Seaside Groundwater Basin
Phase 1 Aquifer Storage and Recovery Project

Phase 1 ASR Project Purpose

As simulated, the Phase 1 ASR Project would be operated so that the increased groundwater production from the Seaside basin during the dry season would allow corresponding reductions in diversions from the Carmel Valley alluvial aquifer during this time. These reductions would, in turn, result in less groundwater storage depletion in the alluvium and more streamflow farther down the channel for a longer time. The increased groundwater storage and streamflow conditions would provide improved habitats for the threatened Carmel River steelhead and California red-legged frog populations.

Phase 1 ASR Project Yield

Simulation results, based on a 45-year period of analysis, indicate that the average annual yield from the Seaside basin due to the Phase 1 ASR Project would be approximately 1,050 afy. However, both the amount of water diverted for injection and the amount of water recovered would vary each year depending on Carmel River flow conditions and Cal-Am customer demand, respectively.

It should be noted that any increase in Cal-Am's ability to reliably divert from the coastal area of the Seaside Basin would be offset by a corresponding decrease in Cal-Am's need to continue its unlawful diversions from the Carmel Valley alluvial aquifer. Consequently, there would be no new yield available for new connections or intensified existing uses.

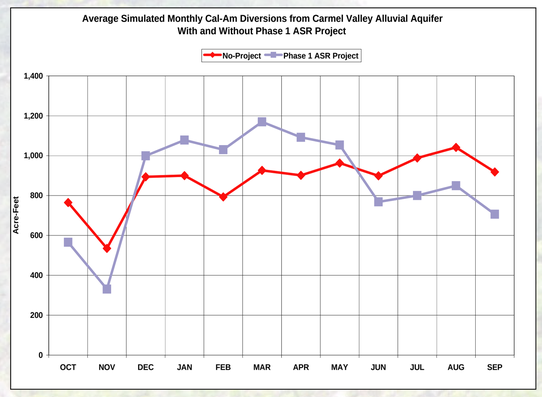
Phase 1 ASR Project Benefits

As initially sized, the most direct benefit of the Phase 1 ASR Project would be an increase in the amount of groundwater storage in the Lower Carmel Valley alluvial aquifer during the dry season. During normal years, simulated end-of-month usable storage would be between 130 and 1,170 af greater during the dry season with the Phase 1 ASR Project. This increased storage would allow more persistent streamflow in the upper reaches of the Lower Carmel Valley aquifer during the dry season, faster filling of the aquifer during the following rainy season, and earlier flow to the ocean.

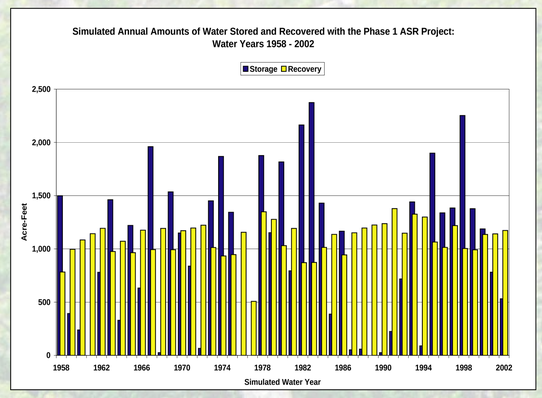
In the simulations, the Phase 1 ASR project was purposely operated to improve streamflow conditions for steelhead migration to the sea during the spring months of dry years. Simulated results for Water Year 1991, a dry year, indicate streamflow at the Carmel River lagoon would be approximately 5 to 70 cfs greater in April and May with the Phase 1 ASR Project. Sufficient spring flows are necessary for successful smolt emigration, which is critical for sustaining a viable steelhead run in the Carmel River.

Phase 1 ASR Project Cost

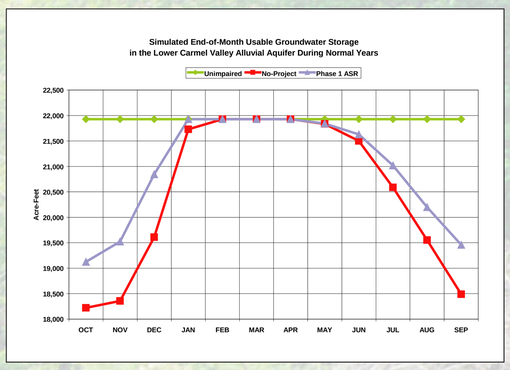
The overall cost of the Phase 1 ASR Project would include one-time design, permitting, and construction costs and ongoing operation and maintenance costs. Preliminary estimates indicate that the capital costs would be $3.3 million and the annual operations and maintenance costs would be $0.3 million in 2005 dollars. Amortized over 20 years, the annual cost for the project is estimated to be $535 per acre-foot.



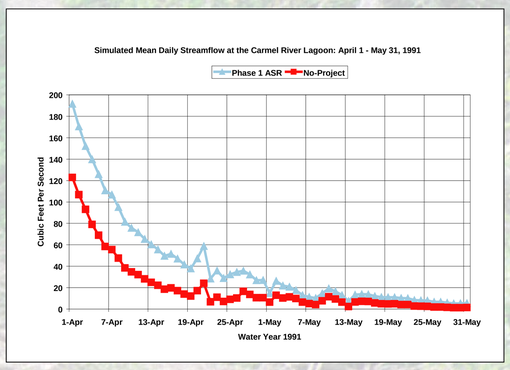
Average Simulated Monthly Cal-Am Diversions from Carmel Valley Alluvial Aquifer With and Without Phase 1 ASR Project



Simulated Annual Amounts of Water Stored and Recovered with the Phase 1 ASR Project: Water Years 1958-2002



Simulated End-of-Month Usable Groundwater Storage in the Lower Carmel Valley Alluvial Aquifer During Normal Years



Simulated Mean Daily Streamflow at the Carmel River Lagoon: April 1 - May 31, 1991

View of Carmel River looking downstream at river mile 5 showing typical dewatered conditions during summer months with current operations.

View of Carmel River looking downstream at river mile 5 showing flowing river during summer months with proposed ASR Project operations.

View of Carmel River at river mile 5 showing steelhead spawning.

Conclusion

The District's proposed Phase 1 ASR Project draws from past lessons regarding the role of groundwater in stream systems and provides a glimpse of future prospects for river restoration efforts. In designing the Phase 1 ASR Project, it was recognized that groundwater practices in alluvial groundwater basins can have a direct and adverse impact on stream systems and dependent resources. It was also recognized that, with prudent planning, groundwater practices could be modified to take advantage of excess supplies in the Carmel Valley alluvial groundwater basin and available storage capacity in the adjacent Seaside groundwater basin. Put together, the proposed ASR Program offers the promise of improved streamflow and habitat conditions in the Carmel River

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