



Memo

To: NW Hydro Association
From: Dick Wanderscheid, Angus Duncan and Todd Reeve
Re: The Bonneville Environmental Foundation's comments on the draft hydro potential study

BEF staff completed an extensive review of the report. However, we wish to clarify that **we did not review any of the source data used to create the calculations presented in the report.** As a result, our comments serve only to address the larger, conceptual picture of the hydro potential in the region. In particular, we attempted to provide perspective with respect to possible conflicts with watershed, fisheries, and environmental concerns.

BEF acknowledges the usefulness of the multiple studies referenced in the report, which we agree demonstrate a modest but not insignificant quantity of new hydroelectric resource — mostly as distributed generation — available to the PNW and that should be reflected in the 7th Power Plan. We are convinced that many projects can be developed in an environmentally sensitive manner that will create green electricity, improved watersheds, better fish passage, increased water quality and quantity and climate benefits.

However, BEF needs to express a reservation with the implicit premise that new projects need only avoid protected areas to be presumed environmentally acceptable. In fact, most streams in the PNW, in and out of protected areas, are water-quality and quantity constrained. Interacting characteristics of low flows and excessively high temperatures should be considered limiting conditions wherever stream biota may be at risk, or where such at-risk biota are downstream of a potential project near enough that it could create additional stress through water diversion, even if the diversion is temporary and the flows are returned to the stream eventdownstream of the at-risk biota.

but downstream of the at risk biota.

There can also be problems assuming that any existing irrigation water diversion would create no ecological impact if it were converted to hydro. We think it is useful to acknowledge that there are many aging dams/diversions that are not up to current fish passage standards. Many diversions do have significant ecological impacts and would not be permitted in their current form under current day standards. Thus, we think it would be a mistake to conclude that all existing diversions are "low/no impact." We believe an important provision would be to identify (or include in a review process) an effort to a) assess environmental impact of existing diversions; b) assess ecological/social value of existing diversions; and c) assess if ecological passage improvements can occur in concert with hydro development (where beneficial). Ideally, we should set up a process where the region can support a new wave of hydro-electric projects installed on diversions that a) create societal/economic value and/or b) have no significant environmental impact.

It may also be worth noting that there are many old water rights and diversions that have not been in service for many years (often because the rights are of low seniority and are seldom met). Many of these PODs and rights are/may be subject to forfeiture/removal because of non-use issues and would not be good candidates for hydro development.

The report does not speak to the fact that adding a power generation right (to a current irrigation right) provides canal/irrigation companies with an incentive to divert as much water as possible (within their right). In many cases, this may result in diverters increasing the amount of water they withdraw from streams. For example, many diverters do not withdraw their full water right early or late in the irrigation season (when water is not needed because soil moisture is high and ET is low). Installing hydro generation may provide an incentive for diverters to always divert a full amount of water regardless of irrigation needs. This could produce negative impacts for fish and wildlife. Consultation with fish and wildlife agencies would be needed to assure that newly approved hydro generation rights do not promote increased water withdrawals and/or associated negative impacts to streams and biota.

Although there are possible negative impacts associated with increased hydro development, studies (Cumulative Watershed Impacts of Small-Scale Hydroelectric Projects in Irrigation Delivery Systems - 2013 by Farmers

Conservation Alliance) also show that in a comparison of irrigation districts with and without hydro generation, the districts with hydro generation were able to invest more funding in system upgrades and fish passage improvements. This finding underscores the point that hydro development in collaboration with irrigation systems appears to have the potential to a) increase water use efficiency and improve food and water security; b) augment depleted stream flows; and c) enhance fish passage conditions. Thus, in-conduit hydro has the potential (when done right) to improve ecological conditions, and any effort to scale up hydro development in the region should seek to leverage these co-benefits wherever possible. The report does not appear to highlight this need and opportunity.

Therefore, BEF believes it possible to design hydro generation that, in combination with other project design and operational features, can result in improving in-stream conditions for at-risk biota; planners and utilities should prioritize such projects. For example, converting open ditch irrigation to piped irrigation can significantly reduce water losses resulting from seepage and evaporation. Designing a piping system to use in-pipe generating units (sometimes in place of pressure reducer equipment) can free up additional flows that water rights holders can choose to return to in-stream use. Such arrangements are not unknown in the region, and should be emulated. A test — or prioritization factor — of *improved* stream and water quality once a project is completed and operating would be a useful way to further distinguish new hydroelectric projects that the region should be encouraging, potentially through access to funding, priority access to transmissions and services, or other incentives.

Accessing the untapped hydro resource in the region will in many cases require both private initiative on the part of irrigators, water rights holders, and developers, and the cooperation of (mostly rural) utilities to find ways to integrate the output into their own load-service or transmit it to loads that can make use of it. BPA, because it is interconnected with many of the utilities whose service territories contain hydro resources, will also need to find innovative means to ensure that resources can find buyers and serve loads. Calculating the value added by the hydro system (e.g., negative line losses when the resource displaces BPA deliveries; voltage support; etc.) and incorporating it to project economics will be important. Sending signals to potential project developers about where on the system such resources may add the greatest value will be useful to foster successful hydro development.

Hydro also has the added value of being a somewhat dispatchable resource,

and it produces no greenhouse gas emissions. As climate and carbon regulations become more widespread and restrictive, the cost effectiveness of carbon-free resources will become more significant. While relying on natural gas seems prudent in the short run, when looking forward to a carbon constrained future, renewables might make for a wiser longer term choice. Any future planning needs to address this carbon cost risk as a part of the planning process.

Conclusion

BEF believes there can be an increased role for hydro in the region's energy future and projects that are done correctly can provide energy, economic, environmental and climate benefits. Having first hand knowledge of a handful of successful projects that demonstrate these benefits, we are encouraged that they can be replicated in other places in the region. Supporting and publicizing these successful projects can encourage other project developers to successfully implement other projects where they make sense.

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