

## Chris Pinney

Prior to my retirement I served as a Federal agency Fishery Biologist for the Columbia and Snake river ESA-listed salmon life stage survivals through the hydrosystem, who had direct RM&E design and performance responsibilities for reservoir drawdown experiments, dam breach and return-to-natural river designs and evaluations and scientific/biological justifications, Dissolved Gas Abatement Studies and the spill program's hydraulic and TDG effects on passing salmon and steelhead, as well as water temperature effects on salmon and steelhead life stage survivals including designs to band-aid and emergency action localized and reach specific impact zones with passage temperatures through operational modifications of the spillways and adult ladders.

The regional coordinators for fish operations in the mid- and late-1990s were lead to believe that the spill up to 120% TDG supersaturation waiver from the 110% TDG standard was to be a short-term or 'temporary' modification. Idaho DEQ and the Nez Perce Tribe did not flow with the Snake River arguments by maintaining the 110% standard in the Clearwater River, principally for ecological reasons of disrupting foodweb constituents required for salmon and resident species productivity. After 25 years, where is Ecology on this larger original baseline ruling? Similar to elevated water temperature effects systemwide, it is time to rectify and settle this forgotten rule.

I hesitantly applaud Ecology on their cautious recommendation for maintaining 120% TDG standard in tailwaters, at least for 2019. SAR estimates are informative, but limited due to their complex derivation of most influential causation. FPC and others need to address the reach and systemwide juvenile survivals while incorporating all dam (project) specific survivals for those variations in flow years for which studies are available. My experience and 2018 spill operation (which did not achieve the desired low end PITPH because flows required high powerhouse operation) study indicates that spill up to, but not exceeding 125% TDG with minimal PITPH I support the DEIS Alternative 1, and better yet, Ecology taking a more active leadership role for the states of Washington and Oregon in regional salmon and steelhead survival and recovery management forums for wild stock production management by avoiding enhanced ecosystem impacts of any elevated %TDG >110% supersaturation (especially systemwide) by your serious consideration of an Alternative 4 for both water temperature and gas supersaturation regulation in a most haste return to natural river function with re-connection of the channel flow to its subsurface flowing water bodies (water table, hyporheic base flow, spring, aquifer, etc) on as wide of continuum footprints as permanent or seasonally possible.

I am an independent (retired) fish ecologist (scientist, aka Subject Matter Expert termed by Federal entities) now, upon retirement, so feel free to contact me for any clarifications.

Thank you for the opportunity to comment technically, and again for your recommended adherence in "short-term" hopefully for not exceeding 120% TDG standard.