



## FISH PASSAGE CENTER

1827 NE 44<sup>th</sup> Ave., Suite 240, Portland, OR 97213

Phone: (503) 230-4099 Fax: (503) 230-7559

<http://www.fpc.org/>

e-mail us at [fpcstaff@fpc.org](mailto:fpcstaff@fpc.org)

### MEMORANDUM

TO: Andrew Kolosseus, Washington Department of Ecology  
Agnes Lut, Oregon Department of Ecology

*Michele DeHart*

FROM: Michele DeHart

DATE: June 19, 2008

RE: Response to COE's comments on GBT Presentation by the Fish Passage Center

The Fish Passage Center (FPC) was requested by Washington Department of Ecology and the Oregon Department of Environmental Quality to summarize and present the data from the Gas Bubble Trauma Monitoring Program. That presentation was given to the Adaptive Management Team on May 13, 2008.

[http://www.ecy.wa.gov/programs/wq/tmdl/columbia\\_rvr/051308mtg/AMT051308FishPsgPresent.pdf](http://www.ecy.wa.gov/programs/wq/tmdl/columbia_rvr/051308mtg/AMT051308FishPsgPresent.pdf)

The US Army Corps of Engineers provided comments on that presentation in a memo dated June 2, 2008. In that memo the COE states "*The Fish Passage Center (FPC) gave a presentation at the May 13, 2008 Adaptive Management Team (AMT) meeting in which they promoted the idea that the TDG levels in the project tailwater at the next project upstream were high but resulted in low incidences of Gas Bubble Trauma (GBT) in juvenile salmon and steelhead.*" The FPC does not "promote ideas". The FPC analyzed the available data and presented the technical information and results. We regret that the COE misinterpreted the presentation that was given by the Fish Passage Center.

The Gas Bubble Trauma Monitoring Program data was summarized for 1996 to the present. The FPC presentation includes a table (slide #5) that shows the highest daily percentage of GBT detected in a population (with sample size > 95 fish) during a given year in that time period.

This slide demonstrates the variability in GBT among years, primarily due to the variation in environmental conditions (flow, spill) among years. The COE contends that the information presented by the FPC “*is not consistent with other FPC data*”. This is not true. The table clearly shows that for 2007 a high incidence of GBT was detected in steelhead late in the season, when TDG was less than 120% and fish were taking an average of two months to migrate between projects. This migration typically only takes a few days during the middle portion of the season, when flows are higher. This occurrence of GBT in steelhead in 2007 was a unique situation reflecting the low flows that were occurring late in the migration, which caused an extended period of exposure, as well as the physiological state of late migrating steelhead that tend to residualize and remain in fresh water rather than migrating through the system.

The COE appears particularly confused regarding the compilation of the data collected since 1996 that the FPC presented (slide #6). The COE states “*The presentation included a figure showing these data combined among years and project to assert that elevated tailwater TDG levels at upstream projects resulted in minimal incidences of GBT*”. The COE has misinterpreted the figure presented. For the graph the FPC developed, all fish collected with signs of GBT since 1995 were plotted against the prevailing tailrace TDG levels when they passed through the tailrace. This was not an analysis of length of exposure as the COE misconstrues. The graph simply shows that fish have been detected (including the 2007 data) over a range of TDG levels from 100% up to TDG levels greater than 130%. The upstream TDG levels were used to describe the existing conditions to gauge what would be our expectation of incidence of GBT in the population if the forebay monitor was removed as a point of compliance. The conclusion was based on the technical information reviewed. Both the incidence and severity of GBT increase with increasing TDG. Below tailrace TDG readings of 120%, few fish are detected with signs of GBT. We stand by the technical conclusions presented.