaching 13-16 years age in the Columbia and Snake rivers.
- Altered habitat in the Columbia River (Dams) resulted in the number of predator sized fish increasing.



Northern Pikeminnow Sport-Reward Fishery (SRF)



- **Objective:** Increase the survival of outmigrating juvenile salmon and steelhead by creating a public fishery that incentivizes recreational anglers to harvest larger, predatory Pikeminnow from within program boundaries on the mainstem Columbia and Snake rivers
- **Goals:** Harvest 10-20% of predatory-sized (>9" total length) Pikeminnow per year from within program boundaries.



SRF Promotion and Angler Outreach



- To achieve exploitation goals, the SRF must recruit and inform new anglers in order to generate sufficient angler participation.



Pikeminnow SRF

- The Pikeminnow SRF pays recreational anglers via a tiered payment system which gives higher rewards the more cumulative fish an angler catches. The tiered system incentivizes anglers to spend more effort in pursuit of receiving higher per fish rewards.



Pikeminnow SRF

- Current SRF reward levels are:
\$6 for the first 25 fish
\$8 for fish 26-200
\$10 for each fish over 200



Pikeminnow SRF

- Tagged fish pay anglers \$200-500 and provide the Pikeminnow Program with critical data used to determine SRF exploitation.



Pikeminnow SRF



- Each year, from May-September there are 18-24 Pikeminnow Registration Stations operating daily to facilitate angler participation in the SRF.



SRF Accomplishments



SRF Accomplishments

- Since 1991, an average of 165,000 Northern Pikeminnow have been harvested by SRF participants each year.



SRF Accomplishments

- More than 5.59 million predator sized Northern Pikeminnow have been harvested by SRF anglers to date.



SRF Accomplishments

- Anglers participating in the Pikeminnow SRF have expended more than 1 million (1,002,226) angler days of effort since the SRF began full implementation in 1991.



SRF Accomplishments

- The SRF has successfully reached the 10-20% exploitation objective each year since 1997.



SRF Accomplishments



New for iOS and Android

Pikeminnow Registration Mobile App

Download the NEW Pikeminnow Registration mobile app today!



- Register for the Northern Pikeminnow Sport-Reward Program using your mobile phone
- View past registrations
- See current program rules and station times

iOS Download

Android Download



SRF Accomplishments

- Other SRF achievements include:
 - public seminars
 - club presentations
 - Sport show participants
 - Pikeminnow Facebook page
 - Interviews with media
 - Website - www.pikeminnow.org



Pikeminnow Accomplishments

- In addition to the SRF, WDFW Dam Anglers have also removed 62,139 Pikeminnow from within the BRZ's of The Dalles and John Day dams since 2010.



Pikeminnow/SRF accomplishments



- Besides WDFW's successful implementation of the SRF for the past 33 seasons, and of Pikeminnow Dam Angling since 2010, ODFW's effective monitoring and evaluation of the Program is equally important.



Northern Pikeminnow Biological Evaluation and Monitoring

Grant Waltz
ODFW Project Leader
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Biological Monitoring and Evaluation

- The Program was designed and implemented to monitor and evaluate the Sport Reward Fishery and Dam Angling Fishery
 - **Northern Pikeminnow (native)**
 - Smallmouth Bass (introduced, late 1800's)
 - Walleye (introduced, mid-1900's)
- 'rapid assessment' tools
- Electrofishing



Biological Monitoring and Evaluation



Biological Monitoring and Evaluation

Evaluation



Tag (mark) fish



Fish recovered



Exploitation



Predation reduction

Biological Monitoring



Consistent sampling



Length

Weight

Abundance

Diet

Time sampled



Long-term population trends

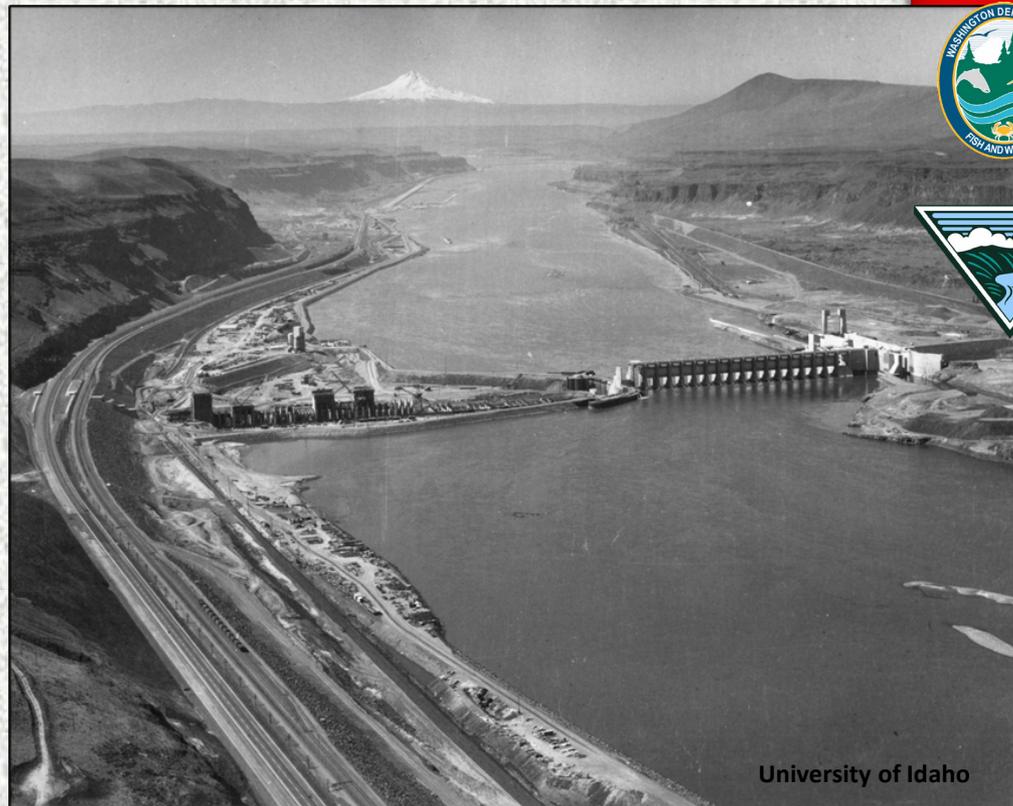


Biological Monitoring and Evaluation

Compensatory Responses



University of Idaho



- Fundamental alterations
- Future river conditions and ecological dynamics
- Compensatory responses
 - Smallmouth bass
 - Walleye
- Standard comparison across species

Biological Monitoring and Evaluation



INDEPENDENT
SCIENTIFIC
REVIEW PANEL

- Received a suite of recommendations, generally focused on biological monitoring and evaluation, circa 2019
- The Program focused on five main recommendations
 - 1) Improving mark/recovery models
 - 2) Measures of abundance
 - 3) Bioenergetics
 - 4) Avian predation models
 - 5) Avian and piscine compensatory responses



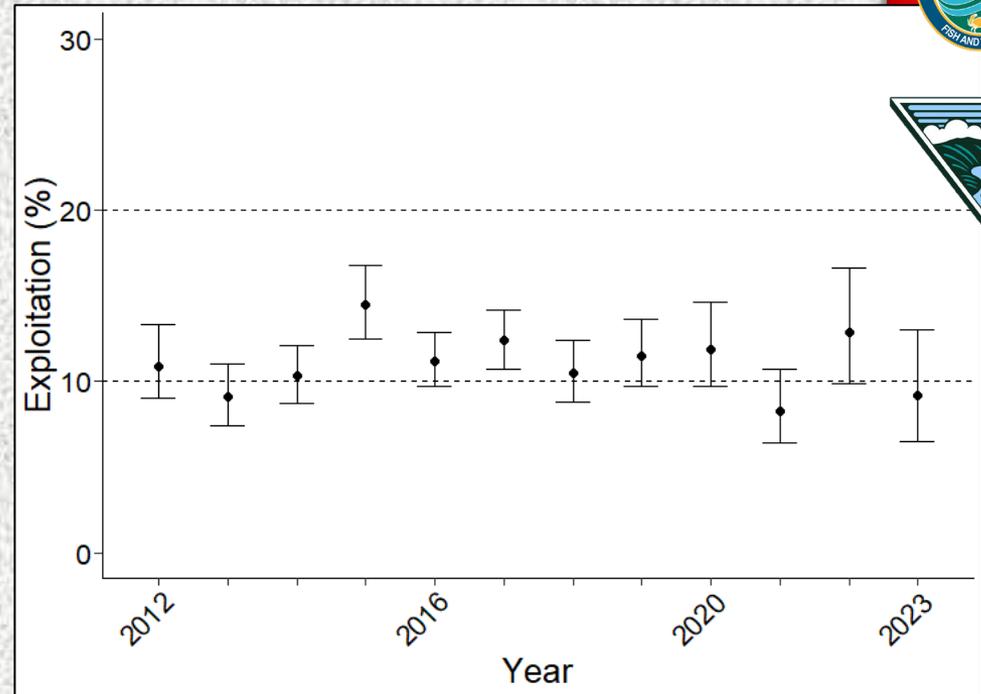
BME, mark/recovery models



Consider different recovery models



- More powerful software and advanced model
- Potentially improve the estimate
- Preliminary assessment is positive
 - More to follow...

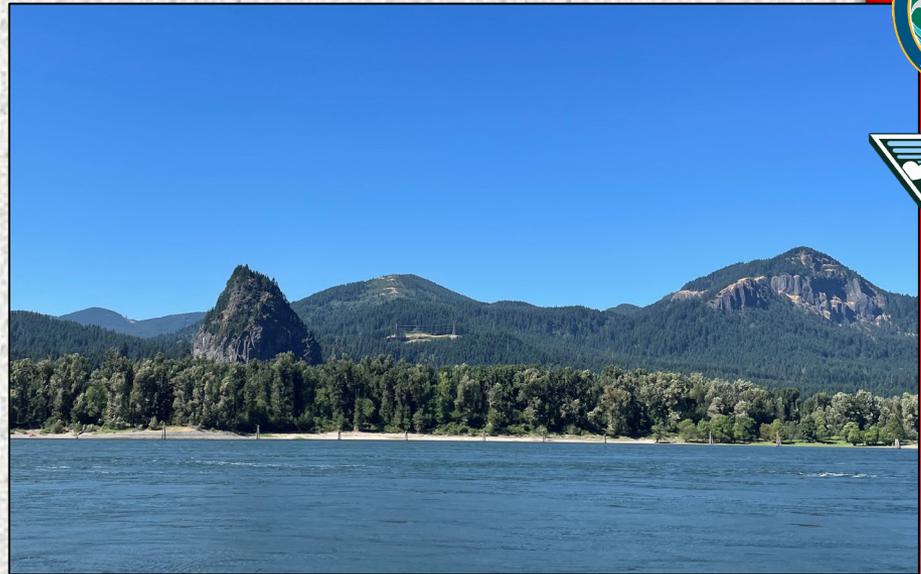


BME, Abundance



Is abundance relevant to other metrics?

- Additional field studies
 - Increase sample size
 - Increase sample frequency
- Conducted analyses to compare abundance to other metrics
 - Sport Reward
 - Population estimate

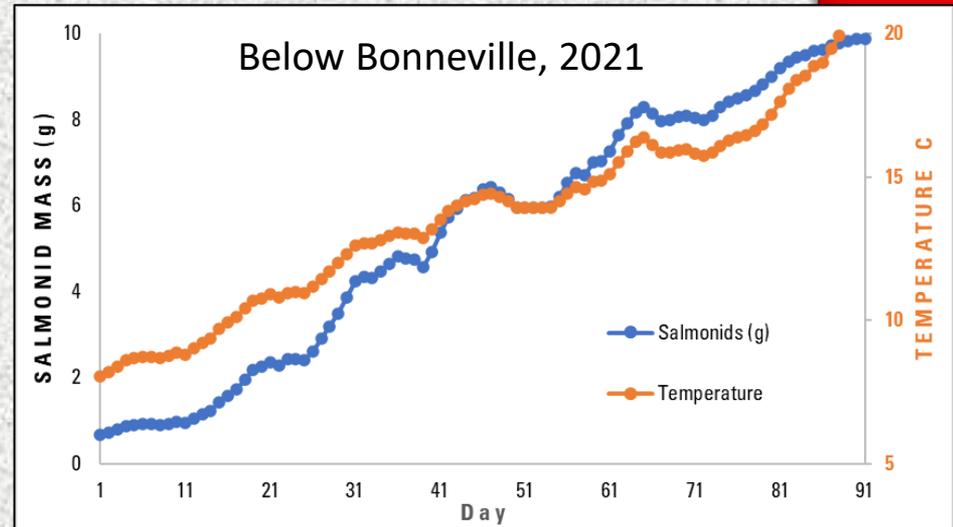


BME, Bioenergetics



Can fish energy budgets be used to model consumption?

- Assessed a new tool and model
 - Modeled energy budgets for Northern Pikeminnow and Walleye
- Results are promising
- May compliment the existing approach to assess predation in a dynamic river environment

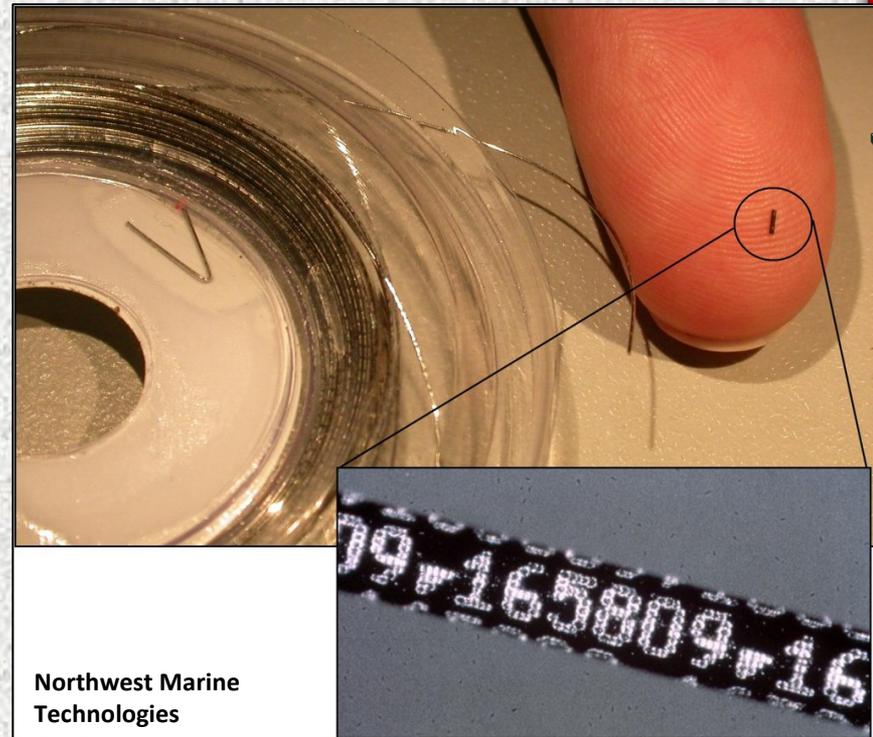


BME, Avian Predation Models



Can avian predation models be adapted for fish predation?

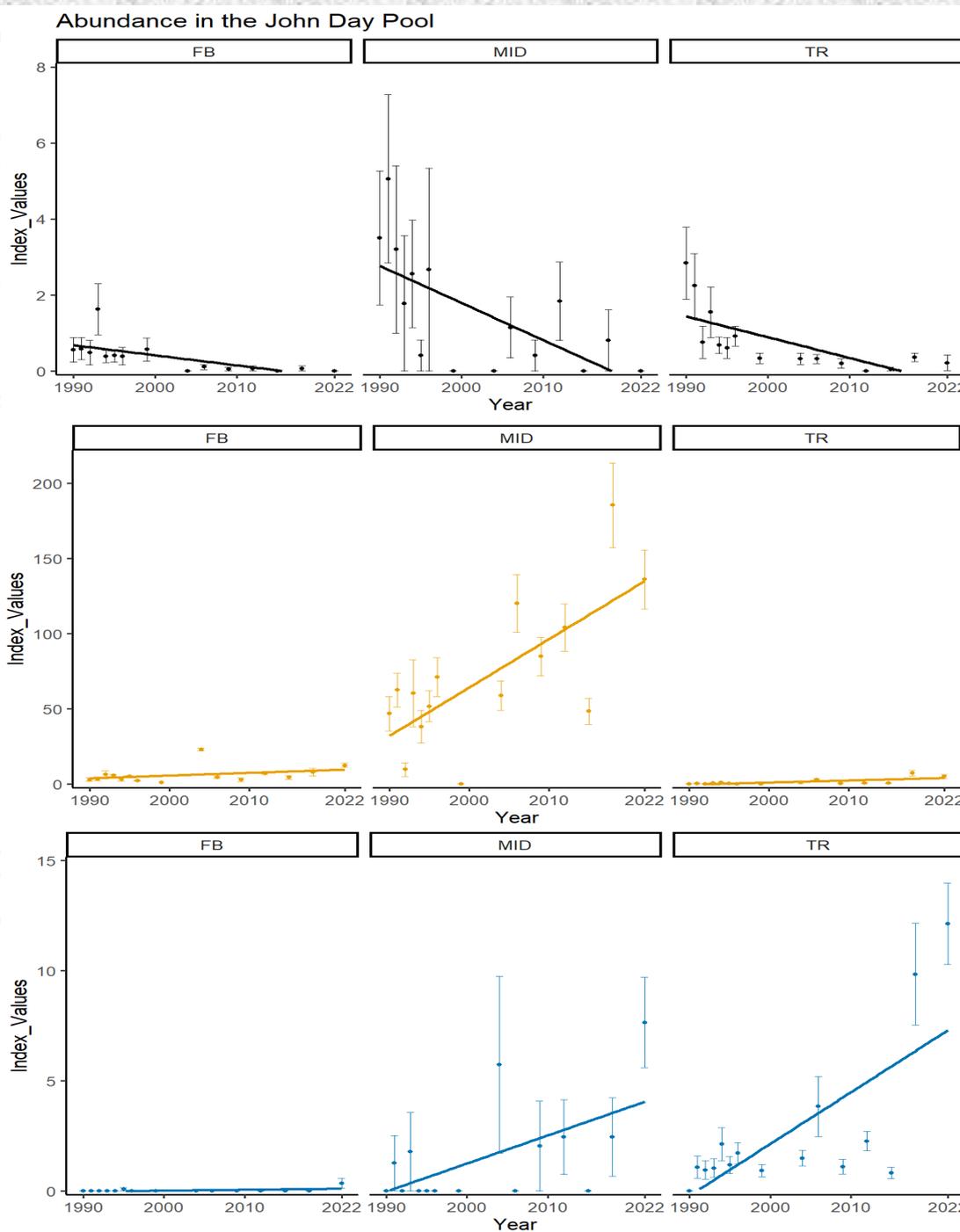
- Not at this time
- Re-considered tag information available from consumed salmonids
- Piloting studies to collect consumed Coded Wire Tagged salmonids



BM



- Comple
- NPMP
- regional
- 2022: I
- monito
- Reserv
- Sig



on

ed scales



Biological Monitoring and Evaluation

NOAA BiOp

- Asked to further reduce interactions with salmonids, particularly juveniles
- Existing measures:
 - Leaving an area
 - Not electrofishing when water temperatures $> 18^{\circ}\text{C}$
 - Adhering to NOAA guidelines for electrofishing
- Recent electrofishing changes:
 - Initiating our marking efforts two weeks early (2022)
 - Testing alternative gear (2022, 2023)
 - Reducing marking efforts (2023, 2024)



Acknowledgements

- BPA for continued support
- Cooperators
- Recreational anglers
- ISRP
- Dedicated staff

