

# **eDNA Findings Report Review**

**Jason Walter – ISAG Co-Chair**

**Identifying distribution boundaries at the upper extent of fish in streams using environmental DNA**

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**DRAFT answers to CMER's Six Questions for the pilot report -  
Identifying Distribution Boundaries at the Upper Extent  
of Fish in Streams Using Environmental DNA**

**May 19, 2021**

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**Questions 1 & 2 – Does the study inform a rule, numeric target, performance target, resource objective, the FP rules, the FPBM guidelines, and/or Schedule L-1 or L-2?**

- No, not directly. This effort was designed to contribute information to a larger study yet to be scoped by CMER.**
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**Question 3 – Was the study carried out pursuant to CMER scientific protocols (i.e., study design, peer review, etc.)?**

- No. This study was approved by Policy and the FPB as a cooperative cost-sharing venture with the PNWRS.**

# eDNA Findings Report Review

**These points were further reinforced by the memo that the AMPA submitted to Policy on June 10, 2021.**

This is an exploratory study opportunistically pursued under a cost share agreement with the USFS Pacific Northwest Research Station to add sites from Washington to an eDNA study being conducted in Oregon. The Washington sites were chosen to test the eDNA sampling methodology where electrofishing survey work had been previously scheduled by industrial landowners.

The reason for joining the USFS and industrial landowners in this study, was primarily to evaluate the use of the methods to evaluate in general how eDNA sampling can contribute to the demarcation of fish- and non-fish-habitat, and to inform CMER on how to best incorporate eDNA sampling in future studies (e.g., PHB validation, Default Physical Habitat).

As an opportunistic exploratory study, neither the methods nor the final report were submitted to our Independent Peer Review process. The final report was conducted by the Principal Investigator and reviewed and approved by CMER.

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## Question 4A – What does the study tell us?

- **Even exploratory studies within CMER need to be administered with more oversight and accountability for deliverables to fulfill the needs of the AMP.**
- **Variability exists in when/where positive trout eDNA detections align with confirmed trout presence through e-fishing, but the reasons for that variability are not clear.**
- **The occurrence of trout eDNA is increased in field samples with greater e-fishing trout density.**

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## Question 4A – What does the study tell us?

- **Table 3 from the report (below) provides a direct comparison of eDNA versus e-fishing approaches...**

Metric	eDNA	Electrofishing
Assesses potential presence and absence of fish	Yes	Yes
Estimates relative abundance of fish	Yes	Yes
Archives fish as museum voucher	No	Yes
Obtains data on length, weight, or fish characteristics	No	Yes
Obtains genetic data	Yes	Yes
Allows for sampling year-round	with safe access	in wadeable waters
Can directly harm fish	No	Yes
Need state/federal scientific take permit	No	Yes
Offers data instantaneously	No	Yes
Identifies exact time and place of fish	No	Yes
Potential for false positives	Yes	No
Potential for false negatives	Yes	Yes

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## Question 4B – What does the study not tell us?

- About logistical practicality or ability to implement eDNA as a stand-alone water typing tool in stream.
- About the relative detectability (detection probability) of the specific eDNA and e-fishing protocols used.
- About how stream conditions and/or stream habitat factors may influence e-fishing detections.
- About the persistence of eDNA in the environment, nor does it provide information about how far trout eDNA may travel in a stream.
- And other things (see #4B in 'Six Questions' document)

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**Question 5 – What is the relationship between this study and others that may be planned, underway, or recently completed?**

- **See #5 in ‘Six Questions’ document for full details.**
- **Important next steps... Being discussed as a potential component of the PHB and/or DPC studies (study designs currently being developed in ISAG).**

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**Question 6 – What is the scientific basis that underlies the rule, numeric target, performance target, or resource objective that the study informs?**

- **This developmental study was not intended to and does not inform a rule, numeric target, performance target, or resource objective.**
- **The intent of this work was to assess a process/method, and to help inform if/how eDNA may be:**
  - 1. Further investigated in additional, broader scale eDNA research through CMER, and/or**
  - 2. Included as a component of other proposed CMER research (PHB, DPC, etc.)**



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**These points were further reinforced by the memo that the AMPA submitted to Policy on June 10, 2021.**

This study raised a number of concerns regarding the specific methods employed. Although identifying problems and process gaps is never ideal, in this situation they are consistent with the intention to use this effort and its challenges as lessons learned that can be applied in future CMER-developed studies. That said it was a heavy lift to for CMER to develop consensus responses to its six questions for Policy. This experience should be used in the future to temper the enthusiasm to which CMER contributes to work outside its process and control. Taking the time to understand more specifically the what, when, where, and how before committing AMP time and funding is time well spent.

Finally, it was not intended, nor is it appropriate, to use the results of this study to propose the Board take any formal action with regards to the established rules or Board Manual. CMER is expected to include eDNA methods in its future water typing related study efforts, and at that time will both apply the lessons learned from this endeavor and submit those study designs to more strenuous peer review.