

### Yolo Bypass System Comprehensive Study 2023 Interim Status Report

Sacramento River, California December 2023

Prepared in Partnership by











The challenges and opportunities associated with the Yolo Bypass System are emblematic of water resource management issues across the Nation. It presents unparalleled opportunities for collaborative planning and integrated implementation of multi-benefit projects to reduce flood risk, restore habitats, improve water quality and water supply, support sustainable agriculture, and increase recreation and regional economic development opportunities.



### **Purpose of the Report**

The U.S. Army Corps of Engineers (USACE) is providing this Interim Status Report (Report) for the Comprehensive Study of the Sacramento River, Yolo Bypass System, California (Comprehensive Study) to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate, as required under Section 209(d) of the Water Resources Development Act (WRDA) of 2020.<sup>1</sup> Since the Comprehensive Study officially began September 25, 2023, this Report will present (1) the current setting for the Yolo Bypass System, including its significance and challenges, (2) the perspectives of the non-federal sponsors and other interested stakeholders concerning comprehensive management of the Yolo Bypass System, and (3) the proposed approach for conducting the Comprehensive Study. A future report will present study findings and recommendations for congressional consideration.

<sup>1</sup> Pub. L. No. 116-260, § 209(d), 134 Stat. 2681-1682, included in Part 2, Division AA of the Consolidated Appropriations Act of 2021 (Pub. L. No. 160-260, Part 2, Div. AA, 134 Stat. 2615 (December 27, 2020)

Aerial view of the Yolo Bypass and the Vic Fazio Wildlife Area looking east toward West Sacramento and downtown Sacramento. Agricultural land within the Yolo Bypass provides multiple benefits to the public – it supports the economy, provides wildlife habitat, and functions as part of the flood protection system.

## Background & Yolo Bypass System Setting

### Background

The Yolo Bypass System is located in northern California, west of the City of Sacramento, and is a feature of the Sacramento River Flood Control Project, which was authorized for construction in Section 2 of the Rivers and Harbors Act of March 1, 1917 (chapter 144; 39 Stat. 949).

The Sacramento River Basin is California's largest, key watershed, and it is integral to a water system that serves the most populous state in the Nation and the fifth-largest economy in the world. The basin also encompasses Sacramento, a critical metropolitan area with one of the highest residual flood risks in the Nation.

For more than a century, federal, state, and local governments and stakeholders have worked continuously to develop water resource management solutions, particularly with regard to flooding, to protect life and property in the region. Local interests constructed levees for flood protection as early as the 1860s. Subsequently, Congress authorized construction of the Sacramento River Flood Control Project, which included the Yolo Bypass System, west of the City of Sacramento, as a flood risk management feature.

These efforts have enabled residential, industrial, commercial, and agricultural communities and businesses to safely develop, grow, and thrive, but these positive changes also call for action to further reduce flood and life safety risk, protect and restore the surrounding wildlife habitats and natural ecosystems, and improve water supply reliability.

With climate change and the need to incorporate resiliency, the complexities of the challenges facing the Sacramento River Basin are only increasing as the State experiences more dramatic swings between catastrophic flooding and mega droughts. Debates about comprehensive management solutions are also occurring within a context where escalating needs for the same land, water, and environmental resources are manifesting themselves within the same geographic region.

Federal, state, local governments, and interested stakeholders now recognize that single-purpose systems first built 100 years ago within the Sacramento River Basin – including the Yolo Bypass System – must be reevaluated and updated to address multiple public benefits simultaneously.

A confluence of interested stakeholders initiated a partnership to explore the potential for more comprehensive water resources management, collaboration, and problem-solving in the Yolo Bypass System. It is a hope of the partnership that success in this region could serve as a model for intergovernmental collaboration for the rest of California and the Nation facing similar pressures and challenges in key watersheds.

Subsequently, Congress authorized a Comprehensive Study in 2020 which will enable the partners to establish a vision of a future system and investigate multiple project purposes (flood risk management, ecosystem restoration, water supply, hydropower, and recreation) for comprehensive management of the Yolo Bypass System. The Comprehensive Study team will engage stakeholders on a broader array of project purposes and develop different products and recommendations over time to address a variety of water resource management challenges.

Congress appropriated \$500,000 in FY2023 to begin work on the study. On September 25, 2023, USACE signed a Feasibility Cost Share Agreement with the two non-federal sponsors: State of California Central Valley Flood Protection Board (CVFPB), and Sacramento Area Flood Control Agency (SAFCA).

### **Yolo Bypass System Setting**

### Location

Situated between the Fremont Weir in the north and the Sacramento-San Joaquin Delta (Delta) in the south, the Yolo Bypass is a 40-mile-long federal flood management facility that plays a crucial role in protecting the region from flooding. It is also central to a significant agricultural economy, a critical water supply delivery system, and an ecosystem of national significance. Levees are along the entire eastern extent of the bypass, and along the northern portion of the western extent. The southern bypass on the western side is delineated by high ground. The Yolo Bypass System is operated and maintained by local levee and reclamation districts and the California Department of Water Resources (DWR). These maintenance activities are inspected and monitored by DWR, USACE, and the CVFPB to ensure compliance with federal and state regulations. It conveys flood flows from the Sacramento River by allowing flood flow to enter the bypass through the Fremont and Sacramento Weirs, flooding existing lands currently in agriculture, and public and private wetlands. Upstream of the Yolo Bypass, Sacramento River Basin watershed flows are managed through multiple reservoirs, gates, weirs, and bypasses.



The Yolo Bypass System conveys high flows from the Sacramento River, playing a crucial role in protecting the Sacramento region from flooding.

### History

Prior to the federal investment in flood control, and before extensive settlement in the area (pre-1849), the Yolo Basin was one of many naturally occurring flood basins in the Lower Sacramento River system. The Yolo Basin was primarily natural land, with limited development and high habitat value. It also has a deep history of cultural significance to 13 Native American Tribes.

The native wetlands, riparian forests, and grasslands within the Yolo Basin were converted over time to farms and pastures. As part of the Sacramento River Flood Control Project construction, the levees and weirs of the Yolo Bypass were built to contain the flows in the lowest part of the floodplain and reduce flooding in the adjacent areas. The primary purpose is flood risk management and land use restrictions have been put in place to allow for other uses compatible with periodic flooding, including agriculture, wildlife habitat, and recreation.



Built in 1924 by USACE, the Fremont Weir has been hailed as a simple yet impressive feat in sustainable flood protection and engineering. (Photo 1958).

### Significance

The Yolo Bypass System is the one of the most significant flood risk management features for the Cities of Sacramento and West Sacramento and the heart of the Sacramento River Flood Control Project. Spanning over 59,000 acres, the Yolo Bypass acts as a flood relief valve for the Sacramento River. It conveys 80% of Sacramento River watershed flows during floods, reducing risk to 950,000 people, 284,000 structures, and \$150 billion in critical infrastructure, including urban homes and businesses, the state capital, rural towns, agricultural lands, and numerous disadvantaged communities.

The land in and adjacent to the Yolo Bypass System is comprised of urban, agricultural, and environmental land uses. It produces substantial agricultural, recreational, and ecological goods and services that support the regional economy and culture. Urban lands adjacent to the Yolo Bypass System include the Cities of Sacramento, Davis, Woodland, West Sacramento, and Rio Vista.

The Yolo Bypass serves to address many local, regional, state, and national purposes and priorities, including:

- The Yolo Bypass contains approximately 47,000 acres of agricultural land, making it an important contributor to the nation's food supply and economy. The surrounding counties of Yolo, Solano, and Sacramento have more than 900,000 acres of farmland in production (\$1.5 billion in annual revenues), much of which benefits from flood protection provided by the Yolo Bypass.
- The Sacramento-San Joaquin Delta a designated ecosystem of national importance that includes most of the Yolo Bypass is along the Pacific Flyway and provides critical habitat

for millions of waterfowl. It supports over 500 terrestrial and aquatic species, including culturally significant species like Chinook Salmon, Sandhill Cranes, and endangered and threatened species like the California Least Tern, San Joaquin Kit Fox, and Giant Garter Snake.

- Congress designated the Sacramento-San Joaquin Delta as a National Heritage Area (NHA) in 2019 due to its historical and cultural national significance. The Delta Protection Commission is partnering with the National Park Service (NPS) on grassroots heritage conservation, recreation, and education efforts recognizing the rural, agricultural, multicultural, technological, and recreational heritage of the Delta.
- U.S. Fish and Wildlife Service and National Marine Fisheries Service issued Biological Opinions that included requirements for DWR and the U.S. Bureau of Reclamation to accomplish mitigation in the Yolo Bypass for continued operation of the State Water Project and federal Central Valley Project, which provide drinking water to 25 million Californians and irrigation to 4.5 million acres of agricultural land. (Cache Slough, a tributary to the Yolo Bypass, provides drinking water to over 500,000 residents in Napa and Solano Counties.)
- The Yolo Bypass provides local and regional recreation, tourism, and environmental education opportunities including the Great California Delta Trail; sport fishing; hunting; wildlife viewing; boating; and three wildlife areas managed by the California Department of Fish and Wildlife: Yolo Bypass Wildlife Area, Fremont Weir Wildlife Area, and Sacramento Bypass Wildlife Area.

### Water Resource Challenges

Since Congress authorized the Sacramento River Flood Control Project in 1917, changes in the Sacramento region's physical, hydrological, environmental, and social conditions have prompted calls for modern evaluations of how water resources should be managed to serve a broader array of purposes more compatibly. In particular, today's society expects projects that serve multiple purposes and provide a comprehensive array of benefits.

- Flood & Life Safety Risk. Recent flood risk management studies and projects in the Sacramento River watershed address localized, critical flood risk issues in urban areas such as Sacramento and West Sacramento. Residual flood risks in these areas remain high and flooding threatens residents as well as property and critical infrastructure.
- Climate Change & Resiliency. With climate change increasing the likelihood of extreme flood events, annual lives lost and economic damages in the Sacramento River Basin are projected to increase. Flooding in 2023 caused by nine back-to-back atmospheric rivers striking California is a reminder of how essential it is to invest in flood prevention solutions now, especially in areas where the most vulnerable communities live. According to the Climate and Economic Justice Screening Tool developed by the Council on Environmental Quality, multiple geographic areas within the study area are considered disadvantaged due to their economic status and their projected flood risk. In 2023, FEMA designated an area of Sacramento County that includes many of these communities, like Locke, Walnut Grove, and Hood, as a Community Disaster Resilience Zone due to its high disaster risk and economic need. Climate change will also bring about more extreme droughts, creating opportunities to recommend

flood risk management actions that also support water supply reliability, possibly through groundwater (managed aquifer) recharge.

• Environment. The 59,000 acres of land within this engineered floodway are within the heart of the Pacific Flyway and occupy the previously natural drainage pathways that were home to a mosaic of historic, expansive wetlands, distributary channels, and riparian habitats. Even with recent improvements, the Yolo Bypass restricts fish passage and anadromous fish become stranded in rapidly falling water levels. California's Central Valley has lost approximately 95% of historical wetlands and riparian habitats and more than 90% of historical native anadromous fish-rearing habitat.



The Yolo Bypass is a stop on the Pacific Flyway, providing critical habitat to millions of birds as well as a wide range of other aquatic and terrestrial species.

- Agriculture. Agriculture is the dominant land use in the Yolo Bypass and surrounding areas and is a significant component of both the character and the economy of the region. The long-term sustainability of agriculture may be adversely affected by the conversion of lands to reduce flood risk and achieve ecosystem restoration goals, and also by drought as a result of climate change. The loss of agriculture would diminish the agricultural character of the region and impact the regional economy due to loss of high-value crops and decrease in agricultural production.
- Long-Term Management. Future climate change projections indicate that flood flows will be greater and more frequent, requiring a flood risk management system that is resilient to changing conditions. Faced with limited resources, increasing regulatory constraints, permitting requirements, and changing expectations for the multiple uses of the flood management system, it is increasingly challenging for local agencies to operate and maintain levees and channels.

The challenges and opportunities associated with the Yolo Bypass System are emblematic of water resource management issues across the Nation. It presents unparalleled opportunities for collaborative planning and integrated implementation of multi-benefit projects to reduce flood risk, restore habitats, improve water quality and water supply, support sustainable agriculture, and increase recreation and regional economic development opportunities. No single agency has the authority or expertise to solve all the water resources, environmental, and related economic challenges facing the Yolo Bypass System today. In short, the Yolo Bypass System needs a comprehensive look at the interconnectedness of federal and non-federal actions.

High water flows from the Sacramento River enter the Yolo Bypass at Sacramento Weir and divert around the Sacramento metropolitan area, reducing risk to people and property.

# Partner Perspectives & Regional Engagement

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# Partner Perspectives & Regional Engagement

Interest in the Comprehensive Study and in updated water resource management solutions for the system span federal, state, and local governmental agencies, Native American Tribes, and other interested stakeholders. Collectively, these entities come to the table with their own authorities, policies, practices, and priorities, as well as different funding resources. For those reasons, a durable "partnership" is crucial to the long-term success of any initiative related to the Yolo Bypass.

### **Non-Federal Sponsor Perspective**

The State of California (State) updates the Central Valley Flood Protection Plan (CVFPP) every five years. DWR develops, and the CVFPB adopts, each update of the CVFPP with input from local agency partners. The CVFPP describes the structural and nonstructural actions necessary to reduce flood risk in areas of the Central Valley protected by federally authorized levees that include the State as a non-federal sponsor. The most recent CVFPP update, adopted in 2022, focuses on reducing flood and life safety risk, improving long-term flood system management, and improving climate resilience of the Central Valley flood system. It also identifies actions that protect biodiversity and increase ecological resiliency of the flood system using nature-based solutions.

The CVFPP is developed consistent with the overall policy priorities of the State. Notable water resource policy references for the CVFPP include Governor Gavin Newsom's Water Resiliency Portfolio, the California Water Plan, Executive Order N82-20 (30x30 Initiative), and Senate Bill 369. With these references as a foundation, the CVFPP serves to guide the policy priorities of the non-federal sponsors for this Comprehensive Study as follows:

- Improve Flood System Resilience. Flooding threatens lives, property, the State's water supply system, and critical infrastructure, with potentially severe consequences for the Sacramento region and the Nation. A single point of failure, such as a levee failure, may result in uncontrolled, rapid, and deep flooding. In addition, temperature and precipitation projections indicate that flood flows will be greater and more frequent, necessitating the need for a flood system that is resilient to a changing climate. Consistent with these policies, the non-federal sponsors hope the Comprehensive Study will identify the measures necessary to improve resilience of a flood system facing climate change using the latest climate tools and analytical methods to quantify both economic and life safety risk.
- Protect & Restore Biodiversity. This internationally designated region requires a holistic approach to water resource management to keep plant and animal communities healthy in quickly changing environmental conditions. This includes the Central Valley's elaborate system of rivers, stream, weirs, and bypasses where flood management and water supply objectives must balance with the needs of these same waterways to also support the State's rich biodiversity and unique ecosystems. Consistent with these policies, the non-federal sponsors hope the Comprehensive Study will explore novel nature-based solutions that fully harness the region's network of natural and working lands - including floodplains, wetlands, agricultural lands, and rangelands - to achieve climate resilience and biodiversity goals.
- Enhance Long-Term System Sustainability.
  Flooding, drought resilience, water supply, ecosystem health, water quality, operations and maintenance, and agricultural sustainability

challenges are all interdependent. None can be addressed effectively without considering and addressing the others. The current Yolo Bypass System represents a complete integration of these commonly competing water resource objectives. Consistent with these policies, the non-federal sponsors hope the Comprehensive Study will set the stage to address the entire range of operation, maintenance, and management actions necessary to ensure the long-term sustainability of the envisioned multibenefit water management system.

**Ensure Equity & Environmental Justice.** • Increased involvement and investment are needed to provide underrepresented Californians equitable protection from flooding, access to healthy and diverse ecosystems, resilience to climate change, and a supply of clean and reliable water. Increased equity extends beyond socially and economically disadvantaged communities to other underrepresented communities and tribal nations. Consistent with these policies, the non-federal sponsors hope the Comprehensive Study will explore methods to equitably distribute water resources investments to all underrepresented Californians in the study area.

### Yolo Bypass Cache Slough Partnership Perspective

In the Spring of 2016, 15 public entities co-signed a Yolo Bypass and Cache Slough Memorandum of Understanding (MOU) to confirm their willingness to partner on a new vision for the Yolo Bypass that would address "flood conveyance, fisheries and wildlife habitat, water supply and water quality, agricultural land preservation, economic development, and recreation." This collection of participating public entities comprise what is referred to today as the Yolo Bypass Cache Slough Partnership (Partnership).

### Yolo Bypass Cache Slough Partnership Members

California Department of Fish and Wildlife **California Department of Water Resources** California Natural Resources Agency **Central Valley Flood Protection Board Central Valley Regional Water Quality Control Board** County of Solano County of Yolo **Reclamation District No. 2068** Sacramento Area Flood Control Agency Solano County Water Agency State Water Resources Control Board U.S. Army Corps of Engineers U.S. Bureau of Reclamation U.S. Fish and Wildlife Service **U.S. National Marine Fisheries Service** West Sacramento Area Flood **Control Agency** 

By late 2018, the Partnership had accelerated its organization into an informal but functioning structure that includes various leadership committees and workgroups, with the goal of tackling the multiple public benefits defined in the MOU. The Partnership has made progress in identifying and advancing policy issues related to implementation of the CVFPP in this region. For example, it initiated several workgroups to discuss hydraulic and ecosystem baselines, long-term operations and maintenance, and water quality. There is also

### Yolo Bypass Cache Slough Partnership

"...to partner to improve collaboration, synchronize efforts, and enhance outcomes of planning efforts related to flood conveyance, fisheries and wildlife habitat, water supply and water quality, agricultural land preservation, economic development, and recreation."

an agricultural sustainability workgroup that is working to identify a set of improved tools for addressing agricultural concerns in the region.

The MOU is not legally binding, does not dictate changes to each participating entity's authorities or regulations, and does not mandate funding commitments. Yet, driven by a shared vision, the Partnership has maintained productive dialogue and coordination, culminating in the drafting of a "programmatic framework" and "an integrated approach" to "support implementation of a suite of related projects that collectively provide essential flood conveyance capacity while improving resilience, reliability, and adaptability to climate change; enhance aquatic and terrestrial species habitats; and preserve agricultural land and economic values."

#### **Regional Interest Perspective**

To build ground-up support for implementable projects, DWR funds six regional flood management planning efforts. These plans focus on each region's specific water resource challenges and priorities. The regional plan that encompasses the Yolo Bypass System is the Lower Sacramento **River Delta North Regional Flood Management** Plan. The agencies that routinely meet as a working group are the West Sacramento Area Flood Control Agency, Sacramento Area Flood Control Agency, County of Yolo, County of Solano, Solano County Water Agency, and Reclamation District 2068, all of which are signatories to the Yolo Bypass Cache Slough Partnership MOU. This working group has identified a series of regional priorities that intertwine with the Yolo Bypass Cache Slough Partnership and those of the non-federal sponsors for this Comprehensive Study. USACE and the non-federal sponsors will identify and engage additional regional perspectives as part of the Comprehensive Study.

Aerial view of the Yolo Causeway crossing the Yolo Bypass and the Vic Fazio Yolo Wildlife Area along Interstate 80. In the foreground are massive rice fields that form a valuable wetland habitat to a wide variety of waterfowl.

# Comprehensive Study Approach

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### Comprehensive Study Approach

The Comprehensive Study will explore multi-purpose system adaptation and management through two levels of evaluation. The approach will combine both a comprehensive-level approach and a phased feasibility-level approach to long-term Yolo Bypass System adaptation, improvement, and management.

The study will investigate actions that may be undertaken for the purposes of flood risk management, ecosystem restoration, water supply, hydropower, and recreation and will include the level of analysis necessary to support corresponding recommendations.



The Comprehensive Study will investigate a broad array of project purposes.

As appropriate, screening and evaluation criteria for the comprehensive component of the study, and any feasibility-level recommendations, may include consideration of other purposes in addition to the five specifically authorized by Congress. Relatedly, the study may assess benefits and impacts to those purposes through the following considerations:

- National economic development
- Natural and natural based solutions
- Drought resiliency
- Ecosystem restoration
- Tribes and economically disadvantaged communities
- Equity
- Life safety
- Resiliency

### Comprehensive Study Recommendations

The study authority provides opportunity and direction for USACE to work with the other agencies and entities with an interest in the Yolo Bypass to comprehensively investigate an array of multi-purpose opportunities to improve the management of the system in the future. The study may include, but is not limited to, the following types of recommendations:

- The construction of a water resources development project.
- The structural or operational modification of existing water resources development projects.
- Additional monitoring of, or adaptive management measures to carry out with respect to, existing water resources development projects, to respond to changing hydrologic and climatic

conditions, or geographic areas within the Yolo Bypass System.

 Recommendation of geographical areas within the Yolo Bypass System for additional studies that could lead to the construction of new water resources development projects that complement the existing System's authorized purposes.

The Comprehensive Study will describe readiness of actions for implementation, including a long

term programmatic approach that incorporates phasing and status of actions undertaken through this authority and by others. Consistent with the study authority, any additional feasibility studies carried out pursuant to a recommendation from the Comprehensive Study report will be considered a continuation of the Comprehensive Study authorized under Section 209 of WRDA 2020. In short, the study authority contemplates the potential of a series of studies as future actions come into focus.

### **KEY TAKEAWAY**

The Yolo Bypass System is the heart of the Sacramento River Flood Control Project. Historically, it was the natural place where high waters would flow. Today, the region's inhabitants still depend on the System for safety and security. However, changes in our society, environment, and climate demand that we address more with the Bypass: carry more flood water, provide replacement habitat for native species, and help assure reliable water supplies. The future of California's integrated water resources management depends on bold solutions – solutions that are built on durable partnerships, reliable resources, and sustainable system management.



The Sacramento River, Yolo Bypass System, Comprehensive Study Interim Status Report was prepared in partnership by:







For more information on the Yolo Bypass Comprehensive Study, visit: <u>https://www.spk.usace.army.mil/Missions/Civil-Works/Yolo-Bypass/</u>.