

Sugar Creek and Sugar Creek Refugia Project
Water Temperature and Timing of Coho Salmon Embryonic Development
April 21, 2025

Scott River Watershed Council

Adult coho salmon were observed spawning in Sugar Creek and the Connection Channel of the Sugar Creek Refugia Project on November 25, 2024. The daily average water temperature (°C) at surface water temperature monitoring stations in the mainstem Sugar Creek, the Sugar Refugia Connection Channel and Sugar Refugia Pond 1 illustrates the significantly warmer temperatures in the groundwater influenced Sugar Refugia Project compared to Sugar Creek – Figure 1. The warmer temperatures in the Sugar Refugia project increase the Accumulated Thermal Units (ATUs) of the embryos in the Sugar Refugia Project resulting in accelerated embryonic development compared to mainstem Sugar Creek – Figure 2.

Analysis of the date of achievement of stages of embryonic development (eyed, hatch and fry emergence) in the Sugar Creek Refugia and mainstem Sugar Creek illustrates the significantly faster growth in the groundwater influenced habitat – Table 1. The eyed stage of embryonic development (220 ATUs) was achieved in twenty-five (25) and twenty-eight (28) days in the Sugar Refugia Pond 1 and Sugar Refugia Connection Channel sites, respectively, compared to seventy-four (74) days in the mainstem Sugar Creek – Table 2.

Two Young of the Year (YOY) coho salmon fry were observed in the Sugar Refugia Pond 2 on March 26, 2024 corroborating the analysis.

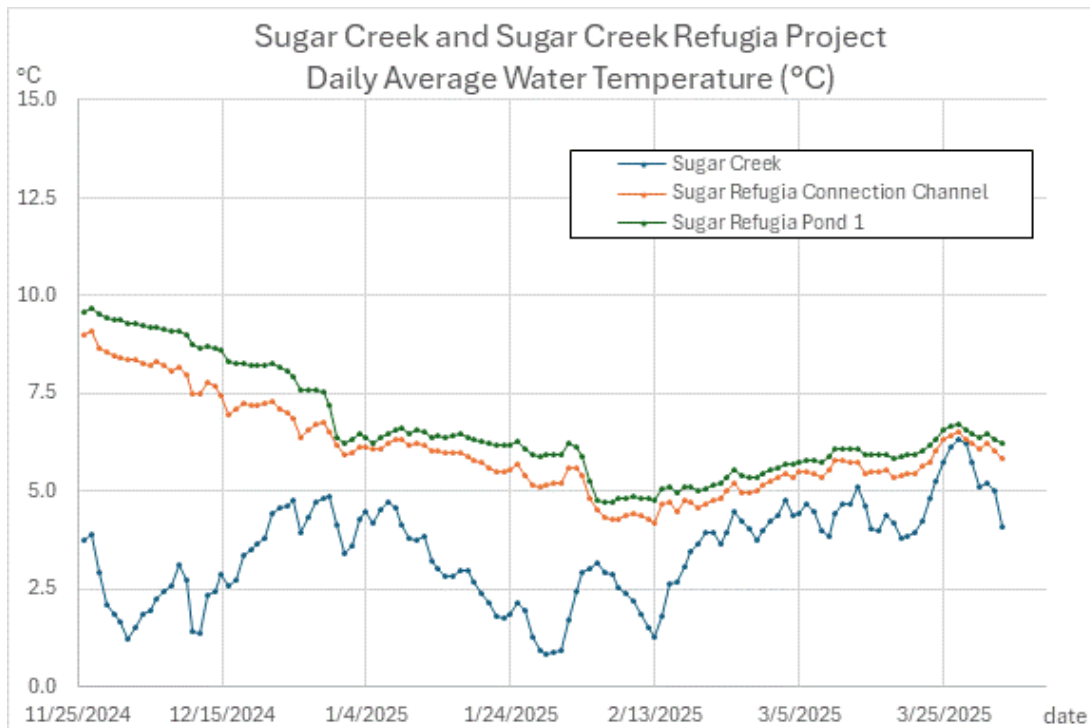


Figure 1 - Daily average water temperature (°C) - Sugar Creek and Sugar Creek Refugia Project

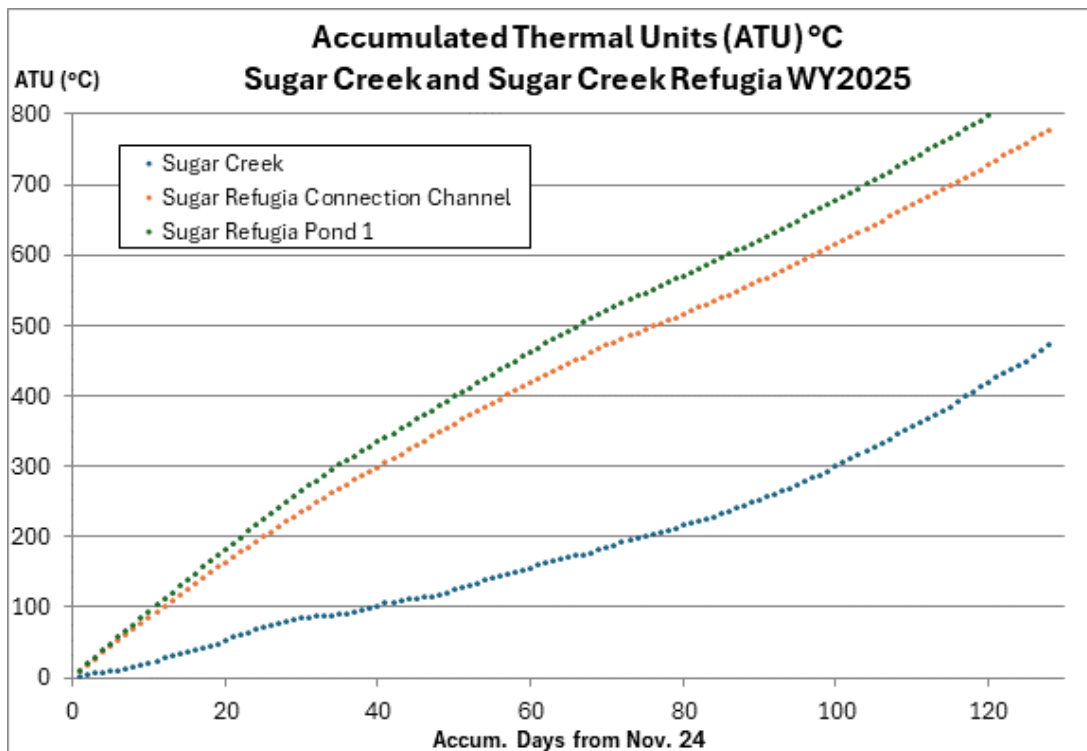


Figure 2 - Accumulated Thermal Units (ATUs) from November 24, 2024 - Sugar Creek and Sugar Creek Refugia Project

Date of ATU Achievement - 11/25/2024 Fertilization

Stage	ATU (°C)	Sugar Creek Mainstem	Sugar Refugia Connection Channel	Sugar Refugia Pond 1
To Eyed	220	2/6/2025	12/22/2024	12/19/2024
To Hatch	400	3/24/2025	1/19/2025	1/13/2025
To Hatch	500	--	2/8/2025	1/29/2025
To Emergence	700	--	3/19/2025	3/8/2025
To Emergence	800	--	--	3/24/2025

Table 1 - Date of ATU achievement for stages of embryonic development of Coho Salmon in Sugar Creek and Sugar Creek Refugia Project

Elapsed Days

Stage	ATU (°C)	Sugar Creek Mainstem	Sugar Refugia Connection Channel	Sugar Refugia Pond 1
To Eyed	220	74	28	25
To Hatch	400	120	56	50
To Hatch	500	--	76	66
To Emergence	700	--	115	104
To Emergence	800	--	--	120

Table 2 – Number of elapsed days from December 24 of ATU achievement for stages of embryonic development of Coho Salmon in Sugar Creek and Sugar Creek Refugia Project