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MEADOW RESTORATION AND CLEAN WATER

Indian Valley

Meadows provide a natural storage opportunity, critically important with a changing climate.
– California Department of Water Resources

Indian Valley sits atop the Sierra Crest, 30 miles south of Lake Tahoe. The 250 acre meadow was once a high-elevation sponge that soaked up spring snowmelt and slowly released water throughout the summer. However, historic overgrazing caused erosion and downcutting of the stream channel and formed a network of gullies that quickly drained water from the meadow. In 2012, a partnership that included the US Forest Service, National Fish and Wildlife Foundation, Coca Cola and American Rivers restored the meadow by filling the gully and once again enabling flood waters to spread out and soak in. As a result, groundwater storage increased, the water table rose, and streamflow increased during the late summer months. The vegetation responded because roots could now reach the water. In 2016 an endangered Willow Flycatcher returned to the valley for the first time in more than a decade and now mink hunt and trout swim in the stream that was once dry.

September 2012: Before Restoration & Before Drought

September 2014: After Restoration & During Drought

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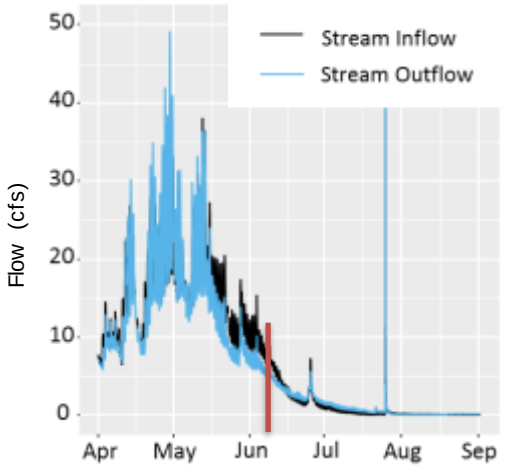
In Indian Valley, scientists measured how meadow restoration affected streamflow by comparing flows into and out of the meadow. During springtime, when the meadow was absorbing water, stream inflow exceeded outflow (before the red line in graph). In summer, the reverse was true; the outflow exceeded the inflow, indicating that the meadow augmented streamflow (after red line).



Restoration substantially increased the ability of the meadow to soak up spring runoff and augment summer flows (see table below). During summer of 2012, the total flow into the meadow was 18.6 acre feet and the outflow volume was 21.2 acre feet. The meadow added 2.6 acre feet, which amounted to a 14% increase in streamflow. After restoration, the total flow into the meadow was less due to the drought, 13.4 acre feet, but the summer outflow from the meadow totaled 28.6 acre feet, a 34% increase over pre-restoration conditions, even though inflows were reduced. After restoration, the meadow added substantially more flow, 15.2 acre feet and increased the stream volume by 113% during the dry summer months.

	Year	Snow Water Equivalent (inches as of May 1st)	Total Summer Inflow (acre feet)	Total Summer Outlfow (acre feet)	Volume added by the meadow (acre feet)
Before Restoration	2012	13	18.6	21.2	2.6
After	2014	11.9	13.4	28.6	15.2

Research in Indian Valley shows that mountain meadows are in fact landscape sponges that shift the timing of flow to provide water when streams need it most. By storing water and prolonging streamflows, healthy meadows will also help headwater streams adapt to climate change, which has already shifted peak snowmelt earlier in the year in the central Sierra Nevada.

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