



Application of Pacific Northwest fish passage lessons learned to expanding global opportunities.

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Downstream fish passage facility performance evaluation and monitoring...Does this thing work???



Thank You

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- **Nick Verretto:**  **PSE**
PUGET SOUND ENERGY

Feast and Famine from the Headwaters to the Sea

- Why Fish Passage?



Does This Think Work?

▪ **Silva et al. 2018:**

- Overall, there is a need for stronger rationales supporting targets and criteria for what constitutes “acceptable” fish passage performance
- Despite substantial literature on fish passage impacts at barriers and fishway designs, there are few objective targets or recommended performance criteria published.

▪ **Further Reading**

- NW Power and Conservation Council. 2016. Review of fish passage technologies at high-head dams.
- Silva et al. 2018. The future of fish passage science, engineering, and practice. *Fish and Fisheries* 19: 340-362
- Koch et al. 2019. Assessment of operational factors influencing performance of fish collectors in forebays in high-head dams. *Transactions of AFS* 148:464-479

Global Resource Demands

Population Growth + Environmental Factors and Resources

- Hydropower Development
- Water Supply
- By 2050, estimated that the world will require 70% more agricultural production, and by 2035, 50% more primary energy (Bruinsma 2009; de Fraiture et al. 2007)

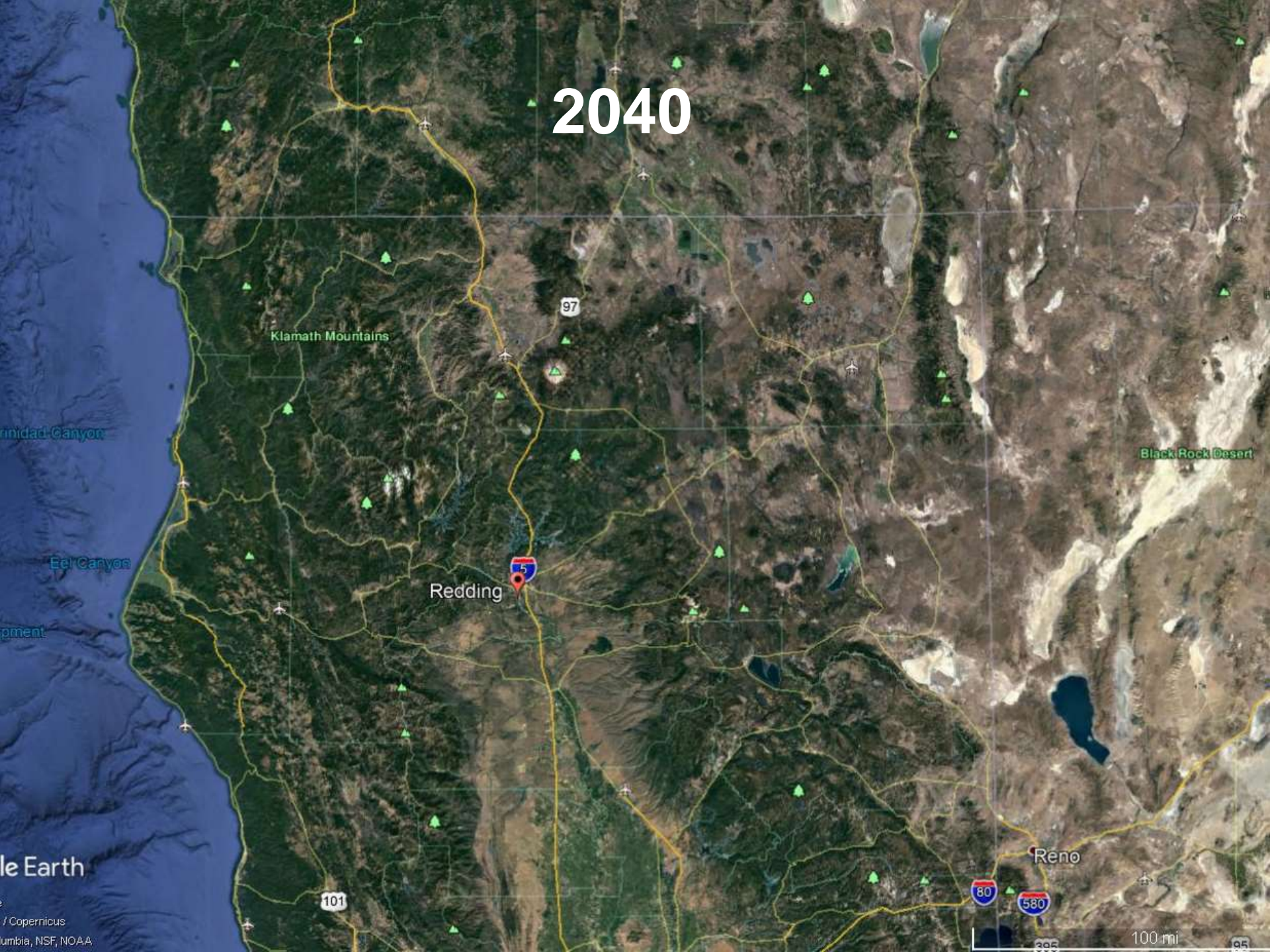


PNW

- Forefront of Fish Passage
- Reference for application of technologies.
- Key Concepts (NW Power and Conservation Council 2016)
 - Allow adequate time for evaluations and feasibility studies
 - Learn but do not compare
 - Understand and account for differences in site characteristics
 - Stay up to date with technologies
 - Collaborate with stakeholders
 - Consider developing a decision framework



2040



Trinidad Canyon

Eel Canyon

ment

le Earth

/ Copernicus
olumbia, NSF, NOAA

Black Rock Desert

Redding

Reno

100 mi

The Future...



Access To Habitat



Expectations for Performance

- Even in instances where foundational research has been performed and a suitable design implemented, the lack of a robust and ongoing monitoring program often precludes an effective determination of whether the implemented solution has achieved its goal of rehabilitating local fish communities. Such an approach is critical to underpin effective dissemination of fish passage technology to other sites and locations. (Silva et al. 2018)



Does this thing work?

- Lessons learned
- Critical to the success and to achieve goals for other locations and populations



HDR