

Nature-Based Solutions: Enlisting Natural and Working Lands in the Sacramento River Basin in the Fight against Climate Change

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Water resources managers in the Sacramento River Basin are engaged in a comprehensive effort to help manage the regions' water and land resources from the ridgetop all the way down the watershed to the river mouth using nature-based solutions that provide multiple benefits and water supply reliability for cities, farms, fish, birds and other wildlife, hydropower production, and recreation. These efforts will help protect and restore our biodiversity through forest management, floodplain reactivation, sustainable groundwater management, and healthy soils management. These nature-based solutions will enhance the region's economy and food production by allowing working lands to provide food for human consumption, and also provide food and habitat for the region's terrestrial and fish species. These approaches will also build climate resilience, and promote species recovery.

Implementing these approaches will require continued collaboration among landowners, conservation organizations, water managers, local governments, and support from state and federal water and resource management entities. This is why Governor Newsom's Nature-Based Solutions Executive Order (N-82-20), and President Biden's January 27, 2021 Executive Order on Tackling the Climate Crisis at Home and Abroad are so important to advancing these solutions.

In his October 7, 2020 statement announcing the Executive Order, Governor Newsom provided that "California's lands provide an important resource in limiting the impacts of climate change while protecting our communities from climate change-driven events such as wildfire, floods, droughts, and extreme heat. The state's natural and working lands sustain our economy, support our unique biodiversity and contribute to the global food supply." He then directed state agencies "to pursue innovative actions, strategies, and partnerships to maximize the full benefits of our natural and working land," while encouraging state agencies to "advance multi-benefit, voluntary, and cooperative approaches that protect and restore biodiversity while stewarding natural and working lands, building climate resilience, and supporting economic sustainability." (EO, 1e.)



President Biden’s Executive Order directed federal agencies to collect input from stakeholders on how “to encourage the voluntary adoption of climate-smart agricultural and forestry practices that decrease wildfire risk fueled by climate change and result in additional, measurable, and verifiable carbon reductions and sequestration and that source sustainable bioproducts and fuels; and...to make fisheries and protected resources more resilient to climate change, including changes in management and conservation measures, and improvements in science, monitoring, and cooperative research.” The Biden Administration has also submitted a preliminary report to the National Climate Task Force in May 2021, titled “[Conserving and Restoring America the Beautiful](#),” which recommends adhering to eight guiding principles for conservation efforts: Pursue a Collaborative and Inclusive Approach to Conservation; Conserve America’s Lands and Waters for the Benefit of All People; Support Locally Led and Locally Designed Conservation Efforts; Honor Tribal Sovereignty and Support the Priorities of Tribal Nations; Pursue Conservation and Restoration Approaches that Create Jobs and Support Healthy Communities; Honor Private Property Rights and Support the Voluntary Stewardship Efforts of Private Landowners and Fishers; Use Science as a Guide; and, Build on Existing Tools and Strategies with an Emphasis on Flexibility and Adaptive Approaches.

There are unique opportunities in the Sacramento River Basin for **nature-based solutions** that call upon natural and working lands for “reducing the risk of catastrophic wildfire, absorbing floodwater, cooling communities, providing habitat, and more.” Read more about these opportunities below.



FOREST HEALTH

The forests and meadows of the Sierra Nevada, Coast Range, and Cascade Mountains are the source waters for much of the Sacramento River Basin and the State of California. Healthy headwaters ensure increased water supply reliability and reduced flooding risks, improved water quality, reduced impacts from catastrophic wildfires, increased renewable energy supplies, enhanced habitat, and improved response to climate change and extreme weather. The Governor has called on “active forest management to reduce catastrophic risk and restore forest health.” Examples of these management activities we can build upon include the Placer County Water Agency’s [French Meadows Forest Restoration Program](#) in the American River watershed and the Yuba Water Agency’s pioneering efforts to finance [watershed restoration activities](#) through Forest Resilience Bonds. These programs are leading examples of innovative, collaborative, and replicable models for improving forest health.

REACTIVATING OUR FLOODPLAINS

The Sacramento River Basin is fertile ground for developing a new path to [reactivate our floodplains](#) as a new way forward. This approach will protect public safety and integrate best available science about how river ecosystem's function with the practical know-how of farm, flood, and wildlife refuge managers. Implementing these dynamic conservation strategies will build resiliency in California's ecosystems and water systems by sustaining the abundant return of migratory birds along the Pacific Flyway; revitalizing river food webs and supporting the recovery of salmon and other fish populations; recharging groundwater aquifers; and improving flood protection in an era of increasing storm severity and a changing climate. [Floodplain reactivation occurs](#) on both the wet-side of the levees (within the current flood protection system, including the river channels and bypasses) and the dry-side (in farm fields – primarily winter-flooded, post-harvest rice fields – located outside the current flood protection system but within the historic floodplain). To further advance these efforts, the [Floodplain Forward Coalition](#) has developed a [Portfolio for Fish and Wildlife](#) to reactivate the floodplain in the Sacramento River Basin.



GROUNDWATER MANAGEMENT AND RECHARGE

The Sacramento River Basin is generally in balance with respect to its surface and groundwater resources. This is a result of a concerted, long-term effort by local agencies working with landowners and state and federal agencies to promote sustainable water management in the region. The active and conjunctive management of surface and groundwater has played an important role in this balance and will continue to play an increasingly important role as groundwater use expands and intensifies in certain parts of the Sacramento Valley. This dynamic is described in [Fact Sheet: The State of Sacramento Valley Groundwater](#) and a [2014 Sacramento Valley Groundwater Assessment](#). Active groundwater and aquifer recharge utilizing the region's natural infrastructure will be important in many parts of the Sacramento Valley to maintain and help achieve sustainability, particularly around the small pockets where groundwater levels may be declining or not recovering during wet periods as quickly as they have in the past. While the Sustainable Groundwater Management Act (SGMA) is a high priority for California, we believe that the state can best add value to help local agencies advance groundwater recharge to help achieve balance under SGMA. A specific Executive Order would be helpful to advance this effort.



HEALTHY SOILS MANAGEMENT

Farmers, ranchers, refuge, and wetlands managers in the Sacramento River Basin manage their land to promote healthy soils to benefit their agronomic and environmental pursuits. The Governor, recognizing that California “feeds the nation and world through its agricultural activities,” has pointed to the importance of “healthy soils management, including planting cover crops, hedgerows, and compost applications.” There are several programs in place that land managers are using to help guide and incentivize these practices. The California Department of Food and Agriculture’s [Healthy Soils Initiative](#) promotes the development of innovative farm and land management practices that contribute to building adequate soil organic matter that can increase carbon sequestration and reduce overall greenhouse gas emissions. There are also various cover crop programs in the Sacramento River Basin that will reduce runoff through improved infiltration (movement of water through the soil surface) and percolation (movement of water through the soil profile). Cover crops also increase soil organic matter, leading to

improvements in soil structure, stability, and increased moisture and nutrient holding capacity for plant growth. The California Rice Commission has developed the “Upland Habitat Nesting Initiative” program to promote cover crops on fallowed rice ground to provide habitat for nesting waterfowl. California State University at Chico, with support from the federal Natural Resources Conservation Service, has a program to help orchard/vineyard, rangeland, dairy, and row crop producers implement Soil Health Management Systems to improve soil function, water infiltration, and availability and protect biodiverse habitats in Northern California’s agro-ecosystems.

Ridgetop to River Mouth Water Management is described in more detail in the North State Water Alliance’s [How Water Management Investments Improve the Environment in Northern California](#). The NCWA 2021 Annual Meeting highlighted Ridgetop to River Mouth Water Management and the various elements can be seen [here](#). For more information, please contact us at: info@norcalwater.org.

