

# Memorandum

May 22, 2017

To: John Palmer, USEPA

From: Peter Leinenbach, USEPA

Subject: Estimated CWR volume for the Wind River and Little White Salmon River/Drano Lake

The confluence zones of the Little White Salmon/Columbia River and the Wind/Columbia River were monitored for stream temperatures on August 15<sup>th</sup> and 17<sup>th</sup> 2016, respectively (**Figures 1 and 2**). Measured Columbia River temperatures on the day of these sampling events was 21.1°C at the Wind River Confluence, and 21.5°C at the Little White Salmon River confluence. **Tables 1 and 2** illustrate the estimated plume volume that is 2°C colder than the Columbia River on the date of sampling for these respective rivers.

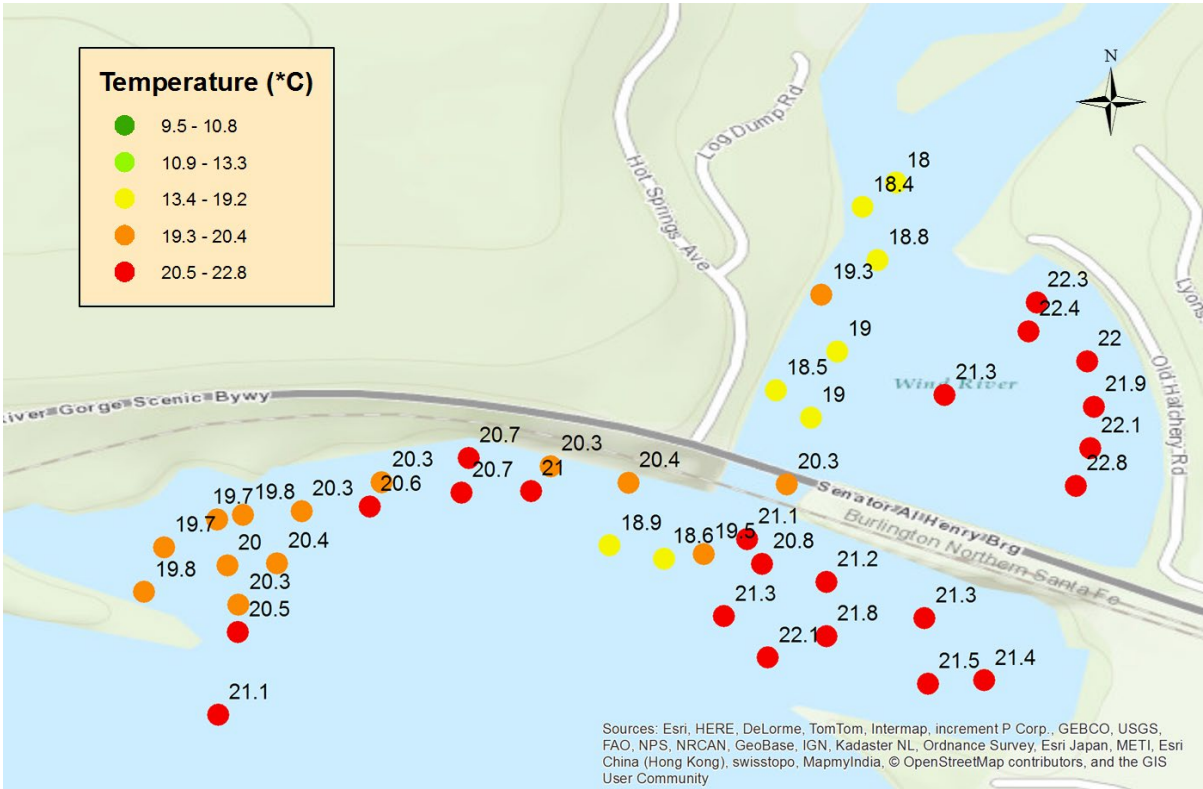
**Table 1. Cold Water Refugia Volume (m<sup>3</sup>) in the Wind River confluence plume with the Columbia River on August 15<sup>th</sup> 2017.**

Depth	More than 2°C cooler than the Columbia
0.5 m	3606
1.0 m	4222.5
1.5 m	4600
2.0 m	8617
2.5 m	13271.5
3.0 m	26483
<b>Sum</b>	<b>60,800</b>

**Table 2. Cold Water Refugia Volume (m<sup>3</sup>) in the Little White Salmon River confluence plume with the Columbia River on August 17<sup>th</sup> 2017.**

Depth	More than 2°C cooler than the Columbia
0.5 m	42620.5
1.0 m	18187.5
1.5 m	11765.5
2.0 m	13190.25
2.5 m	11735.5
3.0 m	23908.5
3.5 m	46073.5
4.0 m	7247.5
4.5 m	8697.5
5.0 m	99671
5.5 m	116609.5
6.0 m	126858.5
6.5 m	155893.5
7.0 m	140082
7.5 m	119929.5
8.0 m	93533.25
8.5 m	57883.2
9.0 m	3201.45
<b>Sum</b>	<b>1,097,088</b>

**Figure 1.** Water Temperature at a 1 meter depth at the Wind and Columbia River Confluence (8/15/16)



**Figure 2.** Measured Water Temperatures at a 1 meter depth in the Little White Salmon and Columbia River Confluence on August 17, 2016.

