

Date of Hearing: April 24, 2023

ASSEMBLY COMMITTEE ON WATER, PARKS, AND WILDLIFE

Rebecca Bauer-Kahan, Chair

AB 923 (Bauer-Kahan) – As Introduced February 14, 2023

SUBJECT: Flood plain restoration projects: Central Valley: study

SUMMARY: Requires the Department of Water Resources (DWR), in coordination with the Central Valley Flood Protection Board (CVFPB), to undertake a study regarding barriers to the implementation of flood plain restoration projects. Specifically, **this bill:**

- 1) Requires DWR, with CVFPB, to identify and assess barriers to the implementation of flood plain restoration projects that provide increased flood risk reduction and groundwater recharge benefits.
- 2) Requires DWR and CVFPB to conduct broad stakeholder outreach to inform the study including, at a minimum, cities, counties, local flood control agencies, nongovernmental organizations, community-based organizations, and academia.
- 3) Requires the study to make recommendations to the Legislature on ways to expedite and scale the implementation of flood plain restoration projects that provide flood risk reduction and groundwater recharge benefits.
- 4) Requires the study be completed by July 1, 2024.

EXISTING LAW:

- 1) Authorizes DWR to make examinations of lands subject to inundation and overflow by flood waters and of the waters causing the inundation or overflow and to make plans and estimates of the cost of works to regulate and control the flood waters (Water Code § 8300).
- 2) Requires DWR to prepare, and the CVFPB to adopt, a plan identified as the Central Valley Flood Protection Plan (Water Code § 9600 *et seq.*).
- 3) Declares that a large portion of the state's resources are subject to recurrent flooding and that the flood plains of the state are a resource to be developed in a manner that will prevent loss of life and economic hardship. It also finds that the primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish flood plain management rests with local levels of government, although it is the policy of the state to encourage and assist in flood plain management (Water Code § 8400 *et seq.*).
- 4) Requires DWR, with other public agencies, to conduct an investigation of the state's groundwater basins, including general patterns of groundwater extraction and groundwater recharge within those basins to the extent necessary to identify basins that are subject to critical conditions of overdraft (Water Code § 12924).
- 5) Provides \$290 million, through Proposition 1E, for the protection, creation, and enhancement of flood protection corridors and bypasses through a number of actions including flood plain mapping (PRC § 5096.825).

- 6) Makes \$300 million available, through Proposition 68, for eligible projects including, levee setbacks, creation or enhancement of flood plains or bypasses, groundwater recharge projects in flood plains, and land acquisition and easements necessary for these projects (PRC § 80145).
- 7) Provides \$30 million for flood plain mapping as a part of Proposition 84 (PRC § 75031).

FISCAL EFFECT: Unknown. This bill is keyed fiscal.

COMMENTS:

- 1) **Purpose of this bill.** This bill requires DWR, with CVFPB, to identify and assess barriers to the implementation of flood plain restoration projects that provide flood risk reduction and groundwater recharge benefits. According to the author, “there is broad consensus that flood plain restoration projects provide multiple benefits including flood protection, groundwater recharge, and fish and wildlife habitat, and are a vital climate resilience strategy. With increasing flood risk due to climate change, it is critical that we promote these kinds of projects. The implementation of these projects, however, moves too slowly. This bill would require DWR and CVFPB, after stakeholder outreach, to report on the barriers to flood plain restoration projects.”
- 2) **Background.** Prior to the arrival of Europeans, California's flood plains were largely managed by Indigenous communities. The California Gold Rush brought a large influx of settlers to the state in the mid-1800’s who modified flood plains by constructing levees and other flood control structures to flush out mining debris and preserve river navigability. During the 20th century, California experienced significant population growth and urbanization. As a result, many of the state's flood plains were developed for agriculture, urbanization, and other uses, leading to the loss of wetlands and other important habitat.

Today, the level of flood risk in California’s Central Valley is among the highest in the nation. According to the *Central Valley Flood Protection Plan (CVFPP) 2022 Update*, 1.23 million people and more than \$223 billion in structures and property are at risk from flooding. With historic storms like the Great Flood of 1862 and even more recent events like the series of atmospheric river-fed storms from winter 2023, human-made flood management efforts struggle to compete against the natural state of the Central Valley. Analysis done as part of ARkStorm 2.0 indicates that climate change has already increased the frequency and magnitude of severe storms that result in “megaflood” events.¹ In recent decades, there has been a growing recognition of the value of flood plains for ecosystem services such as water storage, groundwater recharge, and wildlife habitat. In fact, 2,100 acres of restored flood plain (former farmland) are believed to have been responsible for preventing serious damage to the community of Grayson during the 2023 winter storms.²

¹ Huang, X. and Swain, D. L. [Climate change is increasing the risk of a California megaflood](#). *ScienceAdvances*. (2022)

² Trotta, D. [California town wonders if restored flood plain prevented disaster](#). *Reuters*. (February 6, 2023)

The CVFPP 2022 Update acknowledges the importance and function of flooding as a natural part of riverine and flood plain ecosystems and the beneficial functions of flood plains as natural infrastructure. This understanding is in alignment with state priorities for nature-based solutions, as well as the opportunity to use floodwaters to support groundwater recharge efforts, greater water sustainability, and climate resilience throughout the Central Valley. As a result, there has been a shift toward restoring flood plains and reconnecting them with rivers to improve their ecological function and reduce flood risk.

Flood plains. A variety of physical structures have been developed to convey and control water flows and floods, including levees, weirs, detention basins, dams, and seawalls. Nonstructural approaches also include preserving and enhancing natural flood plain functions such that undeveloped lands can slow and absorb floodwaters before they reach developed areas. Actions include purchasing easements to preserve lands so they remain available for periodic inundation, or setting back levees and widening channels to allow the river greater access to its original flood plain and accommodate a higher volume of flows. Efforts can also include improving the effectiveness of existing flood plains, such as removing vegetation or sediment that impede floodwater flows.

Flood bypasses combine structural approaches to control floodwaters with the nonstructural approach of utilizing natural flood plain functions. Specifically, levees and weirs are used to direct waters out of river channels into large flood plains—“bypassing” the normal path of the river—so the water can spread and the flow velocity can dissipate. Bypasses are a particularly important part of the State Plan of Flood Control system, which includes four “relief” bypasses (i.e., Sutter, Tisdale, Sacramento, and Yolo bypasses). During periods of high water flows, more than 80% of Sacramento River waters can end up flowing through the Yolo Bypass instead of through the main stem of the river near the City of Sacramento.

Benefits of flood plains. Flood managers, particularly at the state and local levels, have made efforts in recent years to encourage flood management projects that take advantage of the multiple benefits associated with natural flood plain functions. Statewide planning documents—including *California’s Flood Future: Recommendations for Managing California’s Flood Risk* (2013), *The Water Action Plan* (2014), and the CVFPP 2022 *Update*—emphasize the need for an integrated water management approach. These plans highlight that, in addition to protecting public safety, flood management projects can and should achieve additional benefits such as ecosystem restoration, wildlife habitat development, and groundwater recharge.

One example of a positive, multibenefit impact is percolation of water into the ground, helping to filter and replenish groundwater basins for future agricultural and residential uses. Additionally, inundation in natural flood plains can improve habitat conditions for plants and wildlife, such as by providing seasonal flows and creating wetlands needed by migrating fish and birds. For example, recent experiments found that juvenile salmon raised in the flooded Yolo Bypass grew much faster and bigger than those in the main stem of the Sacramento River. Sediments carried and deposited by flood waters can also enrich soils for agricultural purposes. Flood plains can also help dilute and flush out pollutants and contaminants and thereby improve water quality when the flows join streams, rivers, and the ocean. Finally, flood plains can also provide outdoor recreation and education opportunities.

Flood plain restoration projects. Human development and agriculture have greatly reduced the historic footprint of flood plains. There are, however, several projects in recent years that have either restored or are in the process of restoring flood plains. Some examples include:

- Napa River/Napa Creek Flood Protection Project: utilized strategies including riverbank terracing (allowing rising floodwaters room to spread into defined areas), converting pastureland to wetlands that are available to hold excess waters, replacing a number of old bridges that had blocked flows, and incorporating a dry bypass channel to provide a shortcut for fast-moving water that historically had overtopped the normal pathway of the river. The bypass, completed in 2015, flooded for the first time in February 2017 and helped prevent the type of widespread flooding in downtown Napa that occurred during storms in 2005. (Approved by voters in 1998, under construction since 2000);
- The Southport Levee Setback Project: a collaborative effort between the City of West Sacramento, the local flood control agency, DWR, and the U.S. Army Corps of Engineers that set back four miles of the existing levee on the Sacramento River. This will expand the river's width, allowing it greater access to its original flood plain, as well as create 152 acres of new riparian habitat. (Construction began in 2016, though restoration work continues);
- Hamilton City Flood Damage Reduction and Ecosystem Restoration Project: a dual-purpose flood risk management and ecosystem restoration project, which will construct approximately 6.8 miles of levee for improved flood protection and about 1,500 acres of native habitat. The new setback levee will provide improved levels of flood risk management and levee stability. (More than 15 years to complete levee component of project with restoration work expected to be completed in 2025); and
- Dos Rios Ranch Flood Plain Expansion and Ecosystem Restoration Project near Modesto: restored 2,100 acres and 8 miles of river front as well as conserved 7,000 acre-feet of water. (More than 10 years to complete, 20 years if property acquisition is included).

Flood plain mapping. Several entities engage in flood plain mapping, which may be used to support flood plain restoration. The Federal Emergency Management Agency is responsible for developing and updating the Flood Insurance Rate Maps (FIRMs) for communities participating in the National Flood Insurance Program. FIRMs are used to determine flood insurance rates and identify flood hazards in the mapped areas. SB 5 (2007) authorized DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year flood plains for areas located within the Sacramento-San Joaquin Valley watershed. DWR has expanded the BAM to cover all counties in the State and to include 500-year flood plains. The 100-, 200-, and 500-year flood plains are displayed on a web viewer.³ Some counties have also developed their own flood maps.^{4,5}

³ Best Available Maps, DWR, <https://gis.bam.water.ca.gov/bam/>

⁴ Flood Hazard Mapping, https://www.sandiegocounty.gov/content/sdc/dpw/flood/flood_mapping1.html

Challenges in flood plain restoration. A 2017 Legislative Analyst’s Office report, *Managing Floods in California*,⁶ concluded that although flood management needs are great, funding is limited and inconsistent. Some of the key funding challenges include that (1) most funding for flood management activities comes from bonds, which cannot be used for ongoing and maintenance costs, (2) it is difficult for local entities to raise funds, (3) funding that is available for flood-related projects may be restricted for meeting one particular outcome—limiting multi-benefit projects, and (4) the need for flood-related investments fades from public awareness between major floods.

More specifically to flood plain restoration, the Hallwood Side Channel and Flood plain Restoration Project faced several unforeseen challenges.⁷ For example, the project site involved land owned by two competing aggregate production companies and access agreements between these firms required considerable care. There were also environmental limitations and challenges such as higher than anticipated early season groundwater that required creative construction sequencing, river migration that occurred after the initial design phase, and sourcing appropriate material.

According to a Public Policy Institute of California report,⁸ the McCormack-Williamson Tract restoration took nearly a decade to break ground due in large part to a prolonged planning and permitting process and a change in land ownership. The project is large and complex, with landowner concerns about flooding of adjacent properties, impacts to protected species, and the need for compliance under a variety of sections of the federal Clean Water Act, as well as other regulations. The issues surrounding designing a multi-benefit flood management and restoration project—and preparing for the sheer number and complexity of the project’s regulatory requirements—were a substantial drain on project resources. The change in land use (from agriculture with a low-lying levee berm to a tidal marsh) led to extensive discussions about mitigation requirements and increased cost projections. In addition, the restoration of the tract required permits, consultations, and demonstration of consistency with programs under at least 14 state, federal, and local agencies. Project proponents needed to meet many of these requirements through separate processes, increasing costs for all parties and posing the risk that agencies would require inconsistent terms for approval.

Similarly, a 2018 Flood-MAR (managed aquifer recharge) white paper completed by DWR identifies a broad public interest in implementing flood plain restoration projects given California’s changed climate, its accompanying weather extremes, and the multiple benefits (e.g., flood risk reduction, drought preparedness, and ecosystem enhancement) that such projects provide. Despite the upside of Flood-MAR projects identified by the white paper, it also found that “complex technical, legal, and institutional barriers and challenges affect the planning and implementation of Flood-MAR.” These challenges fall into the following categories: 1) cooperation and governance; 2) policy; 3) legal; and 4) implementation. The

⁵ Los Angeles County’s Flood Zone Determination Website, <https://apps.gis.lacounty.gov/dpw/m/?viewer=floodzone>

⁶ Ehlers, R. *Managing Floods in California*. LAO, March 22, 2017. <https://lao.ca.gov/Publications/Report/3571F>

⁷ Southall, N. *et al.* [California river and flood plain project restores natural processes](#), *American Society of Civil Engineers*. (2022)

⁸ Grenier, L. *et al.* [Advancing Ecosystem Restoration with Smarter Permitting](#). *Public Policy Institute of California*. (2021)

white paper outlines DWR's intent to develop an "R&D Framework" for Flood-MAR to identify pilot projects, the first of which is along the Merced River.

- 3) **Arguments in support.** Several groups write in support, extolling the benefits of flood plain restoration and the need to better prepare for catastrophic floods. "Natural solutions for water management must be considered to protect farmlands and communities as well as ensuring water as a long-term resource in California."
- 4) **Related legislation.** AB 140 (Núñez and Perata), Chapter 33, Statutes of 2006, enacts the Disaster Preparedness and Flood Prevention Bond Act of 2006, which included \$290 million for the protection, creation, and enhancement of flood protection corridors and bypasses through a number of actions including flood plain mapping.

SB 1168 (Pavley), Chapter 346, Statutes of 2014, among other things, states that it is the policy of the state that groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses and sustainable groundwater management is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science.

SB 5 (Machado), Chapter 364, Statutes of 2007, authorizes DWR to develop the BAM displaying 100- and 200-year flood plains for areas located within the Sacramento-San Joaquin by July 1, 2008.

REGISTERED SUPPORT / OPPOSITION:

Support

Climate Action California
Community Alliance with Family Farmers
The Climate Reality Project

Opposition

None on file

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