2020 California Envirothon
"Water Resources Management: Local Control and Local Solutions"
Current Issue Scenario

Background

Governor Gavin Newsom has directed State agencies to prepare a Water Resources Management Strategy for California. The objectives of the Strategy is to build a climate-resilient water system and maintain a balanced, diverse, safe and reliable water supply for agriculture, urban, and the natural environment. It includes recharge strategies to bring into balance groundwater supplies and demands as groundwater aquifers are severely overdrafted. A particular focus is the plummeting fish populations due to inadequate flows, warming water temperatures, pollutants, and loss of wildlife habitat which has resulted in some species being listed as endangered under both the State and Federal Endangered Species Act (ESA) (e.g., chinook salmon). Another important goal is to protect the future health and economy of local communities.

The Governor's order directs the secretaries of the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Food and Agriculture, to work with local partners to develop place-based Coordinated Water Resources Plans (CWRPs) which identify and assess an array of complementary actions to ensure safe and resilient water supplies, flood protection, healthy ecosystems, and a vibrant economy.

The locally developed five year CWRPs will provide flexibility, capturing the diverse needs, resources and solutions available in different regions of the state. Further, it is recognized that local entities have the local planning authority, control of revenue, and the budget resources needed to implement the CWRPs. Partnerships with local stakeholders such as farmers and ranchers, nonprofits, planners, water districts, and all levels of government agencies are a vital component of this effort as multi-benefit projects will require multi-partners.

A key feature of a CWRP is the development of a suite of Voluntary Agreements (VA) among private landowners, government agencies, flood control districts, special districts (e.g., RCDs) and non-government agencies to implement CWRP recommendations, projects, and actions. A successful CWRP will provide benefits locally, regionally, statewide, and even globally.

The CWRP emphasizes watershed interconnectivity: upper and lower watershed, and surface and groundwater. It focuses on connected thinking, socioeconomics, institutional linkages, and stakeholder and public engagement. While it depends on local cooperation and voluntary actions, it is rooted in statutory environmental requirements, laws, and programs: ESA, Clean Water Act, Farm Bill conservation incentive programs, the state Porter-Cologne Act, the Sustainable Groundwater Management Act, Department of Water Resources' Flood-MAR program, and the California Department of Food and Agriculture's Healthy Soils Program.

The state agencies are clearly aware that local control and solutions cannot be successful without additional motivation, incentives, and healthy dialogue. They know at some level, state involvement is appropriate and necessary to provide support and assistance. Essentially, it is local control to the extent possible with emphasis on local leadership and stewardship. The state and federal agencies will assert their respective statutory jurisdictions should local CWRPs be deemed inadequate toward fulfilling the goals of the Strategy or if one is not submitted.

Setting

The San Joaquin Valley —California's largest agricultural region and an important contributor to the food supply of the nation and globally—is ground zero for many of the most difficult water management problems: groundwater overdraft, water quality and supply, and declines in habitat and native species.

The multi-generational farmers in the Tres Puntos Arroyo (TPA) watershed in the southern San Joaquin Valley, produce almonds, pistachios, grapes, stone fruit, and field crops on approximately 10,000 acres. There are approximately 5,000 small farms. The TPA watershed represents a microcosm of the water resources management problems found in the San Joaquin Valley.

The TPA is a tributary to the Queens River. The Queens River flows through the valley floor from its headwaters high in the snow capped mountains of the Sierra Nevada. The Queens River floodplain is known to experience 50 to 100 year flood events, however, with the phenomenal atmospheric rivers, the most recent one was considered a 300 year event.

The Richard Campbell National Forest is the headwaters of the Queens River. Its ecology is diverse and complex. The combination of climate, topography, moisture, and soils influences the distribution of ecological communities across an elevation gradient from 1,000 to 14,500 feet. Biotic zones range from scrub and chaparral communities at lower elevations, to subalpine forests and alpine meadows at the higher elevations. Particular eco-regions follow elevation contours along the length of the range.

The subalpine forest is near 9000 feet in elevation. The climate is cooler with an even shorter growing season due to long, cold, and snowy winters. The marginal conditions make the Sierra Nevada subalpine zone sensitive to environmental changes, such as climate change and pollution. Accumulations of nine feet of snow are typical, however, with increasing tree density and the effects of climate change, the forests consume more water and the snowpack is not as deep as before. Subalpine meadows characterized by meandering streams and floodplains, act like sponges, soaking up snowmelt, filtering it, and releasing it slowly, extending runoff into the dry California summer. Today, many meadow floodplains are channelized and in poor condition due to loss of vegetation, pollution, and scant precipitation due to global warming. Given the connectivity of the natural landscape, this has dire consequences to animal species in the subalpine zone.

Downstream is the Alberto Dam and reservoir (Victoria Lake). Below the dam, lays the floodplain which once provided a robust natural habitat for salmonid species and migratory birds. However, due to the combination of the dam, the loss of groundwater, poor water quality, and insufficient instream flows, the population of salmonid species continue to nosedive. Lack of riparian vegetation and tree canopy contribute to increases in water temperature detrimental to migrating or spawning fish. Migratory birds are exposed to starvation and disease.

Below the dam on either side of the river's banks are orchards and active farmland (e.g., row crops, vineyards, etc.). Because of the recent drought and depleted groundwater tables, farmers have had to fallow some fields due to water scarcity.

The local groundwater aquifer has been severely oversubscribed caused by increased pumping to provide a source of irrigation water. More frequent groundwater pumping has created the movement of plumes carrying contaminants such as nitrates, pesticides, fertilizers, cleaning solvents, and salts. Domestic private wells have become polluted jeopardizing public health. Moreover, as surface water supplies dwindled and domestic wells became contaminated, farmers were forced to dig new and

deeper wells at great cost for those who can afford it. It has been observed that the land is sinking at a rate of four inches a year (i.e., land subsidence) due to the loss of groundwater levels.

As the river continues downstream, riparian habitat dots the landscape---once widespread and contiguous. Due to harmful farming practices and urban development, these once historic wetland and riparian areas are either gone or are now mere remnants of a once thriving ecosystem.

The soils map of the area shows an alluvial aquifer composed of gravel, sand, silt and clay that have been eroded from surrounding rocks deposited by running water and sometimes wind. Given its permeability, they can hold large quantities of water for delivery to wells. The exact number of wells in the area is not well known, but estimates are that the number lies between 5,000 to 8,000.

Scenario

The Tres Puntos Arroyo Resource Conservation District has agreed to work with local farmers to provide technical assistance and develop resource management strategies to incorporate into a locally developed Coordinated Water Resources Plan. The TPA RCD has engaged the local NRCS Field Office, UC Cooperative Extension, and the US Forest Service for collaboration, cross agency communication, and consultation. Together, they will identify and organize a variety of Voluntary Agreements with key agencies and groups necessary to carry out the CWRP.

After a series of listening sessions and meetings with the community, partners, and stakeholders, the TPA RCD is preparing the final CWRP with its findings and recommendations to submit to the State. The final five year Plan will address the following local water resources problems with proposed VAs consisting of local solutions and strategies, options for meeting local water needs, propose a timeline, and possibly new ways of thinking:

1. Sustainable Groundwater Management (SGMA): SGMA ensures the balancing of groundwater supplies and demands. SGMA requires local water users to bring groundwater use to sustainable levels. It makes certain the groundwater basin is operated within its sustainable yield without causing significant and unreasonable chronic lowering of groundwater levels, reduction of storage, degradation of water quality, land subsidence, and depletion of interconnected surface and ground waters.

   Some of the consequences of SGMA includes demand for greater water conservation and irrigation efficiencies, different cropping considerations, and some permanent idling of farmland. Analyze the potential uses or economic opportunities for idled land for repurposing: solar energy, multi-benefit restoration of the valley's historic riparian, wetland and desert ecosystems; expansion of riparian corridors and floodplains; dedicated recharge areas; create intermittent wetlands; permanently retire croplands or fallow them in rotation for shorter periods changes; and carbon storage. What would the impacts be to the local economy and natural resources?

2. Watershed Interconnectivity: Develop a plan considering an integrated, connected, and holistic watershed approach, to identify upper watershed projects to maximize water yield, supply, and recharge aquifers. What key partners are needed to plan, organize and fund such projects? What sources of funding might be leveraged?

3. Groundwater Replenishment: Recharging groundwater could deliver supplies a farmer can afford. Based on the local soils survey map of farmlands in the area, identify field acreage most

conducive to aquifer recharge. Suggest ideas to incentivize recharge on farmlands such as spreading water on suitable fields when excess stormwater flows are available. Explore incentives such as when lands are exchanged for recharge areas, such as "credits" given to the farmer to have the ability to pump groundwater from these recharge areas in the future.

4. "Growing the Water Pie": Retaining and storing local stormwater runoff, and tailwater capture, to augment supply, boost water storage and capacity (i.e., storage = retention). It also increases regional self-sufficiency and less reliance on outside or imported water sources. Describe the economic, environmental, and social benefits. Consider some of the options: including local infrastructure and scale, for physically holding this water for reuse on farmland or groundwater recharge; purposing farm land as a bypass or as a conveyance to deliver flood flows for recharge and ecosystem benefits. How does the Department of Water Resources' Flood-MAR Program inform decision making?

5. "Loyal to the Soil": Healthy soils are important to store more water and more efficiently use scarce water, as well as sequester carbon and reduce greenhouse gases. Develop a list of recommended soil management practices such as cover cropping, no-till, reduced-till, mulching, compost application, and conservation plantings. Investigate incentives to fund these practices through the California Department of Food and Agriculture's Healthy Soils Program as well as other conservation funding programs. Motivate and incentivize farmers about the multi-benefits for widespread implementation on farmland.

6. "Swimmable/Fishable": Sufficient water flows, connected habitat, clean and cool water are vital to the survival of endangered fish species. What kinds of projects or opportunities can be suggested to reduce water temperature, improve water quality, wildlife habitat, and instream flows? Who should pay for these projects and why? Identify opportunities for funding, partnerships, and incentives.

7. Feedback Loop: How would you monitor the success of these local solutions? Develop parameters for a monitoring strategy to assess progress, setbacks, and make needed adjustments.

8. Financial Plan: Create a budget covering the first three years to support recommendations for land and water conservation, increase supply and reliability, improving water quality, groundwater sustainability, and ecosystem improvements. It should include financial options and funding opportunities available to provide assistance through local revenue, tax incentives/credits, government grants or cost sharing, government assistance contracts, water user fees, or general obligation bond initiatives. Identify new revenue streams that can be created to support private landowners engaging in conservation-oriented management.

9. Public Participation: Moving beyond institutional goals, self interests, and entrenchment is vital to the realization of a viable, acceptable, and successful CWRP. Prepare a public engagement strategy to allow the participation of diverse groups; facilitate effective partnerships and multi-stakeholder collaboration. Describe your approach to achieve local input and buy-in (pre and post CWRP), and list key partners including what each will bring to the table (e.g., technical and/or financial assistance, investments, new legislation, programmatic and policy help).

10. Review: Provide a general analysis of the CWRP's multi-benefits to the community, local economy, and natural resources.