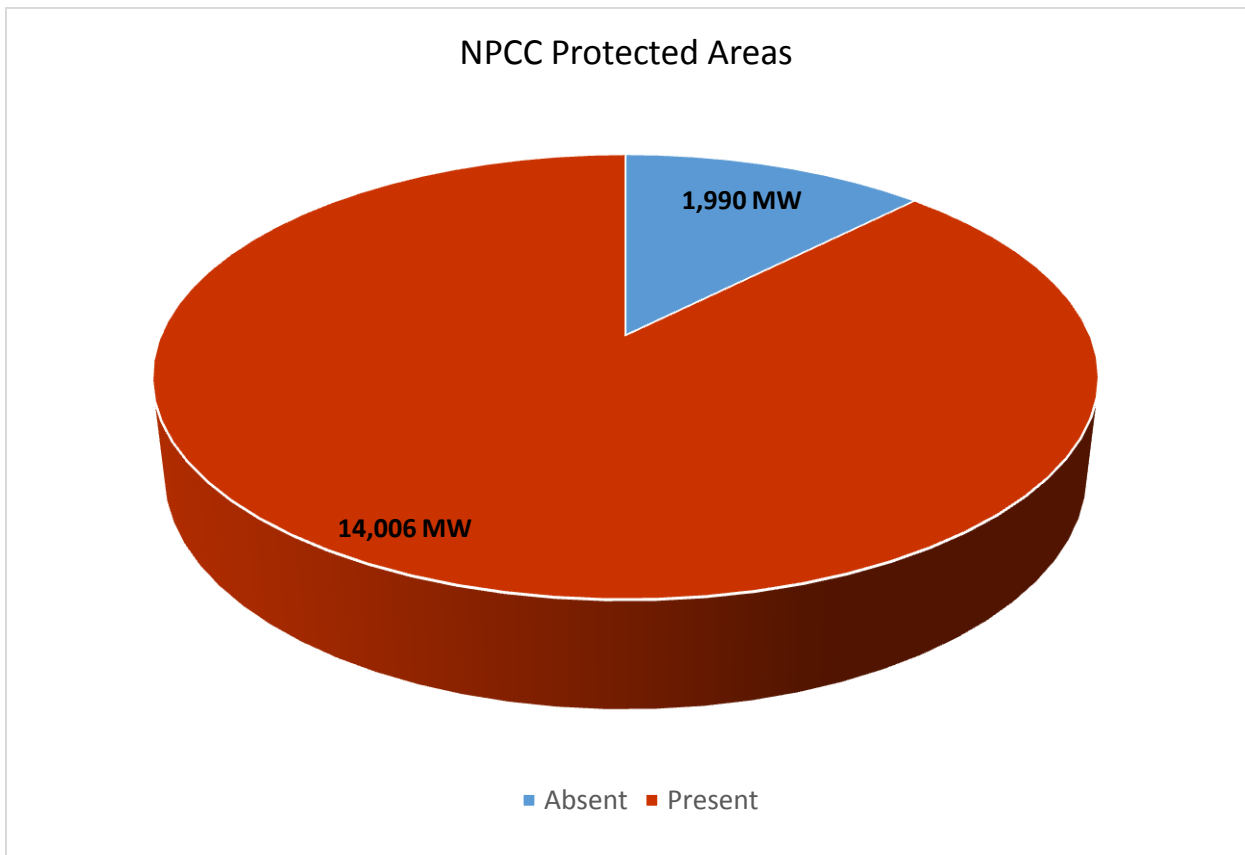


**Northwest Power and Conservation Council  
Protected Areas Designations, Fish and Wildlife Program**

There are hydropower projects identified in the studies that can be developed at existing diversions and therefore have a less significant impact on the region’s rivers and streams, as is also the case with the relicensing of existing hydropower projects or the addition of equipment or efficiency measures providing additional generation at an existing facility. Projects that require a new diversion from a river or stream are subject to the “protected areas” stream reach designations of the Northwest Power and Conservation Council’s Fish and Wildlife Program. This is important as a large number of Northwest streams are identified in the program because of regional commitments to fish and wildlife resources and environmental benefits as identified in Figure 1.

Figure 1 represents the results in capacity identified for the Pacific Northwest Region (Region 17) from the 2014 US Department of Energy Study (E-1 from Chapter 5) as related to the Council’s protected areas designations.



The chart in Figure 1 shows that for the stream reaches and capacity identified in the study for projects that are 1 MW or greater

- 14,006 MW or 88% of the total potential identified in the study fall into the “protected areas” designation; and

- 1,990 MW or 12 % of the total potential identified is outside designated “protected areas.”

There is not a similar data source for the projects under 1 MW which are defined to be 9,228 MW capacity. One might expect a similar proportionate number. However some of the smaller projects could be higher in the river or stream section above fishery or other protection areas so there could be some variance.

The US DOE study identifies the Pacific Northwest as having the greatest amount of new hydropower potential in the nation, but given the protected areas designations, that potential will likely not be recognized as 88% of it could be considered off limits for development under the Council’s Fish and Wildlife Plan.

Hydropower projects that require new diversions from a river or stream within protected areas, as of the new October 2014 measures<sup>1</sup> for the Council’s Fish and Wildlife Program, now allow an exception process under which the Council may consider a project with a run-of-the-river project at a new diversion from the stream. That exception process was not available in the prior version of the program. The process allows for a “petition for an exception to the protected areas designation for proposed projects that will provide exceptional benefits to fish and wildlife.”

Figure 2 shows the potential new stream development within the protected areas status by category for projects of 1 MW or greater from the US DOE study.

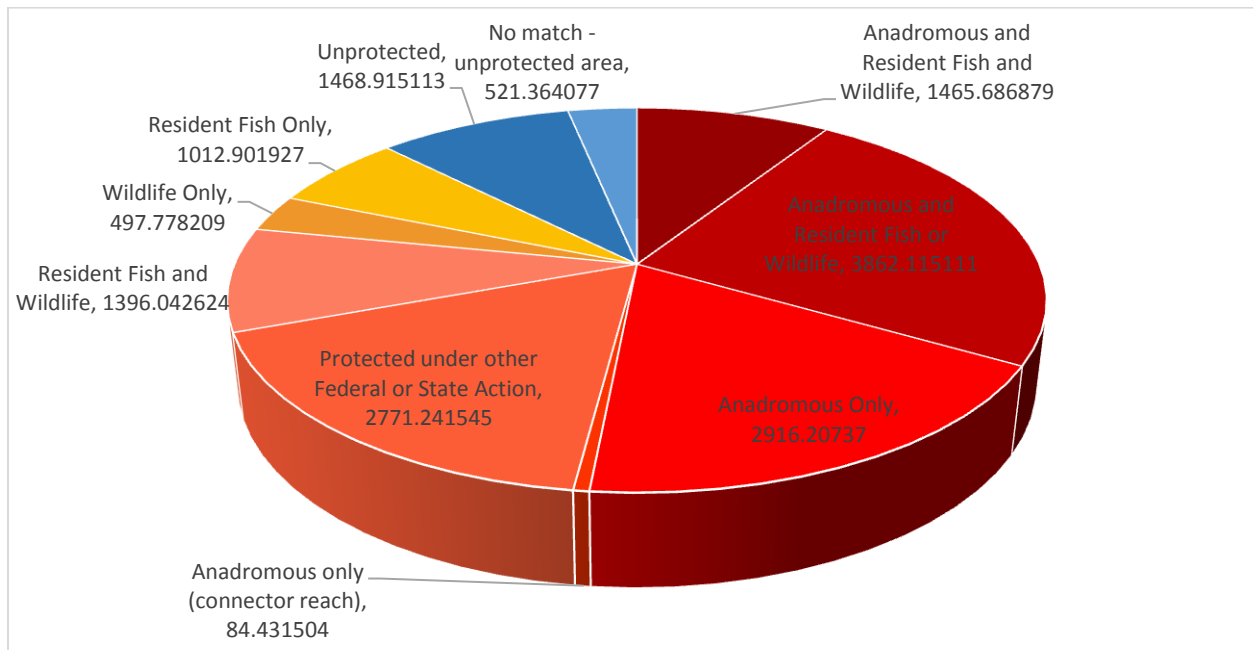


Figure 2. Potential New Stream Development by NPCC Protected Areas Status

<sup>1</sup> Columbia River Basin Fish and Wildlife Program, Pre-publication version 2014, pages 169-170: <https://www.nwcouncil.org/fw/program/2014-12/>

To analyze the amount of capacity from this study that falls into the protected areas designations, the Northwest Hydroelectric Association, as contractor, worked with the Pacific States Marine Fisheries Commission and the Oak Ridge National Laboratory to overlay the US DOE map over the region's protected areas designations to match where run-of-the-river hydroelectric projects may not be able to be developed within a protected areas designation.

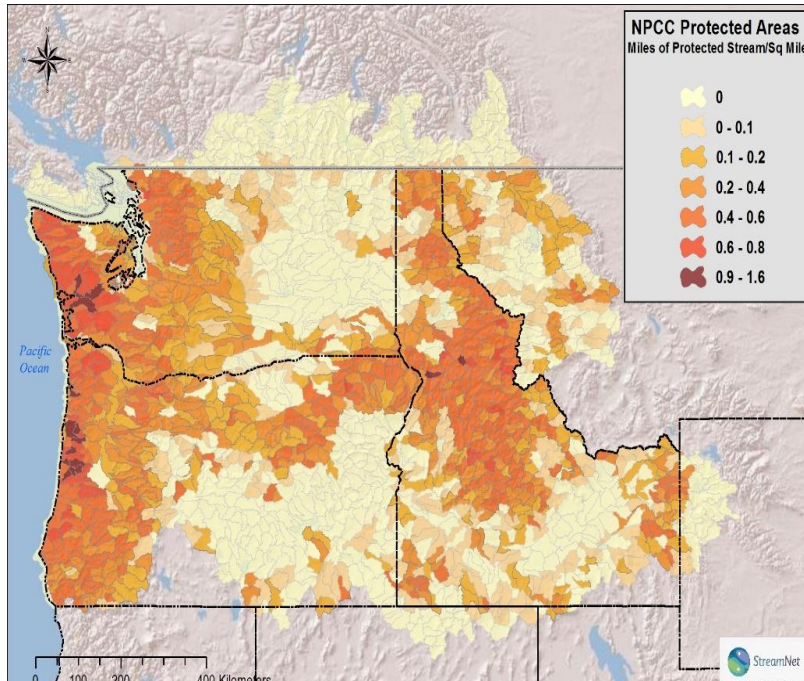


Figure 3 represents the Northwest Power and Conservation Council's Protected Areas dataset designates stream reaches that warrant protection from hydropower development. The above map illustrates the relative density of protected stream segments in the Pacific Northwest by normalizing the miles of NPCC protected streams by watershed area (miles/square mile).

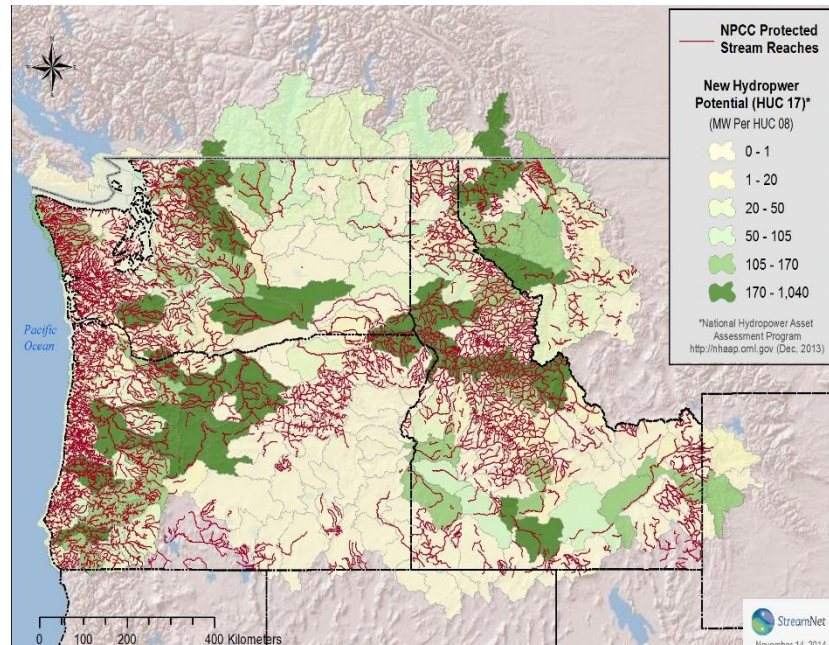


Figure 4. The Northwest Power and Conservation Council's Protected stream reaches are overlaid on a map layer that summarizes the new hydropower potential (MW) that exists in the Pacific Northwest (Hydrologic Region 17) at the HUC08 level (4th level HUC) for projects 1 MW >. The hydropower potential data presented are based on a study conducted by the National Hydropower Asset Assessment Program (Kao, S. et. al, 2014).

Special thanks to:

- Van C. Hare, GIS Manager, Pacific State Marine Fisheries Commission who provided the charts and maps in this addendum; and to
- Nicole Samu, Geospatial Data Coordinator, Energy-Water Resources Systems Group, ESD, Oak Ridge Laboratory who worked with Van to provide base data to allows the overlay onto the study defined stream reaches.