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June 4, 2019

MEMORANDUM

TO: Council Members

FROM: Laura Robinson

SUBJECT: Presentation on Northern Pike economics report

BACKGROUND:

Presenter: Dr. David Kling, Economics Assistant Professor, Oregon State University
Dr. Jim Sanchirico, Environmental Science & Policy Professor, UC Davis
Dr. Bill Jaeger, ISAB Member

Summary: At the June Council meeting, Council-contracted economist Dr. Kling, ISAB ad hoc member Dr. Sanchirico, and ISAB member Dr. Jaeger will provide a presentation on their report of the economic impacts of Northern Pike in the Columbia River Basin. The report will be completed, distributed to Council members, and posted on the Council's website on June 10.

In the request letter to the ISAB and the economists, the Council asked two economics-related questions:

1. What information is needed to assess the economic impacts to natural resources in the Basin should Northern Pike spread throughout the anadromous and non-anadromous zones? If such information exists, can you estimate the economic impacts of the spread of Northern Pike?
2. For the related ISAB question regarding level of Northern Pike suppression needed (question 5, above), can you calculate the costs associated with that?

For context, question 5 to the ISAB was:

In consideration of ISRP 2018-3 regarding Northern Pike, do we know what level of suppression (exploitation) through gill net removal, angler removal or other methods is needed to reduce the population in Lake Roosevelt to a level sufficient to reduce risk of emigration from the lake or risk to other focal management species?

Response to Question 1

The economists found that estimating the economic costs of Northern Pike throughout the Columbia River Basin would require a large-scale, ecological-economic modeling exercise, which is beyond the scope of the current economics report. They also found multiple critical knowledge (data and model) gaps that need to be addressed before such estimations are feasible. The report will discuss an array of data collection and economic and ecological modeling that would be necessary to predict the range of possible medium- and long-run costs of an expanded Northern Pike invasions. The main points from the review in response to the first question are:

- Estimating the impacts of an expanded Northern Pike invasion requires predicting or projecting the outcome of spatial and dynamic ecological interactions among species once Northern Pike spread to the anadromous and currently uninvaded non-anadromous zones of the Basin. The necessary predictive multiple species models tailored to the relevant portions of the Basin and the likely time scales involved are not currently available.
- Parallel to (and integrated with) the ecological research required, a social science research effort will be required to complete a model of the socioeconomic effects, responses, and costs arising from an expanded Northern Pike invasion.
- Some important information is available now (e.g., the cost of increasing hydrosystem spill that may potentially be used to compensate for an increase in predation on native species of concern).

Response to Question 2

The ISAB completed their report, [A Review of Predation Impacts and Management Effectiveness for the Columbia River Basin](#), and [presented](#) it at the full Council meeting in April. In response to the ISAB's question 5, the ISAB stated that it is likely that with the best efforts in public education, early detection, and control or eradication, pike will eventually invade the anadromous zone. "There is no simple estimable relationship between abundance and the probability of emigration from Lake Roosevelt because, for example, each individual female pike produces tens of thousands of eggs so emigration by even one male and one female pike could produce thousands of juveniles. Moreover, evidence indicates that about as many invasions have been caused by illegal stocking, often to distant locations, as by dispersal of pike themselves."

Given that the ISAB was unable to provide the necessary quantitative targets requested by the Council related to reducing risk of emigration of Northern Pike, the economists approached the second economic question by addressing the risks to other focal management species in Lake Roosevelt, and describing the information needed to produce a cost estimate that meets best practices for economic analysis:

- Some costs may be drawn from current Lake Roosevelt suppression planning, while others may be inferred from Northern Pike control programs in other regions. However, these are not enough to reliably estimate expected costs of long-term suppression in Lake Roosevelt.
- Model-based estimates of the Northern Pike spatial distribution below which net predation on species of concern in Lake Roosevelt reaches an acceptable level are required.
- Monitoring and research are likely to remain components of a well-planned Northern Pike suppression in Lake Roosevelt. Both activities should be accounted for in a future cost estimate.

Relevance: 2014 Fish and Wildlife Program emerging priority #3: *preserve program effectiveness by supporting expanded management of predators and aggressively addressing non-native and invasive species.*

Workplan: Fish and Wildlife Division March 2019 Workplan item: predation science and economic review.

Background: At the January meeting, the Council approved Dr. Kling and Dr. Sanchirico to work alongside the ISAB on the ISAB's Predation Impacts Report for an associated economics review of the impact of Northern Pike in the Basin. Several agencies provided letters expressing their support of this work (see links below).

More Info:

[January Council Meeting Decision Memo](#)

[Council request](#) to the ISAB and economists

Regional letters of support for the economics review:

- [Pacific Northwest Economic Region \(PNWER\)](#) – September 2018
- [Washington Recreation and Conservation Office](#) – October 2018
- [Oregon Invasive Species Council](#) – November 2018

[Council decision memo](#) – November 2018

[Fish and Wildlife Committee memo](#) – September 2018