Comments by Marsh Burch, Received 15 November 2022

* The study did not even begin to analyze the cumulative impacts and groundwater sustainability that NMFS discussed in its comment letter.

Response: The NMFS comment letter (dated September 4, 2019) was prior to the instigation of the Supplemental Groundwater and Surface Water Analysis for Kidder Creek Orchard Camp (Pearson, 2021). NMFS’s comments are mainly based on the USGS’s work on groundwater-surface water flow interactions as documented in USGS Circular 1376 (Barlow and Leake, 2012). Additionally, The Center for Law, Energy & the Environment, UC Berkeley School of Law in 2018 published “Navigating Groundwater-Surface Water Interactions under the Sustainable Groundwater Management Act” by Cantor et.al.. In this document under Section III: Picturing the Connection states “USGS Circular 1376 provides guidance on ways to model and quantify groundwater pumping-surface water flow interactions”. Cantor et.al. ,2018 is posted on Siskiyou Counties SGMA website as the resource document -<https://www.co.siskiyou.ca.us/sites/default/files/fileattachments/natural_resources/page/15292/sgma_fisheries_connection_2018_ggu.pdf> . Consistent with these documents Siskiyou County developed a Request For Proposal for the project impacts on the COHO pools, nearby domestic wells, and Scott River flows.

It was under the above umbrella that the Supplemental Groundwater and Surface Water Analysis for Kidder Creek Orchard Camp data collection, analysis, and documentation was conducted. The Report (Pearson, 2021) Provides 4 lines of evidence consistent with the guidance of spirit of the above documents. Additionally, each line of evidence stands on their own in support of the report’s findings. These 4 lines of evidence are:

**Documents & Data** – The USGS’ 1958 report to this day is the geologic and hydrogeologic basis for all previous studies and probably for future studies as well. The UC-Davis modeling work in the groundwater basin is another foundational study, even though the actual model grid did not continue west on Kidder Creek to cover the project area. Then there is USGS Circular 1376 (Barlow and Leake ,2012) that does not provide information about the Scott River groundwater basin, but it does establish the state-of-the-art framework for determining groundwater-surface water interaction. It needs to be noted that this report states that wells that are closer than 1,400 feet to a surface water source AND produce 700 gallons per minute or more are yellow flags and are the subject and examples used in the Circular. Then there are the Department of Water Resources land and water use data along with 38 Well Completion Reports and well documents from local landowners. Of these water well documents, there were 21 with sufficient location data that they could be located with relative certainty.

**Determination of basin characteristics –** Based on the above documents, maps and basin cross-sections were constructed of the surface and subsurface to determine the nature and extent of the groundwater system in the Kidder Creek area. These data collection and analysis efforts revealed that most of the work, to date, in the Scott Valley has focused on the mainstem of the Scott River and the hydrogeologic conditions in the vicinity of the mainstem of the Scott River. As is common in groundwater basins, not all basins are not uniform in character and there is usually variations within each basin. Previous studies recognized that the groundwater conditions along the margins of the basic are much different that the central part of the basin, but they did not do any extensive analysis. The analysis conducted for the Pearson report is the most extensive analysis to date of the available data for the upper Kidder Creek area.

**Develop water budget values –** A water budget helps determine where surface and ground water flows and is used as well as the interrelationships between the two water sources. Determining the impacts of water use and recharge of the three areas of concern mentioned in the beginning, it is imperative that the focus not be on the total amount of each type of water used but on the rate of flow in and out of the basin. For example, once the water in Kidder Creek flows past the Coho pools, those molecules of water never see the pools again until they arrive in storms coming from the Pacific Ocean. Based on the available data, there is about 180 gpm of groundwater flowing from the foothills, by the project area, towards the Scott River (part down Oro Fino valley and part east to the Scott River). That is why it is imperative that values of of rate of flow like gallons per minute (gpm) and cubic feet per second (cfs) are used to determine impacts. At highest water use (the 3 months during the Summer Camp period) the Project needs the existing well of 17 gpm (tested at 21gpm) and one more of at least 10 gpm to meet water needs of 26 gpm. Currently, the existing well isn’t creating any impacts on the 3 areas of interest. But to be very conservative, the analysis considered the impacts of the total 26 gpm given realizing that 9 months or 3/4s of the year, this high of a demand is not required.

The water budget analysis also shows most water use in a rural setting is for outside landscape watering, where the evapotranspiration of the plants consumptively removes water from the system. The camp uses surface water from the barker ditch for outside watering. Just as a side note, with the camp expansion, there will be less vegetation using water as hard surfaces (like roofs and walkways). Rain that falls on these hard surfaces will run-off and when reaching natural soil will quickly percolate into the groundwater supply. Therefore, removing vegetation and landscaping from the budget, there is only 10% of the extracted water that is consumptively used (i.e. evaporation from showers, spillage, etc.). Therefore, 90% of the water use goes literally down the drain into the septic system and percolates into the groundwater supply. This means that about 3-gpm of the 26-gpm extracted rate of groundwater flow is removed from the system.

Just for perspective’s sake, a 5/8- inch Garden hose will produce 9-17 gpm (12.5 avg). Therefore, the total groundwater use (at 26-gpm) is equivalent to about two garden hoses. About 1 garden hose is currently being used, so the camp expansion will only require the addition of 1 more garden hose. Given that about 180 gpm are flowing past the camp area, this one garden hose is insignificant as are two garden hoses. Another way of looking at the total groundwater use is that 26 gpm could irrigate about 4 acres of pasture with only 1.5 gpm percolating into the aquifer. Also, most domestic wells in the area produce about the same amount of water, but they have outside watering. Given this, based on a satellite imagery reconnaissance, they have less outside water use than the towns in the valley. And when you compare this on a per/acre basis, they appear to use even less water per acre.

**Drawdown Calculations -** Based on data from the documents, the UC-Davis modeling, pump tests reports, and Well Completion Reports, calculations were made using conservative values to obtain a worse case scenario. The amount of water extracted (of 26 gpm, not using the actual 3 gpm) did not impact the Coho pools, nearby domestic wells, or downstream groundwater and Scott River users. If the water extracted does not impact these 3 water sources, then it will not impact water sources miles away.

**Conclusions** - All 4 of these lines of evidence support a conclusion of no significant impacts on: 1) Coho pools, 2) Neighbor’s wells, and 3) Downstream groundwater and surface water users.

* The Study makes no mention of the fact that the central dining facility (likely to generate most of the domestic wastewater) “may require an alternative system.

Response: The water supply for the dining facility is part of the 26 gpm of maximum demand. The wastewater treatment mentioned in the FEIR is a pre-disposal treatment that will prepare the wastewater for disposal in a septic system, so the water does return to the aquifer system.

* The assumption that all the groundwater extracted at the camp will go into septic systems is incorrect.

Response: The report does not state that all the groundwater extracted will go into the septic system. About 3% of the water is consumptively used and lost to the water supply and 97% of the water goes into the septic system and the local groundwater supply.

* The Pearson Study failed to consider cumulative impacts and failed to consider how the season of extraction might alter impacts (particularly in light of the fact that the study assumes almost zero water consumption because of the septic systems).

Response: As mentioned above, the report analyses the maximum groundwater demand which also occurs during the dry season. Also, as stated above, even though most of the groundwater extracted is not consumptively used, the well drawdown calculations used the maximum demand use of 26 gpm. If this use level did not impact the Coho pools or the nearby domestic wells, the actual use will be much less. As pointed out above, we are dealing with rate of flow through not a removal from a stagnant pond. The Mack report and the USGS topographic map of that time shows that Kidder Creek would dry before reaching the Highway 3 bridge during the Summer. This documentation, as mentioned in Pearson’s report, establishes hydrologic and hydrogeologic conditions in the groundwater basin before most of the development of the groundwater resources or what is commonly known as “pre-development conditions”. The reason Kidder creek has historically gone dry is because the stream flow coming from the mountains is not sufficient to keep up with the percolation rate of the Kidder Creek bed.