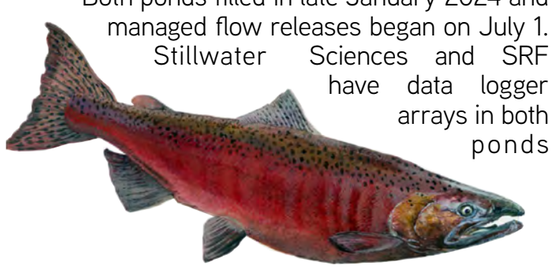
Success! Salmon returning

SRF Marshall Ranch Update

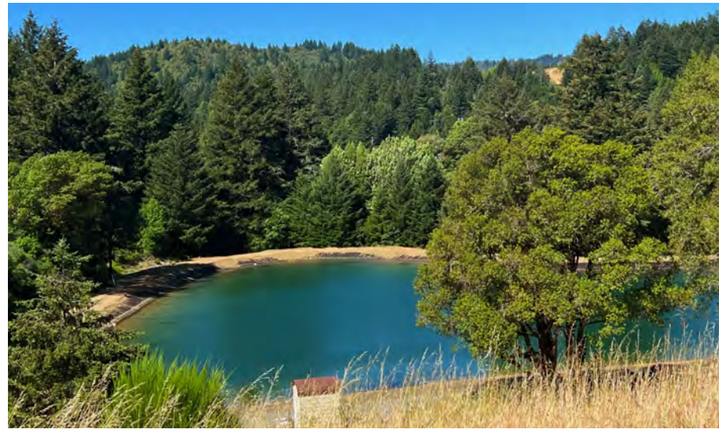
Flow Augmentation Season Underway

In the summer of 2023, Salmonid Restoration Federation (SRF) constructed two large off-channel ponds at the historic Marshall Ranch in Redwood Creek, a tributary of the South Fork Eel River. The Marshall Ranch is the largest contiguous private holding in Redwood Creek and is fully protected under a conservation easement. This working ranch has been in the Marshall family's ownership since the 1800s and is protected in perpetuity. Utilizing conservation "envelopes" for restoration opportunities such as this flow-enhancement project that includes the ten million gallons of winter water storage between two off-channel ponds and over 100,000 gallons stored in water tanks plumbed for fire-fighting emergencies. The purpose of this project is to release cool water into Redwood Creek during the five-month dry season to benefit threatened salmonids and other aquatic species. The flow releases will benefit the mainstem of the creek from the Marshall Ranch in Briceland, all the way to the confluence with the South Fork Eel River in Redway.

Both ponds filled in late January 2024 and managed flow releases began on July 1. Stillwater Sciences and SRF have data logger arrays in both ponds to measure water level, temperature, and dissolved oxygen. SRF is also measuring the water temperature at the release point, upstream and downstream of the release point, and turbidity. Our target flow goals are to contribute 30 gallons per minute of cool water to Redwood Creek that is suitable for coho salmon. Water is being released from the West pond (the lower pond adjacent to Redwood Creek) and sent through the cooling gallery which passively cools, slows, spreads, and sinks the water on its path to the creek. The cooling gallery was an innovative way of adding ancillary restoration benefits by treating the deeply incised channel by filling it with rock, boulders, and rock armor to slow water and minimize sediment transport. The cooling gallery has effectively reduced water temperature from 76 degrees (the current temperature in the West pond) to 61 degrees at the release point which is cooler than the surface water in Redwood Creek. The temperature in the West pond is much higher than we had hoped because the pond did not stratify as anticipated so the cooling gallery has been a significant feature in the flow augmentation regime.



Fortunately, the East pond (upper pond) did stratify as anticipated and the water at the bottom of the pond has consistently stayed below 60 degrees. One difference with how the water behaved is that the West pond did not have a gravel liner over the black geotechnical fabric so temperatures were warmer. For the East Pond, we used native material on site to cover the liner in order to maximize its lifespan. Although it made sense to utilize surplus native material, there were fine sediments, and the project team thought it was best to see how the native gravel mix worked before also lining the West pond.



Assessment and Adjustments

Throughout the winter, the West pond appeared to have superior water quality and the East pond had suspended sediment and some areas where gravel slipped during the first heavy rain. Ultimately the greater depth and even the suspended sediment of the East pond may have contributed to the cooler water temperatures.

This summer, at the end of the flow augmentation season, we will cover the liner in the West pond with screened native material and clean gravel which should mitigate the water temperature issue. Fortunately, the cooling gallery has served to reduce both water temperature and turbidity and the released water is both cooler and less turbid than current Redwood Creek surface water conditions.

Other construction elements this summer include installing the super valves and instrumentation that will allow us to program releases and access real-time data remotely; the construction of the 90,000-gallon steel tank; and fencing at the end of the construction season.

Snorkel surveys were also conducted on July 25 downstream of the flow augmentation site.

This year, we observed a significant increase in both pool size and salmonid abundance compared to the previous two years of surveys. In the July 2023 survey, only one coho was noted at the same stream sites. In contrast, this year's survey revealed several hundred juvenile coho.

In addition to the Marshall Ranch flow augmentation project, SRF has designed five Storage and Forbearance projects downstream of the Marshall Ranch to ensure that the flow releases remain instream for multiple beneficial uses.

If you are interested in learning more about this project, please visit

https://*www.calsalmon.org/programs/marshall-ranch-flow-enhancement*

Water is released from the West pond to the cooling gallery which cools, slows, and releases the water into Redwood Creek. Despite the high water temperature in the pond, the water released from the cooling gallery is approximately 60 degrees and suitable for juvenile salmonids.