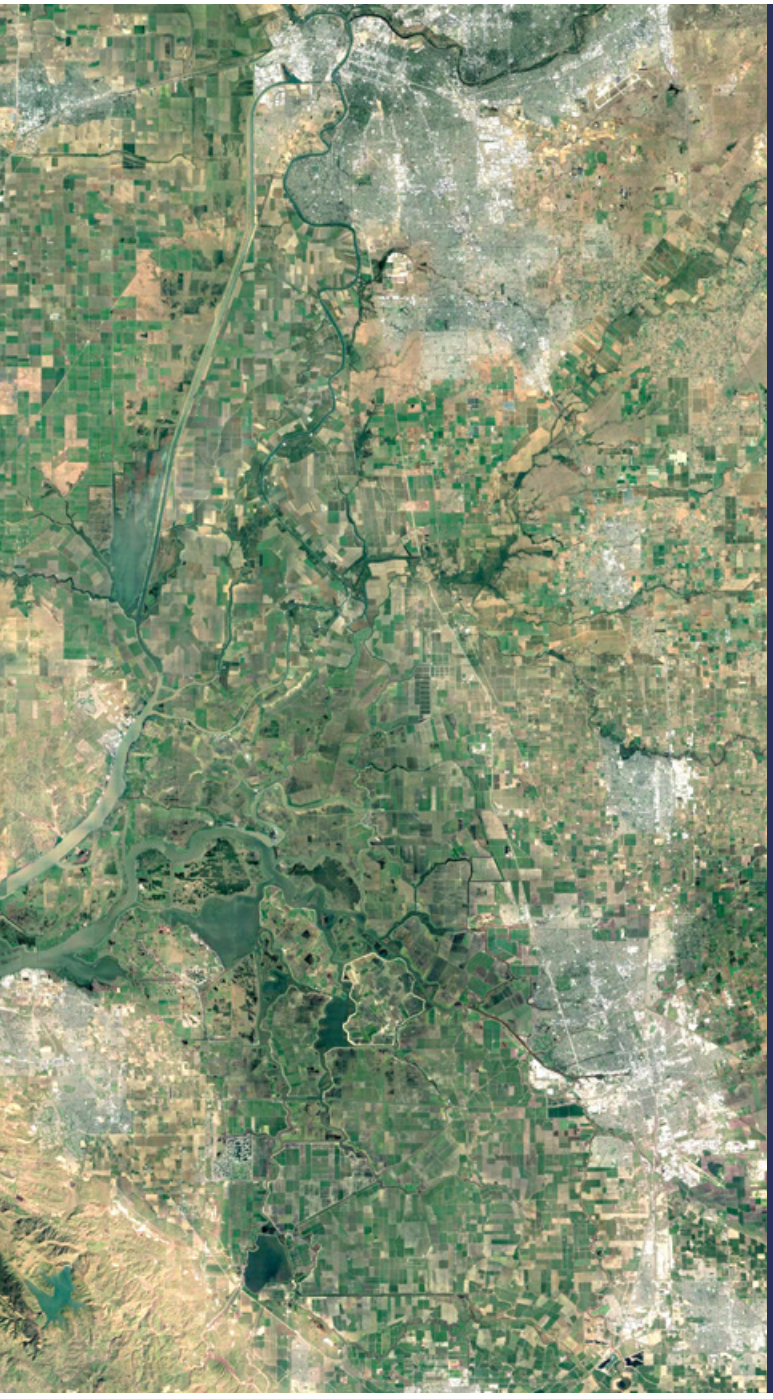

Delta Plan Performance Measures Guidebook

Understanding the Expectations and Metrics for Measures Adopted by the Delta Stewardship Council

September 2023 • *Version 2.0*

Delta Stewardship Council

A CALIFORNIA STATE AGENCY

Acknowledgment

Unless otherwise noted, all photos in this document are courtesy of the California Department of Water Resources.

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Delta Plan Performance Measures

Measuring progress in achieving the coequal goals of a reliable water supply for California and a healthy Delta ecosystem.

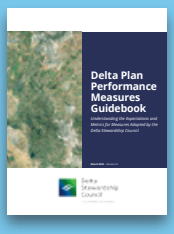
What are the Performance Measures?

Performance measures are critical to implementing the Delta Plan, which is a comprehensive, long-term management plan for the Sacramento-San Joaquin Delta (Delta) and Suisun Marsh required by the Delta Reform Act of 2009. The Delta Plan was first adopted by the Delta Stewardship Council (Council) in 2013 and most recently amended in 2022.

Delta Plan performance measures allow the Council, Delta Plan implementing agencies, stakeholders and the public to track how well the goals and objectives defined in the Delta Plan are being achieved and to detect environmental or administrative changes due to the implementation of policies and recommendations in the Delta Plan.

Relying on science and data monitoring, these measurable indicators are based on numeric targets and include dates to achieve targets as well as baseline conditions against which to evaluate progress.

Delta Plan performance measures allow the Council to integrate science and monitoring results into decision-making, adaptive management, and to track progress towards the coequal goals.



This guidebook provides an overview *of the performance measures adopted by the Council and aims to contribute to a better understanding of the performance metrics and expectations. The status of the Delta Plan performance measures can be viewed online at viewperformance.deltacouncil.ca.gov.*

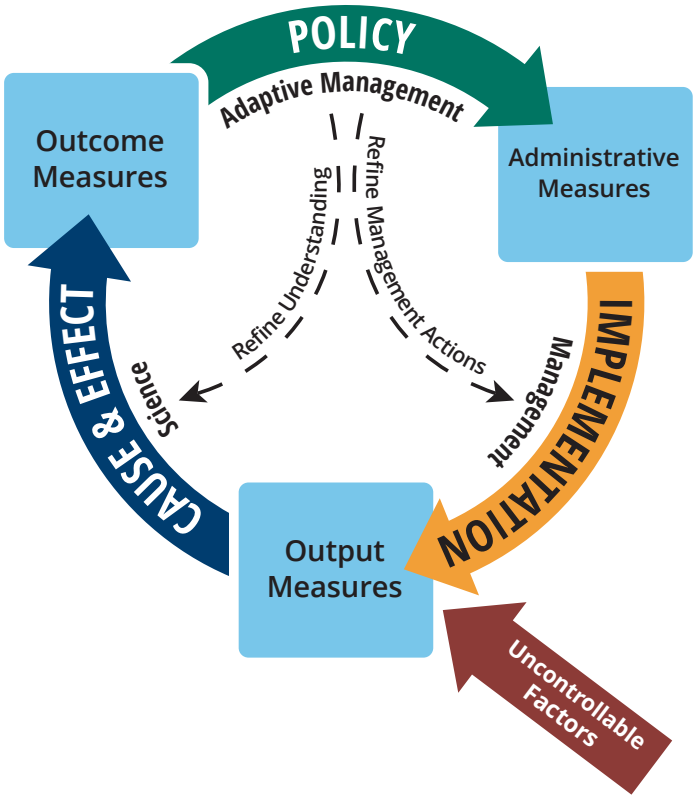
Types of Performance Measures

The Delta Plan identifies three types of performance measures: administrative, output, and outcome.

Administrative performance measures describe decisions made by policymakers and managers to finalize plans or approve resources (e.g., funds, personnel, projects) for implementation of a program or group of related programs. The administrative measures are near-term decisions and consist of actions identified by Delta Plan policies and recommendations. This includes, for example, funding for restoration projects or a habitat restoration plan.

Output performance measures, also known as performance drivers, track results of administrative actions and evaluate factors that may be influencing outcomes. Output performance measures include on-the-ground implementation of management actions, such as acres of habitat restored or acre-feet of water released. This can include, for example, number of restoration projects completed or increased amounts of wetland habitat. Output measures can also include natural phenomena independent from actions in response to Delta Plan policies and recommendations, such as flood, earthquake, or ocean conditions.

Outcome performance measures evaluate system responses to management actions or natural phenomena. Outcome performance measures describe the effects and impacts of management actions upon the system that is being managed, such as restoration of suitable habitat conditions or enhanced ecological functions. Outcome measures are, in many cases, the hardest to measure and assess, yet they are most relevant to the goals and objectives of the Delta Plan. This can include, for example, presence of target species in constructed habitats or increased abundance of native populations.



Administrative, output, and outcome measures are the three types of performance measures used to evaluate implementation of the Delta Plan, track progress toward the coequal goals, and support adaptive management.

How were the Performance Measures Selected?

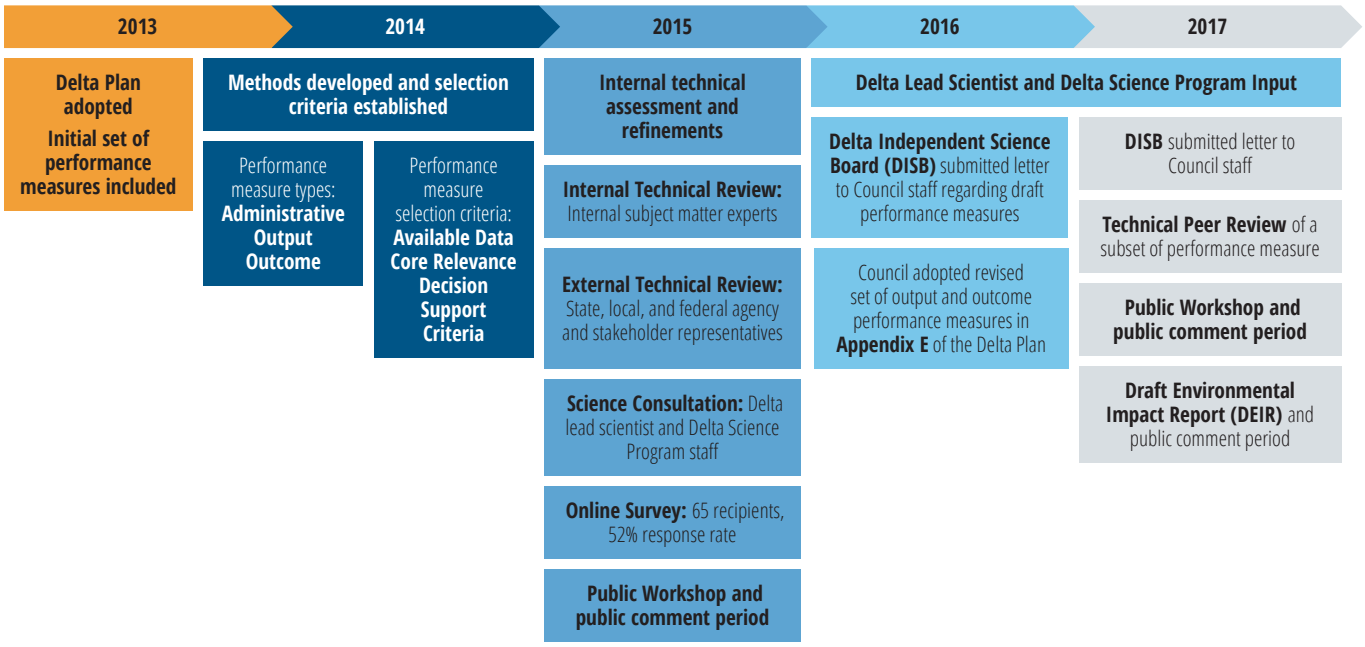
Development of performance measures for a complex and large-scale system like the Delta was a multi-year process that involved state, federal, and local agencies, scientists, and stakeholders. The administrative measures consist of actions contained in the policies and recommendations in the Delta Plan. The output and outcome measures were selected based on "measurable" features that describe important trends and address whether specific actions are producing expected results. Because the output and outcome measures are based on data and available science, leveraging existing data and monitoring efforts was a guiding principle.

Quantitative performance measures were selected using screening criteria. Council staff developed these measures by gathering available information and science, conducting interviews with Delta scientists and managers, and studying other successful practices and frameworks outside of the Delta. The gathering phase included holding outreach meetings, documenting data needs, developing a data collection methodology, and synthesizing source data and datasets. Screening the initial set of potential measures included these criteria/questions:

1. **Available data**—Is the measure viable (e.g., feasible, ready for implementation, and supported by available data)?
2. **Core relevance**—Is the measure relevant to management of the system?
3. **Decision support**—Does the measure support the Delta Plan goals?

Council staff then coordinated technical reviews of the initial set of quantitative performance measures and vetted them through formal outreach processes, including online surveys and public workshops to help ensure opinions of partner agencies, subject matter experts, and public stakeholders were considered.

Development and Refinement Timeline



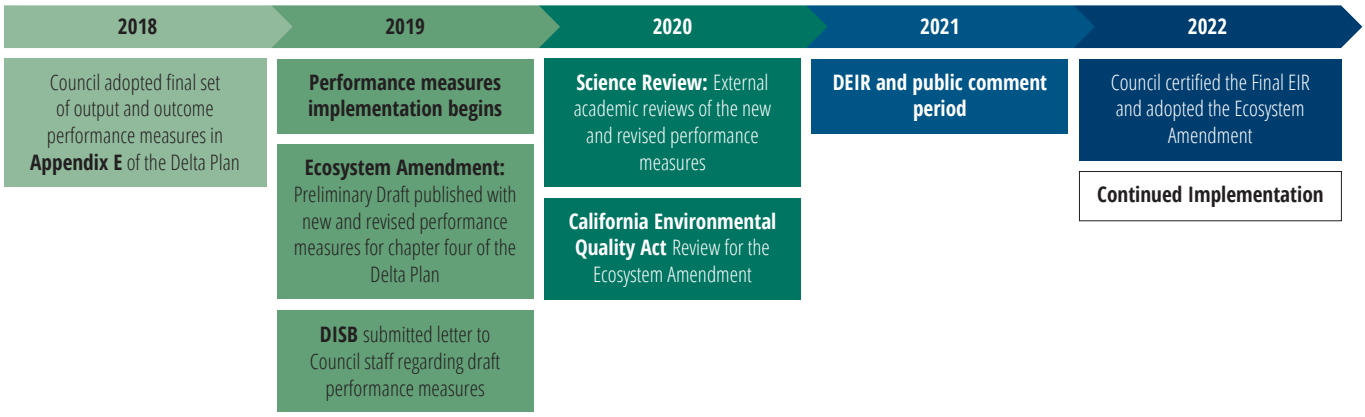
The final set of performance measures was adopted by the Council in 2018 as Appendix E to the Delta Plan (www.deltacouncil.ca.gov) and was followed by the adoption of the revised ecosystem chapter of the Delta Plan in 2022, which included new and revised performance measures. The Performance Measures Dashboard provides access to performance data, information, and current status at viewperformance.deltacouncil.ca.gov.

Why are the Performance Measures Important?

Delta Plan performance measures report the progress in meeting goals and objectives for the Delta and assessments of performance measures contribute to the knowledge of the status of the Delta ecosystem and reliability of statewide water supply.

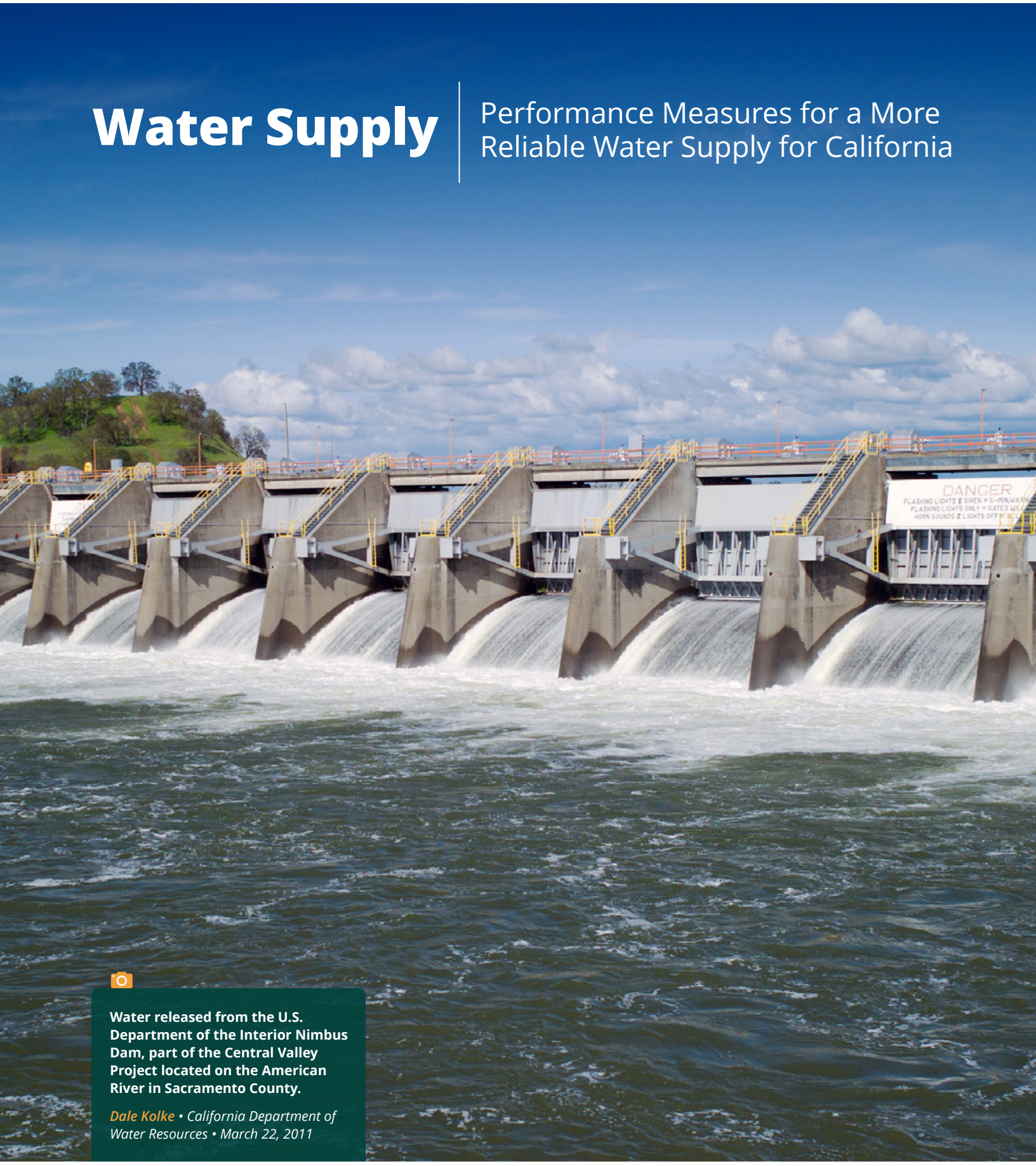
As a result, the Council, the Delta Plan implementing agencies, stakeholders—and the public—can evaluate management actions in both quantitative and qualitative terms.

The performance measures also support government transparency and can be used to enhance collaborations across all managing entities.



Water Supply

Performance Measures for a More Reliable Water Supply for California



Water released from the U.S. Department of the Interior Nimbus Dam, part of the Central Valley Project located on the American River in Sacramento County.

Dale Kolke • California Department of Water Resources • March 22, 2011

Urban Water Use

Urban water suppliers relying on water from the Delta watershed achieve their individual water efficiency targets.

Alternative Water Supply

Urban water suppliers relying on water from the Delta watershed achieve goals for water recycling, storm water capture, and use of advanced water technologies.

Water Supply Reliability

Urban water suppliers relying on water from the Delta watershed demonstrate reliability during single and multiple dry years.

Agricultural Water Planning

Agricultural water suppliers submit an Agricultural Water Management Plan (AWMP) to the California Department of Water Resources (DWR).

Sustainable Groundwater

Responsible state and local agencies complete the 2014 Sustainable Groundwater Management Act (SGMA) mandates.

Water Exports

Water exports from the Delta decrease overall and during critically dry years. Water exports increase during wet years.

OUTPUT PERFORMANCE MEASURE 3.1

Urban Water Use

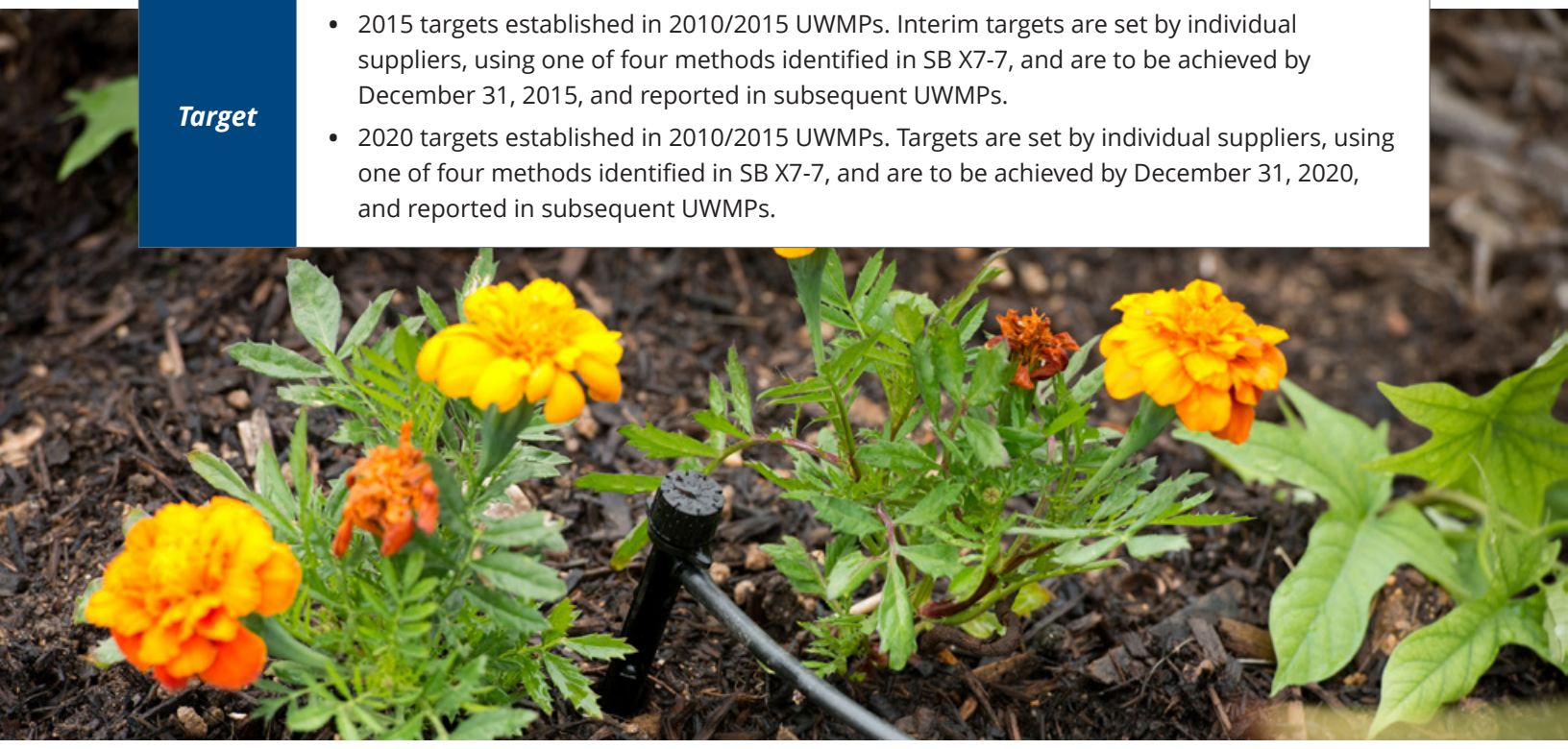
Urban water suppliers relying on water from the Delta watershed achieve their individual water efficiency targets.

Why is this Measure Important?

More efficient urban water use is expected to contribute to maintaining a reliable water supply for California. The state requires most urban water agencies to comply with water efficiency goals established in the California Water Conservation Act of 2009 (SB X7-7). To achieve water efficiency goals, suppliers must meet targets for per capita water use in their supply area. Through water efficiency measures, suppliers can become more resilient and self-reliant. Efficient use of urban water supply supports the Delta Reform Act to reduce reliance on Delta water by reducing individual demand for water and improving regional self-reliance.

Numbers and Goals

Metric	• Gallons per capita per day of urban water use. This will be evaluated at least every five years as Urban Water Management Plans (UWMPs) are updated. • Percentage change in urban per capita water use from SB X7-7 baseline years. This will be evaluated at least every five years as UWMPs are updated.
Baseline	SB X7-7 baselines established in 2010/2015 UWMPs.
Target	• 2015 targets established in 2010/2015 UWMPs. Interim targets are set by individual suppliers, using one of four methods identified in SB X7-7, and are to be achieved by December 31, 2015, and reported in subsequent UWMPs. • 2020 targets established in 2010/2015 UWMPs. Targets are set by individual suppliers, using one of four methods identified in SB X7-7, and are to be achieved by December 31, 2020, and reported in subsequent UWMPs.



ADDITIONAL INFORMATION

California Water Conservation Act of 2009 (SB X7-7) sets a target of reducing urban water consumption in California by 20% by the year 2020. The law was passed during a three-year drought period that showed the need to make water management more efficient. In addition to setting a target for urban water use, the legislation included measures that would support efficiency, such as encouraging the quantification of agricultural water efficiency and adding requirements to UWMPs. Among those new requirements for UWMPs is the calculation of per capita water use by suppliers.

UWMPs are prepared by urban water suppliers every five years to support long-term water resource management. Any urban water supplier in California that provides water to more than 3,000 water connections or provides more than 3,000 acre-feet† of water must prepare a UWMP. The goal of the plan is to ensure that California water supply is not vulnerable due to a lack of long-term resource planning. UWMPs are significant efforts that include planning for supply, demand, and water system improvements. For example, UWMPs require suppliers to quantify existing water supply and demand, and project future demand and supply, and document reduced reliance on Delta water.

UWMPs are supported by the California Department of Water Resources (DWR), who assists water suppliers through workshops and trainings and the UWMP guidebook. DWR reviews individual UWMPs for completeness to ensure water suppliers have addressed legislative requirements. DWR compiles UWMP data and provides it to the public.

† One acre foot of water is the amount of water it would take to cover one acre of land with one foot of water.

A landscape workshop at The Gardens at Heather Farm in Walnut Creek focused on irrigation techniques. The cups in the background are used for measuring the water.

Kelly M. Grow • California Department of Water Resources • June 25, 2014

OUTPUT PERFORMANCE MEASURE 3.2

Alternative Water Supply

Urban water suppliers relying on water from the Delta watershed achieve goals for water recycling, storm water capture, and use of advanced water technologies.

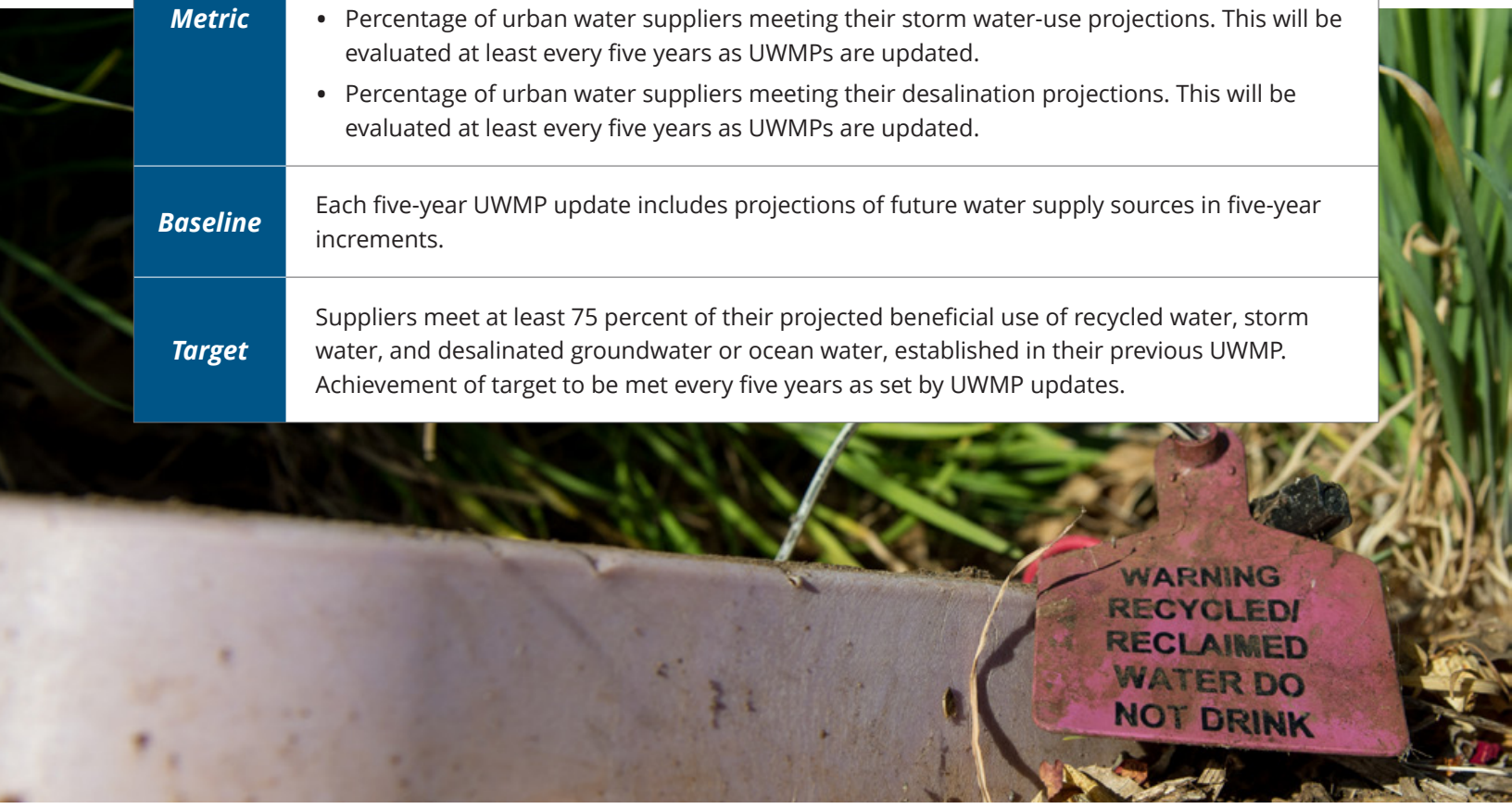
Why is this Measure Important?

Urban water suppliers are required to submit plans to the California Department of Water Resources (DWR) every five years showing their current sources of water supply, projections of future sources of water supply, and implementation of utilizing alternative water sources. Using alternative sources of local water supply is expected to increase regional water reliability and decrease reliance on the Delta. Recycled water, storm water capture, and desalination are all sources of alternative water supply.

A diverse portfolio of alternative local water sources contributes to a more reliable water supply for California.

Numbers and Goals

Metric	• Percentage of urban water suppliers meeting their recycled water projections. This will be evaluated at least every five years as Urban Water Management Plans (UWMPs) are updated. • Percentage of urban water suppliers meeting their storm water-use projections. This will be evaluated at least every five years as UWMPs are updated. • Percentage of urban water suppliers meeting their desalination projections. This will be evaluated at least every five years as UWMPs are updated.
Baseline	Each five-year UWMP update includes projections of future water supply sources in five-year increments.
Target	Suppliers meet at least 75 percent of their projected beneficial use of recycled water, storm water, and desalinated groundwater or ocean water, established in their previous UWMP. Achievement of target to be met every five years as set by UWMP updates.



OUTCOME PERFORMANCE MEASURE 3.4

Water Supply Reliability

Urban water suppliers relying on water from the Delta watershed demonstrate reliability during single and multiple dry years.

Why is this Measure Important?

A reliable water supply is necessary to meet California's current and future needs for water. California experiences routine droughts. During drought years there will be increased demand for scarce Delta water if suppliers are not prepared to meet local demand during dry years. Reliability can be achieved through increased use of alternative supplies, demand management, or both.

Urban water suppliers demonstrate that they are able to provide a reliable service during single and multiple dry years. Dry year reliability is based on water supply available during a supplier's historically driest years. The Urban Water Management Plans (UWMPs) must include an estimate of service changes during the historic driest three years and if necessary must identify a mechanism for limiting water demand during those three years (Water Code section 10632). Tracking projected reliability in UWMPs provides information on urban water suppliers' performance related to dry year water supply reliability.

Numbers and Goals

Metric	• Percentage of urban water suppliers that are within the Delta watershed, or those relying on water from the Delta watershed, projecting reliability during a single dry year (i.e., lowest water supply available to the agency for a single year). This will be evaluated at least every five years as UWMPs are updated. • Percentage of urban water suppliers that are within the Delta watershed, or those relying on water from the Delta watershed, projecting reliability for multiple dry years (i.e., lowest water supply available to the agency for three consecutive years). This will be evaluated at least every five years as UWMPs are updated.
Baseline	• Percentage of urban water suppliers that are within the Delta watershed, or those relying on water from the Delta watershed, projecting reliability during a single dry year in their 2015 UWMPs. • Percentage of urban water suppliers that are within the Delta watershed, or those relying on water from the Delta watershed, projecting reliability for multiple dry years in their 2015 UWMPs.
Target	One hundred percent of urban suppliers that are within the Delta watershed, or those relying on water from the Delta watershed, project shortages no greater than 20 percent during single and multiple dry years by 2020—taking into account the reduced availability of water from the Delta watershed during dry years.

ADMINISTRATIVE PERFORMANCE MEASURE 3.6

Agricultural Water Planning

Agricultural water suppliers submit an Agricultural Water Management Plan (AWMP) to the California Department of Water Resources (DWR).

Why is this Measure Important?

Agricultural water suppliers are expected to comply with water planning and measurement laws, and to submit their AWMPs to DWR every five years as required by the California Water Conservation Act of 2009 (SB X7-7). Agricultural water supplies are to report annually on aggregated water deliveries to farms.

The Water Conservation Act of 2009 contains several important provisions regarding agricultural water use. It requires agricultural water suppliers to measure the volume of water delivered to their customers, adopt a pricing structure based on the quantity delivered, and develop an AWMP. The Water Conservation Act of 2009 also directed DWR to develop and report to the Legislature a proposed methodology for quantifying the efficiency of agricultural water use.

Numbers and Goals

Metric	• Percentage of AWMPs submitted to DWR on time. This will be evaluated every five years as AWMPs are updated. • Percentage of AWMPs submitted to DWR that include a quantification of water use efficiency. This will be evaluated at least every five years as AWMPs are updated.
Baseline	• Fourteen percent of the required AWMPs (8 of the estimated 56) were submitted to DWR on time for the 2012 cycle. Thirty-seven percent of required AWMPs (35 of the estimated 95) were submitted to DWR on time for the 2015 cycle. • Zero percent of AWMPs (0 of the estimated 56 required) submitted to DWR for the 2012 cycled included a quantification of water use efficiency improvements.
Target	• By 2020, 100 percent of AWMPs are submitted to DWR on time. • By 2020, 100 percent of AWMPs submitted to DWR include a quantification of water-use efficiency.

ADMINISTRATIVE PERFORMANCE MEASURE 3.8

Sustainable Groundwater

Responsible state and local agencies complete the 2014 Sustainable Groundwater Management Act (SGMA) mandates.

Why is this Measure Important?

The 2014 SGMA addresses chronic groundwater overdraft throughout California. Groundwater overdraft occurs in regions that also rely upon water from the Delta watershed. Actions to ensure long-term sustainability of the groundwater are also essential to local self-reliance and improved reliability in regional water supply.

The SGMA mandates that Groundwater Sustainability Plans (GSPs) be adopted by local Groundwater Sustainability Agencies in 2020 and 2022. The performance measure tracks the implementation of SGMA and adoption of groundwater sustainability goals. After GSPs are completed, the performance metric will be updated to track the metrics included in GSPs and targets set for groundwater basins that rely on water from the Delta watershed.

Numbers and Goals

Metric	Completion of actions required by SGMA. This will be evaluated annually until GSPs are completed.
Baseline	Not available
Target	The actions required by SGMA have various target dates. 100 percent of actions required by SGMA are completed by their target dates.

ADDITIONAL INFORMATION

The SGMA includes a key principle of solving problems on the local level. SGMA mandates: "to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible, while minimizing state intervention to only when necessary to ensure that local agencies manage groundwater in a sustainable manner."

Groundwater Sustainability Agencies (GSAs) are required to adopt sustainability goals for the maximum amount of groundwater withdrawn annually without causing an undesirable result. Undesirable results of chronic groundwater overdraft include: chronic lowering of groundwater levels, reduction in groundwater storage, seawater intrusion, degradation of water quality, land subsidence, and impacts on beneficial uses of surface water.

For each of these undesireable results, GSPs are required to include:

1. Minimum thresholds: numeric values to define undesirable results;
2. Measurable objectives: specific, quantitative goals to achieve sustainability for the basin by 2040; and
3. Interim milestones: incremental five-year targets leading to achievement of the measurable objective.

OUTCOME PERFORMANCE MEASURE 3.9

Water Exports

Water exports from the Delta decrease overall and during critically dry years. Water exports increase during wet years.

Why is this Measure Important?

Many water suppliers in California rely on water exported from the Delta through the Central Valley Project (CVP) and State Water Project (SWP). However, reliance on the Delta for water supply means greater pressure on the Delta ecosystem. Water availability for exports and the Delta ecosystem is driven by climate and hydrological variability, and is vulnerable to climate change and catastrophic event impacts.

Managing Delta exports based on the amount of water available in the system can benefit the ecosystem. Specifically, exports during critically dry years have a greater chance of conflicting with the Delta's aquatic ecosystem. During critically dry years, the Delta experiences lower inflows to support its natural communities. During wet years, Delta inflow is higher and many aquatic species are less stressed by exports.

In addition, an overall reduction in water exports is expected in response to overall decrease in water available under changing climate conditions and sea level rise projected for California.

ADDITIONAL INFORMATION

The SWP are complex water systems that provide water supply, flood protection, and hydroelectric power to California. The CVP is operated by the federal government while the SWP is operated by the state of California. Central to both systems is water exported from the Sacramento-San Joaquin Delta to water suppliers across California. Water exported from the Delta is used for more than 27 million people and for irrigation of about 3 million acres of farmland. Overall, water exports from the Delta account for about 8 percent of the water used in the entire state (Delta Stewardship Council. 2013. *The Delta Plan.* deltacouncil.ca.gov/delta-plan-0).

In California, the peak of precipitation occurs near the New Year. In order to make it easier to compare water availability between years, California uses "water years," which run from October 1 to September 30. The California Department of Water Resources uses an index to determine if each water year fits into the category of Wet Year, Above Normal, Below Normal, Dry Year, or Critically Dry Year. For the Sacramento Valley, the index uses a formula that accounts for the amount of runoff as well as how wet the previous year was.

Numbers and Goals

Metric	• Total water exported by the State Water Project and the Central Valley Project, during each critically dry year, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta. This will be evaluated following critically dry years. • Total water exported each wet year by the State Water Project and the Central Valley Project, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta. This will be evaluated following wet years. • Fifteen-year average total water exported annually (for all water year types) by the State Water Project and the Central Valley Project, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta. This will be evaluated at least every five years.
Baseline	• Median total water exported during critically dry years by the State Water Project and the Central Valley Project, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta, for the years 1975–2014. • Median total water exported during wet years by the State Water Project and the Central Valley Project, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta, for the years 1975–2014. • Average total water exported annually (for all water year types) by the State Water Project and the Central Valley Project, through the Harvey O. Banks and C.W. Bill Jones Pumping Plants in the southern Delta, for the years 2000–2014.
Target	• A statistically significant decrease in annual total exports during critically dry years as compared to historical deliveries for critically dry years in 1975–2014. This target is to be achieved by 2030. • A statistically significant increase in total exports during wet years compared to historical deliveries for wet years in 1975–2014. This target is to be achieved by 2030. • Fifteen-year average total exports during all year types decreases by 5 percent or more from the average historical deliveries for the years 2000–2014 (5.1 million acre-feet (MAF). This target is to be achieved by 2030.

Delta Ecosystem

Performance Measures for Protecting, Restoring, and Enhancing the Delta Ecosystem

Functional Flows: Yolo Bypass Inundation

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: Yolo Bypass floodplain inundation.

Functional Flows: Peak Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: peak flows in the Sacramento River.

Functional Flows: Recession Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: spring gradual recession flows in the Sacramento River.

Functional Flows: In-Delta Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: in-Delta flow.

Salmon Doubling Goal

Increase Central Valley Chinook salmon population recovery in the Sacramento-San Joaquin Delta with natural production to reach the doubling goal.

Terrestrial and Aquatic Invasive Species

Prevention and reduction of key non-native terrestrial and aquatic invasive species in the Delta and Suisun Marsh.

Subsidence Reversal for Tidal Reconnection

Subsidence reversal activities are located at shallow subtidal elevations to prevent net loss of future opportunities to restore intertidal wetlands through tidal reconnection in the Sacramento-San Joaquin Delta and Suisun Marsh.

Seasonal Inundation

Restore land-water connections to increase hydrologic connectivity and seasonal floodplain inundation.

Fish Passage

Remediate fish passage at priority barriers and select large rim dams in the Delta Watershed; and screen priority diversions along native, anadromous fish migration corridors in the Sacramento-San Joaquin Delta and Suisun Marsh.

Natural Communities Restored

Restore large areas of natural communities to provide habitat connectivity and crucial ecological processes, along with supporting viable populations of native species.

Funding for Restoring Ecosystem Function

Increase funding for projects that possess attributes to restore ecosystem functions and support a resilient, functioning Sacramento-San Joaquin Delta ecosystem

Ground view of the Yolo Bypass and the Vic Fazio Wildlife Area looking east toward West Sacramento and Downtown Sacramento.

The Yolo Bypass, located in the Sacramento Valley, protects Sacramento and other riverside communities from flooding through a system of weirs.

Steve Payer • California Department of Water Resources • March 2009

More Natural Functional Flows

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes.

Why is this Measure Important?

Flow is a major environmental input that shapes ecological processes, habitat, and biotic composition in river and estuary ecosystems, such as the Delta. Native species, by natural selection, are adapted to the seasonal, inter-annual and spatial variability of the historical flow pattern and the functions that come with it. Restoring to a healthier estuary requires using more natural functional flows represented by four performance sub-measures:

A. Inundating floodplains such as the Yolo Bypass stimulates food webs by enhancing phytoplankton growth, triggering aquatic invertebrate production, exporting food downstream, and providing habitat for fish spawning and rearing;

B. Increasing frequency of spring peak flows provides an important function in erosion and deposition processes that create varied instream and riparian habitats and species communities;

C. More gradual recession flows at the end of the wet season improve recruitment of riparian tree species; and

D. Higher in-Delta flows help prevent salinity intrusion in the Delta, thus improving water quality and reliability as well as improving the ecological health of the Delta.

Managing for more natural functional flows means providing the key ecological functions of the flows and restoring the Delta to a healthier estuary.

ADDITIONAL INFORMATION

More natural functional flows means managing for the functions that flows provide to the life history needs of native species within the current conditions of the landscape. For example, winter-run Chinook salmon, a California endangered species, historically survived low summer flows by finding cold-spring creeks in the watershed for spawning. These creeks are now blocked by dams, but cold water can be released from reservoirs to improve spawning habitat downstream. These cold water releases are to replicate the flow function the winter-run Chinook has adapted to. More functional flow is therefore understood to emphasize more natural functions of the flow rather than simply a volume of water. More natural functional flows could include diverting more flow in wet years and less flow in dry years. More natural functional flows would provide species benefits and water supply reliability in the context of current hydrological conditions and degraded habitat. With landscape restoration over time, managing water for functional flows should be adaptively managed as ecosystem conditions change.

OUTCOME PERFORMANCE SUB-MEASURE 4.2A

Functional Flows: Yolo Bypass Inundation

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: Yolo Bypass floodplain inundation.

Why is this Sub-Measure Important?

Yolo Bypass is a large floodplain habitat adjacent to the lower section of the Sacramento River that is frequently flooded and provides alternate routing of flows and young fish through the Delta. Floodplain inundation provides key ecological functions, and restoring more natural functional flow patterns in the Yolo Bypass delivers important ecological benefits to fish in the lower Sacramento River.

The Yolo Bypass has been extensively studied for its potential to contribute to the growth of migratory fish species and contribution to the Delta food web, and has been consistently identified as a high-opportunity area for providing floodplain and wetland functions. Native fish species such as Chinook salmon, steelhead, and Sacramento splittail accessing inundated habitat of the Yolo Bypass have higher growth rates and consequently increased survival rates. Juvenile fish migrating downstream through the Yolo Bypass also keep away from the southern Delta where mortality rates are higher. Food production (phytoplankton and zooplankton) and juvenile fish growth generally increase with increased floodplain inundation duration, although there is uncertainty as to the time period and frequency of inundation that provide maximum ecological benefits to the fisheries. Current collaborative and adaptive management efforts will provide additional information to guide the restoration of more natural flow patterns in the Yolo Bypass.

Numbers and Goals

Metric	Area and duration of inundation in the Yolo Bypass, evaluated annually on a five-year rolling basis.
Baseline	Modeling for the years 1997–2012 estimates that events with a 14-day duration inundated 45,100 acres in 33 percent of years, 19,700 acres in 50 percent of years, and 16,400 acres in 67 percent of years. Events with a duration of at least 21 days are estimated to have covered 36,300 acres in 33 percent of years, 15,800 acres in 50 percent of years, and 10,000 acres in 67 percent of years, between November 1 and May 30 (DWR 2015).
Target	By 2030, allow for at least 17,000 acres of inundation for at least 14 days in two out of three years and at least 21 days in one out of two years, between November 1 and March 15.

Photo courtesy of Carson Jeffres.

OUTCOME PERFORMANCE SUB-MEASURE 4.2B

Functional Flows: Peak Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: peak flow in the Sacramento River.

Why is this Sub-Measure Important?

Large magnitude peak flow in the spring (also referred to as "pulse" flow) is an important component of functional flows and has wide-ranging positive effects on ecosystems. Spring peak flows are important for many native species in and along the Sacramento River, and within the Sacramento-San Joaquin Delta. Spring peak flows help inundate floodplains, thereby providing suitable habitat for many native migratory fish species. Periodic high flows also provide important channel forming functions, including sediment transport and river bank erosion and deposition. A dynamic river channel creates varied channel and riparian habitats supporting diverse riparian species communities. For example, channel bank erosion supports recruitment of Fremont cottonwood and creates habitat for bank swallow.

Numbers and Goals

Metric	Frequency of two-year return interval peak flows between November 1 and April 30, evaluated annually on a five-year rolling basis, at Bend Bridge on the Sacramento River.
Baseline	Hydrograph data for the Bend Bridge gage station (USGS gage 11377100) indicate that the magnitude of flow for pre-Shasta Dam (1891–1943) and post-Shasta dam (1960–2013) events with 14-day duration are similar (approximately 20,000 cubic feet per second, CFS). However, the pre-Shasta Dam historical 1.5-year recurrence interval peak flow event (approximately 75,000 CFS) now occurs approximately every two years, and the pre-Shasta Dam 10-year recurrence interval flow (206,200 CFS) has been nearly halved (133,842 CFS).
Target	By 2030, at least one peak flow greater than 75,000 CFS and lasting at least 48 hours in duration, every two years, at Bend Bridge on the Sacramento River.

OUTCOME PERFORMANCE SUB-MEASURE 4.2C

Functional Flows: Recession Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flows—to support ecological floodplain processes: spring gradual recession flows in the Sacramento River.

Why is this Sub-Measure Important?

California streams and rivers decrease their flows in the spring during the end of the wet season. Gradual spring recession flow has wide-ranging effects on ecosystem health in California rivers and is an important component of functional flows. Gradually receding flows are important for avoidance of stranding of native fish and amphibians, success of many invertebrates that are prey to native fish, and establishment of key riparian plant species.

Appropriate recession flows are critical for establishment of riparian tree species such as Fremont cottonwood, Gooding's black willow, and sandbar willow. These trees help stabilize stream banks, produce debris that provides habitat for fish, and provide erosion control and shade.

Recession flow serves as a proxy for drawdown of the water level such that riparian tree species can access water and become established. Modeling indicates that rapid drawdown of up to approximately a week may be sustainable if followed by stable flows. Specific recession flows do not necessarily need to occur every year for these important riparian tree species.

Numbers and Goals

Metric	Rate of change in the hydrograph on the receding limb as measured from spring high flows to summer low flows, evaluated annually and on a five-year rolling basis, at Bend Bridge on the Sacramento River.
Baseline	Long-term hydrograph data from US Geological Survey gage station at Bend Bridge (USGS 11377100).
Target	By 2030, daily decrease in flow will be less than 3.5 percent per day, as calculated by a five-day rolling average during the period of spring flow recession, in at least one out of five years, at Bend Bridge on the Sacramento River.

Photo courtesy of Carson Jeffres.

OUTCOME PERFORMANCE SUB-MEASURE 4.2D

Functional Flows: In-Delta Flow

Restoring to a healthier estuary using more natural functional flows—including in-Delta flows and tributary input flow—to support ecological floodplain processes: in-Delta flow.

Why is this Sub-Measure Important?

Flows though the interior of the Delta, represented by the ratio of outflow from the Delta to the inflow into the Delta, are an important component of functional flows and have wide-ranging effects on the health of the Delta and the lower San Francisco Bay Estuary. The ratio of Delta outflows to inflows encompasses a vast array of flow and ecological complexity, and is relevant to in-Delta flow patterns, including the overall quantity, timing, and variability of flow regimes. Variability of flows between years is very high in California, therefore, a ratio is used to account for different water year types. A higher outflow to inflow ratio contributes to restoring a more natural functional flow patterns in the Delta.

Over the past century, land use change, construction of large-scale water management infrastructure, export of water, in-Delta diversions, and consumptive water use have greatly changed flow dynamics in the Delta. Several rivers, creeks, and other water bodies contribute water to the Delta, the largest of which are the Sacramento and San Joaquin rivers. Freshwater inflow into and through the Delta greatly influences the ecological health of the Delta, as well as water quality and species abundances. Studies continue to evaluate ecosystem responses to Delta flows and how flow, non-flow and other factors interact to impact specific species. The State Water Resources Control Board adopts and implements the Bay-Delta Water Control Plan to manage water flows in the San Joaquin River watershed and the Sacramento River watershed. These efforts link flow objectives with non-flow objectives, such as improving habitat restoration, fish passage, and predator control.

Numbers and Goals

Metric	(1) 10-year rolling average slope of the Delta outflow-inflow ratio, disaggregated by seasonal, annual, and 10-year periods, (2) outflow-inflow ratio in dry and critically dry years, evaluated annually on a five-year rolling basis.
Baseline	Long-term ratio of Delta outflow to Delta inflow. The period before construction of the Central Valley Project and State Water Project and select major dams (1931–1954) had a Delta outflow-inflow ratio of 0.88. Post-completion of most components of the State Water Project (1981–2015) the Delta outflow-inflow ratio was 0.75.
Target	By 2030, (1) 10-year rolling average slope of Delta outflow-inflow ratio is greater than zero (i.e. positive), and (2) Annual average Delta outflow-inflow ratio in dry as well as in critically dry years is greater than 0.5.

Aerial view of the Sacramento River. *Steve Mararano • U.S. Fish and Wildlife Service • February 2017*

OUTCOME PERFORMANCE MEASURE 4.6

Salmon Doubling Goal

Increase Central Valley Chinook salmon population recovery in the Sacramento-San Joaquin Delta with natural production to reach the doubling goal.

Why is this Measure Important?

The Delta serves as a migration corridor for Central Valley salmon runs and critical rearing habitat for young salmon while they migrate to the ocean. Salmon are native anadromous fish and a vital indicator species of ecosystem health and the effectiveness of habitat restoration and water quality improvement projects. In addition to ecological importance, salmon have sociocultural significance to many Native American communities. Central Valley Chinook is also an integral part of California's fishing industry. The Central Valley Project Improvement Act (CVPIA), enacted by the U.S. Congress in 1992, requires improvements to water management to protect fish and wildlife, including achieving the State and federal doubling goal for Central Valley Chinook salmon natural production (fish produced from eggs to adulthood without direct human intervention in the spawning, rearing, or migration processes) relative to 1967–1991 levels.

Salmon populations depend on various factors, such as the suitability of spawning and rearing habitat in the rivers, predation in the Delta, and food availability in the ocean. Extensive drought periods contribute to decreased salmon natural production levels due to the lack of cold water needed in spawning habitats and poor food availability. Management of water operations, habitat restoration, reconnecting migratory routes, and increased agency coordination in the Delta can help contribute to the salmon doubling goal and to improve the adaptive capacity of salmon to respond to climate change.

Numbers and Goal

Metric	Annual average natural production of all Central Valley Chinook salmon runs and for individual run types on select rivers: fall, late fall, spring, and winter. Census will be conducted annually for the general population in the Central Valley and select rivers.
Baseline	Set by the CVPIA, the baseline is the 1967–1991 Chinook salmon natural production annual average of 497,054 for all Central Valley runs. In addition, for individual run types on select rivers, the baseline values are specified in Table 1. ***Central Valley Chinook Salmon Natural Production Baseline and Target Levels by Run Type and Selected Rivers.***

Target

The 15-year rolling annual average of natural production for all Central Valley Chinook salmon runs increases for the period of 2035–2065 and reaches 990,000 fish by 2065.* For each run on select rivers, the target values are specified in Table 1.

Table 1. ***Central Valley Chinook Salmon Natural Production Baseline and Target Levels by Run Type and Selected Rivers.***

Baseline (1967–1991) Sacramento River Watershed	**Baseline (1967–1991) San Joaquin River Watershed**	**Target (2065) Sacramento River Watershed**	**Target (2065) San Joaquin River Watershed**
Sacramento River mainstem: • Fall-run: 115,369 • Late fall-run: 33,941 • Spring-run: 29,412 • Winter-run: 54,316	Tuolumne River • Fall-run: 18,949	Sacramento River mainstem: • Fall-run: 230,000 • Late fall run: 68,000 • Spring-run: 59,000 • Winter-run: 110,000	Tuolumne River • Fall-run: 38,000
American River • Fall-run: 80,874	Merced River • Fall-run: 9,005	American River • Fall-run: 160,000	Merced River • Fall-run: 18,000
Feather River • Fall-run: 86,028	Stanislaus River • Fall-run: 10,868	Feather River • Fall-run: 170,000	Stanislaus River • Fall-run: 22,000
	Mokelumne River • Fall-run: 4,680		Mokelumne River • Fall-run: 9,300

* The targets in Table 1 do not add up to the target for all runs, 990,000 fish, because not all tributaries are included in the table.

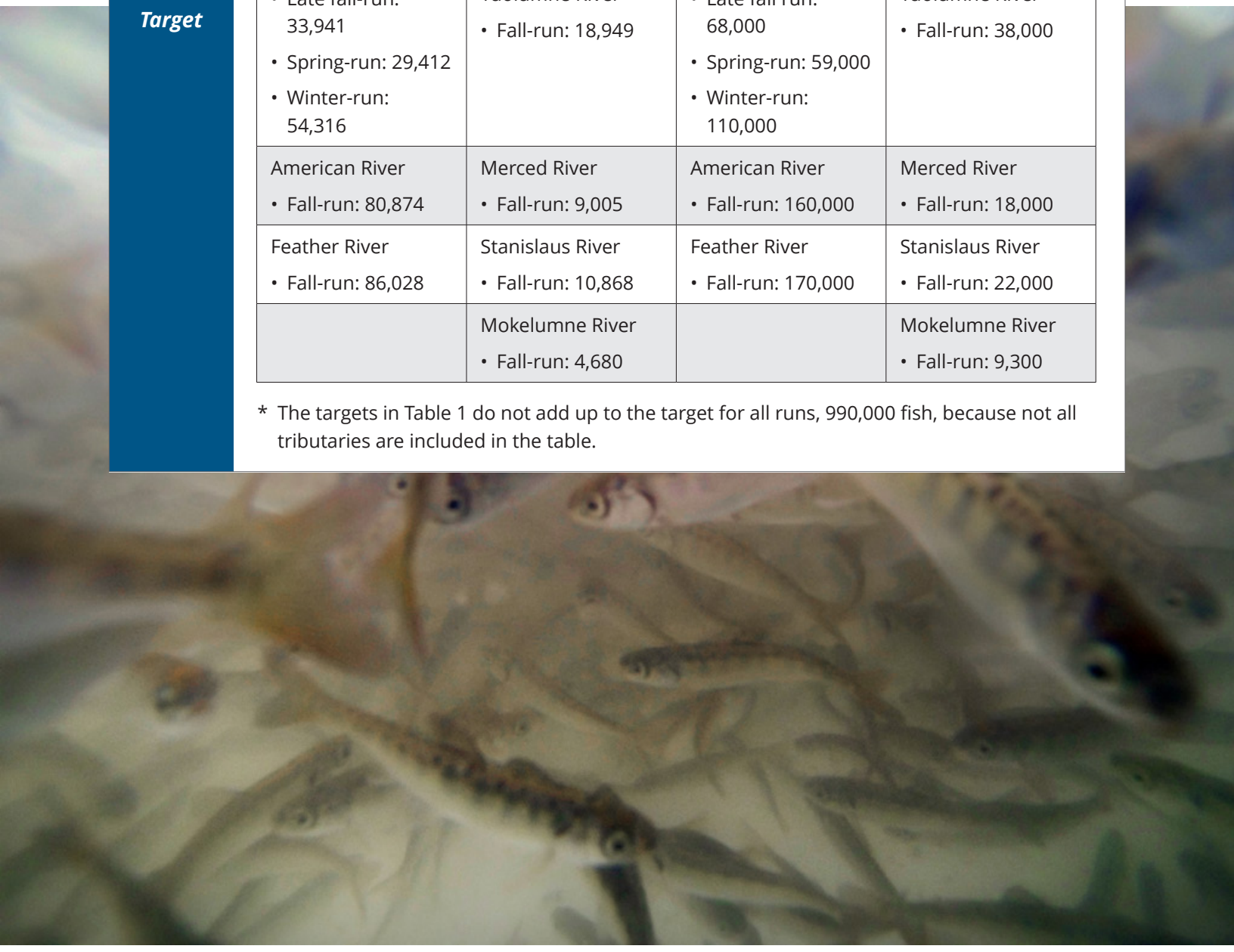


Photo courtesy of Carson Jeffres.

OUTCOME PERFORMANCE MEASURE 4.10

Terrestrial and Aquatic Invasive Species

Prevention and reduction of key non-native terrestrial and aquatic invasive species in the Delta and Suisun Marsh.

Why is this Measure Important?

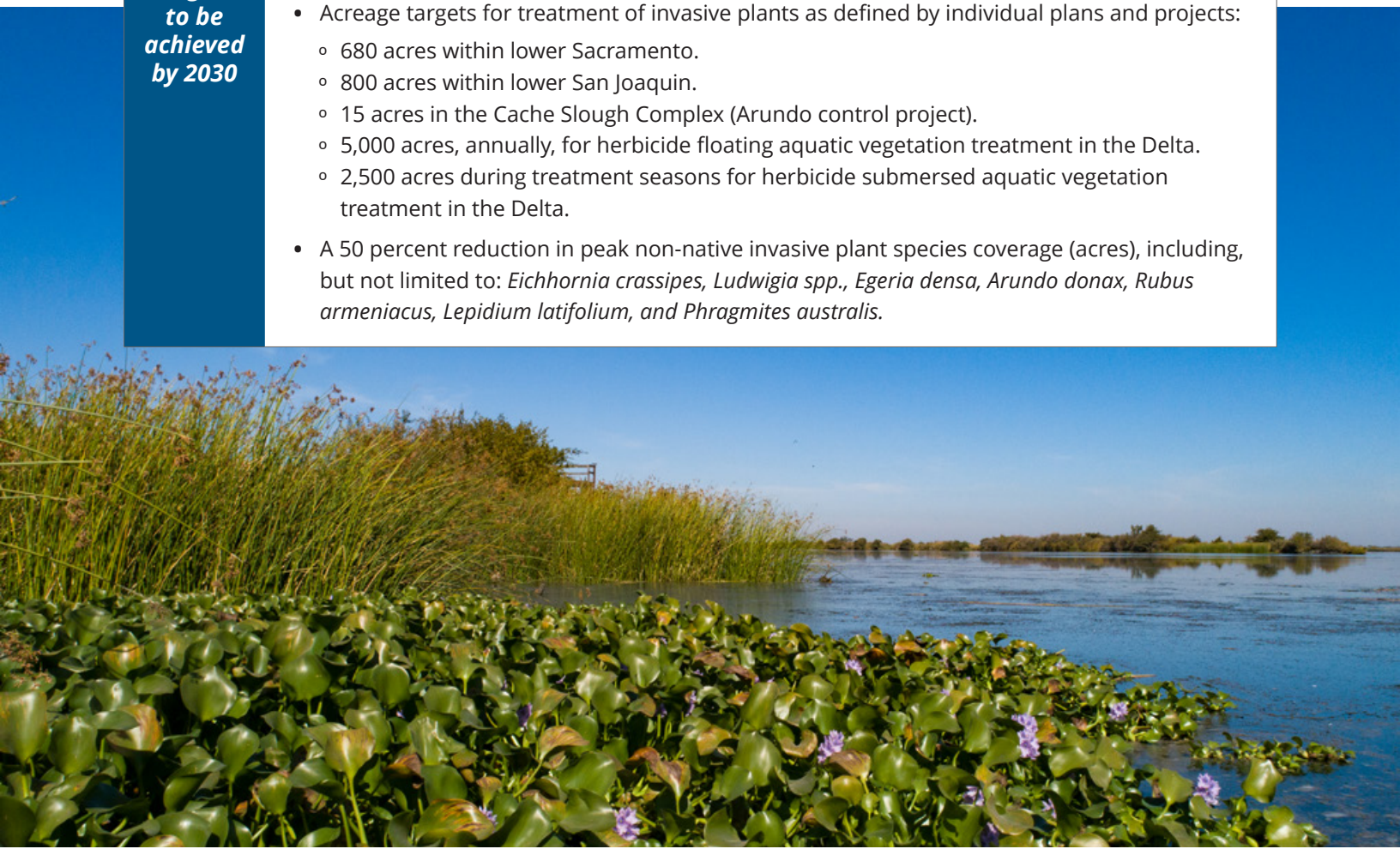
Non-native invasive species are a major stressor to the Delta ecosystem. They affect survival, health, and distribution of native wildlife and plants. Non-native invasive species can take over habitat space, compete for food and nutrients, alter food webs, modify the physical habitat structure, and prey upon native species. This may result in non-native plants, invertebrates, and fish replacing native species. For example, non-native fish are associated with major declines in formerly abundant native fish species because they consume and compete for resources with native fishes. Also invasive aquatic plants have the potential to threaten the health and stability of native fish populations. Submerged and floating non-native vegetation can occur in high densities adversely affecting Delta ecosystem services, local economies, and water infrastructure. During recent drought conditions, invasive floating vegetation increased to unprecedented levels, resulting in boat navigation obstruction, impairment of recreation uses of waterways, and degradation of water quality.

Eradicating established non-native invasive species is not practical, but management can reduce the abundance of some species. The terrestrial and aquatic invasive species measure will track the status of managing non-native invasive species, and help refine future management and restoration actions.

Numbers and Goals

Metric	Number of key new non-native invasive species of fish, plants, and invertebrates establishing populations in the Delta (e.g., Quagga and Zebra mussels, *Hydrilla verticillata,* and others as they are identified). **Managing non-native fish:** • Percentage of the biomass of fish that are native fish species based on U.S. Fish and Wildlife (USFWS) beach seine surveys (and other relevant surveys). • Percentage of total relative abundance that are native species in the Delta and Suisun Marsh based on USFWS beach seine surveys (and other relevant surveys). **Managing invasive non-native vegetation:** • Number of acres treated for invasive plants as defined by individual plans and projects (e.g., Central Valley Flood Protection Plan Conservation Strategy, Arundo control project, Division of Boating and Waterways (DBW) aquatic invasive species control program). • Peak coverage, in acres, of invasive non-native plant species (e.g., *Eichhornia crassipes, Ludwigia spp., Egeria densa, Arundo donax, and Phragmites australis*) in the Delta and Suisun Marsh.

Baseline	Species reported as established in the Delta prior to 2013 Delta Plan adoption will be used for baseline identification of new invasive species establishing post-2013. **Fish:** • Average percent of total fish biomass and abundance that are native fish species based on USFWS beach seine surveys from 1995–2015. **Vegetation:** • Number of acres treated set at zero as of 2013. • Peak coverage estimates, in acres, for nuisance non-native aquatic plant species based on available hyperspectral and Landsat remote sensing surveys conducted in the Delta from 2003–2016. *Arundo donax* surveys conducted for the Delta Conservancy in 2015. Suisun Marsh vegetation surveys conducted from 1999–2013.
Targets to be achieved by 2030	Zero new non-native invasive species of fish, plants, and invertebrates established in the Delta. **Fish:** • 20 percent increase in the biomass of the native inshore fish community, relative to total fish biomass. • 20 percent increase in the relative abundance of the native inshore fish community, compared to total relative abundance. **Vegetation:** • Acreage targets for treatment of invasive plants as defined by individual plans and projects: ◦ 680 acres within lower Sacramento. ◦ 800 acres within lower San Joaquin. ◦ 15 acres in the Cache Slough Complex (Arundo control project). ◦ 5,000 acres, annually, for herbicide floating aquatic vegetation treatment in the Delta. ◦ 2,500 acres during treatment seasons for herbicide submersed aquatic vegetation treatment in the Delta. • A 50 percent reduction in peak non-native invasive plant species coverage (acres), including, but not limited to: *Eichhornia crassipes, Ludwigia spp., Egeria densa, Arundo donax, Rubus armeniacus, Lepidium latifolium, and Phragmites australis.*



OUTPUT PERFORMANCE MEASURE 4.12

Subsidence Reversal for Tidal Reconnection

Subsidence reversal activities are located at shallow subtidal elevations to prevent net loss of future opportunities to restore intertidal wetlands through tidal reconnection in the Sacramento-San Joaquin Delta and Suisun Marsh.

Why is this Measure Important?

Restoration of tidal wetlands requires land at intertidal elevations. Much of the Delta that once supported these intertidal wetlands is now subsided below suitable elevations, preventing opportunities for tidal restoration. Loss of land elevation due to subsidence is ongoing, and, in some portions of the Delta, more than an inch of land elevation may be lost yearly. If subsidence reversal activities are located in places with suitable elevation, the accumulated land can counteract the effects of sea level rise and human-induced subsidence and maintain or increase land elevation. Recovering lost land will also preserve the opportunities for ecosystem restoration through tidal reconnection. Subsidence reversal activities in locations with current shallow subtidal elevations could recover land for tidal restoration and prevent further losses from sea level rise.

Subsidence reversal is a process that increases land elevation by halting soil oxidation and accumulating new soil material. These activities are important conservation actions that can be implemented as multi-benefit projects that support native species and natural communities. Additionally, subsidence reversal projects that are managed wetlands can provide habitat for migratory bird species and support native vegetation communities. After land elevations within the tidal prism are reached, locations can become available for tidal reconnection and tidal wetland restoration that, in turn, benefits aquatic species and native fish populations, while restoring natural geomorphic processes.

In the Delta, shallow subtidal elevations can achieve intertidal elevations through subsidence reversal unless there is extreme sea-level rise. This would prevent the net loss of future opportunities to restore tidal wetlands through the year 2100.

Numbers and Goals

Metric	Acres of Delta and Suisun Marsh land with subsidence reversal activity located on islands with large areas at shallow subtidal elevations. This metric will be reported annually. The average elevation accretion at each project site is presented in centimeters per year. This metric will be reported every five years. Tracking will continue until a project is tidally reconnected.
Baseline	In 2019, zero acres of subsidence reversal on islands with large areas at shallow subtidal elevations. Soils in the Delta are subsiding at a rate of between 0 cm/year and 1.8 cm/year.
Target	By 2030, 3,500 acres in the Delta and 3,000 acres in Suisun Marsh with subsidence reversal activities on islands with at least 50 percent of the area (or at least 1,235 acres) at shallow subtidal elevations. For each project, an average elevation accretion of at least four centimeters per year until the project is tidally reconnected.

OUTPUT PERFORMANCE MEASURE 4.13

Fish Passage

Remediate fish passage at priority barriers and select large rim dams in the Delta Watershed; and screen priority diversions along native, anadromous fish migration corridors in the Sacramento-San Joaquin Delta and Suisun Marsh.

Why is this Measure Important?

The Delta serves as a migration corridor for all anadromous fish species in the Central Valley. Adult salmon migrate through the Delta as they return to the rivers they were born in. Young salmon use the Delta for their outmigration from the upstream rivers to the ocean for rearing and growing. Instream barriers to fish passage and unscreened water diversions impede migratory movements and adversely affect overall species survival. Most fish passage barriers are located upstream in the Delta watershed, where these structures limit or cut off access to spawning grounds and areas of refuge from predation.

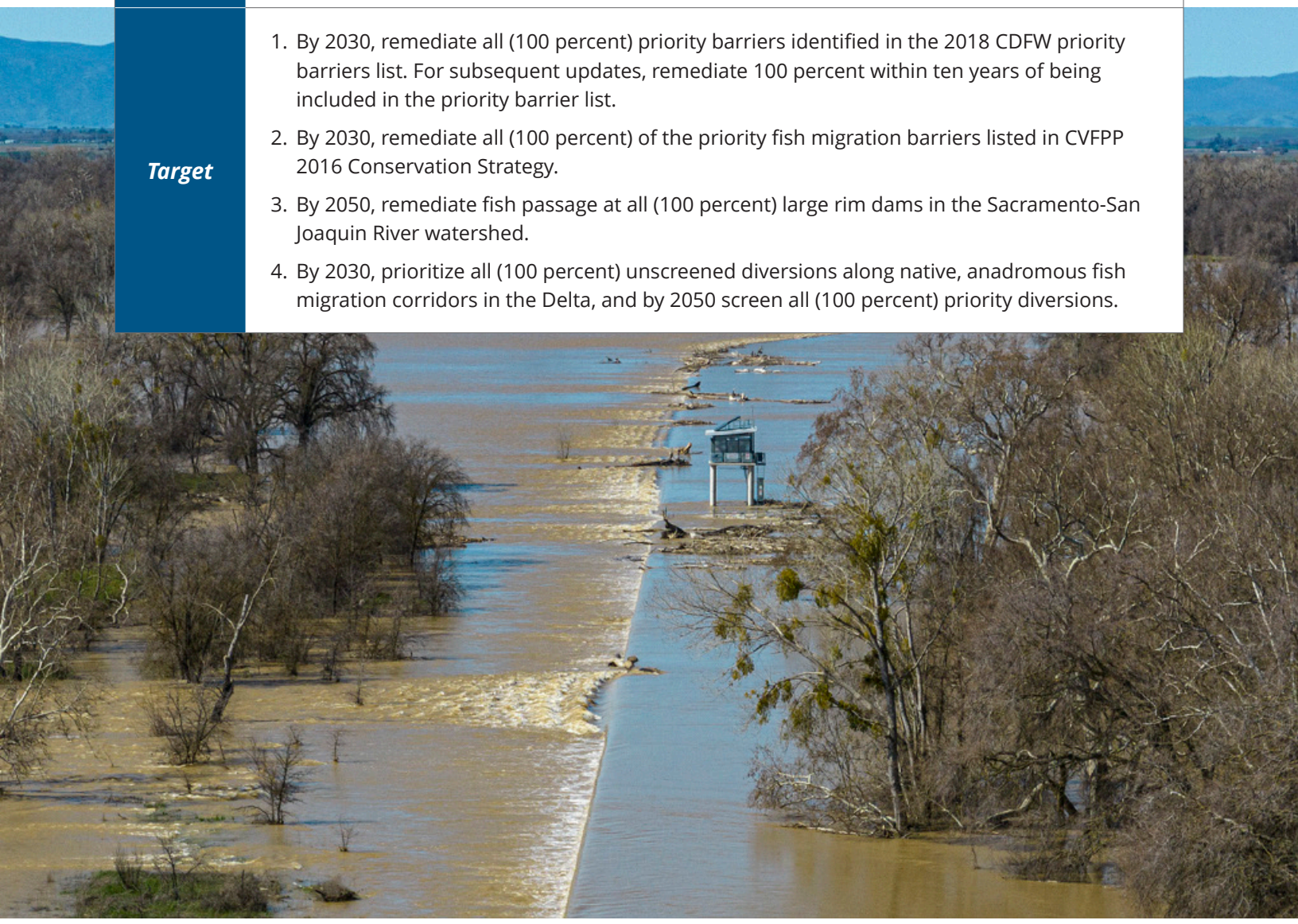
In addition, large dams severely reduce fish access to cold spawning habitat, which is especially valuable because it is located at a higher elevation, influenced by snowmelt, and could provide an important climate refuge as water temperatures rise. It is estimated that the Central Valley rim dams cut off access for salmonids to about 80 percent of their pre-dam-accessible area.

While many fish passage barriers and unscreened diversions are located within the Delta watershed, the California Department of Fish and Wildlife (CDFW) and the California Department of Water Resources (DWR) prioritize the most critical barriers to remediate. Additionally, the National Marine Fisheries Service (NMFS) identifies passage opportunities at Central Valley rim dams that would improve conditions for Central Valley salmon and steelhead populations.

Fish passage remediation means providing upstream and downstream passage to migratory fish by constructing, modifying, or removing barriers. For rim dams, remediation means implementing a long-term passage program that may include capturing, transporting, and releasing fish at different life stages. For unscreened diversions, remediation means screening the diversion so that juvenile and adult fish are physically protected from entrainment. Remediating fish passage barriers throughout the Delta watershed opens in-stream migration corridors, restores aquatic habitat connectivity, and contributes to migratory fish recovery.

Numbers and Goals

Metric	Priority fish passage barriers and select large rim dams in the Sacramento-San Joaquin River watershed, and unscreened diversions along native, anadromous fish migration corridors in the Delta and Suisun Marsh. This metric will be evaluated annually.
Baseline	**Number of fish passage barriers, large rim dams, and unscreened diversions listed in the following:** 1. CDFW 2018 Priority Barriers. 2. Department of Water Resources Central Valley Flood Protection Program (CVFPP) 2016 Conservation Strategy (Appendix K). 3. Large rim dams in the Sacramento–San Joaquin River watershed identified in the National Marine Fisheries Service's Central Valley Recovery Plan for Central Valley Salmon and Steelhead (2014) with recovery actions. 4. Unscreened diversions along Delta native, anadromous migration corridors listed in the Passage Assessment Database (PAD March 2018 version).
Target	1. By 2030, remediate all (100 percent) priority barriers identified in the 2018 CDFW priority barriers list. For subsequent updates, remediate 100 percent within ten years of being included in the priority barrier list. 2. By 2030, remediate all (100 percent) of the priority fish migration barriers listed in CVFPP 2016 Conservation Strategy. 3. By 2050, remediate fish passage at all (100 percent) large rim dams in the Sacramento-San Joaquin River watershed. 4. By 2030, prioritize all (100 percent) unscreened diversions along native, anadromous fish migration corridors in the Delta, and by 2050 screen all (100 percent) priority diversions.



OUTPUT PERFORMANCE MEASURE 4.14

Funding for Restoring Ecosystem Function

Increase funding for projects that possess attributes to restore ecosystem functions and support a resilient, functioning Sacramento-San Joaquin Delta ecosystem.

Why is this Measure Important?

The Delta ecosystem is naturally dynamic due to varying climate and river flows. Therefore, a sustainable Delta ecosystem needs to be large, diverse, and structurally complex to accommodate this variability and sustain native species communities.

A healthy Delta ecosystem requires re-establishing tens of thousands of acres of functional, diverse, and interconnected habitat. Restoration projects need specific attributes to ensure restoration areas provide ecosystem functions and maximize the effectiveness of individual ecosystem protection, restoration, and enhancement projects that support a resilient, functioning Delta ecosystem. These large-scale priority projects restore hydrological and geomorphic processes, improve connectivity, support native vegetation communities, and contribute to the recovery of special-status species. Funding is needed to implement and support these projects and the multiple benefits they offer beyond impact mitigation.

Numbers and Goals

Metric	Project funding of covered actions that file a certification of consistency under Delta Plan Policy ER PA (Disclose Contributions to Restoring Ecosystem Function). This metric excludes funding for projects that do not include protection, enhancement, or restoration of the Delta ecosystem. This metric will be reported annually.
Baseline	Set at zero as of the effective date of Delta Plan Policy ER PA.
Target	By 2030, 80 percent of total funding for covered action projects that file certifications consistent with Delta Plan Policy ER PA is for projects with Ecosystem Restoration Tier 1 or 2 attributes.

ADDITIONAL INFORMATION

Priority Ecosystem Restoration Project Attributes

The Delta Plan sets Policy ER PA requiring proponents of covered actions in the Delta to disclose which priority attributes their project supports. The priority attributes are characteristics of the protection, restoration, and enhancement projects, which best available science indicates are critical to achieving the characteristics of a healthy Delta ecosystem. These priority attributes for ecosystem restoration actions in the Delta are:

- **Restoring Hydrological, Geomorphic, and Biological Processes**—Projects targeting the re-establishment of these processes, also known as process-based restoration, are key to improving habitat characteristics related to habitat patches, vegetation community composition, and habitat requirements for sensitive species.
- **Being Large-Scale**—Projects that cover large areas and longer time frames will increase the chances of creating natural systems capable of sustaining desired functions in uncertain future environmental conditions. Large intact core areas with minimal human intervention are important for facilitating ecological interactions that are important to species persistence.
- **Improve Connectivity**—In the Delta, connectivity means unobstructed flow through the channel system, such as connections between channels and floodplains and connections between surface water and groundwater. Various aspects of connectivity are important in supporting biodiversity in riparian and wetland systems. Improving connectivity will increase ecosystem resilience and the adaptive potential of a rapidly changing climate.
- **Increasing Native Vegetation Cover**—Restoring native vegetation cover is important as a variety of native vegetation can promote ecological resilience and enhance native biodiversity by providing a range of habitat options for species, thus expanding the types and number of species that a landscape can support. Over the last 160 years, the loss of native vegetation cover has greatly reduced habitat complexity in the Delta.
- **Contributing to the Recovery of Special Status Species**—At least 35 native plant species and 86 fish and wildlife species in the Delta are at varying risks of either local extirpation or outright extinction. Habitat loss and degradation, as well as the resulting impacts on food-web dynamics have been a major cause of the at-risk status of these species. Supporting ecosystem functions such as nutrient transfer and primary production is an important requirement for the recovery of these species.

Projects are then designated a Tier number (one to five), depending on which priority attributes the project supports.

Tier 1 projects are projects with all five priority attributes.

Tier 2 projects are projects with priority attribute, Contributing to the Recovery of Special Status Species, and three of the four remaining attributes.

Only Tier 1 and 2 projects are tracked in this performance measure.

OUTPUT PERFORMANCE MEASURE 4.15

Seasonal Inundation

Restore land-water connections to increase hydrologic connectivity and seasonal floodplain inundation.

Why is this Measure Important?

Since the 1800s, about 90% of historical wetland habitat in California has been lost, including 95% of the Central Valley floodplain. In the Sacramento-San Joaquin Delta, most of these wetlands and floodplains have been drained and converted to agricultural land use. Although most of the natural wetlands no longer remain, some agricultural land, floodways, and floodplains can provide similar functions, including increased aquatic food production and transfer of nutrients to the ecosystem. However, for these functions to be maintained or restored, areas must be hydrologically connected via surface water and inundated by water for at least part of the year.

Restoring land-water connections to provide the biological benefits of floodplain inundation requires two components: 1) surface water connectivity for water to flow onto land; and 2) sufficient flow of water to inundate these connected areas.

Numbers and Goals

Metric	**To be evaluated annually, acres within the Delta and Suisun Marsh that are:** 1. Hydrologically connected to fluvial and tidally influenced waterways. 2. A nontidal floodplain area that inundates at least once every two years.
Baseline	**As of the year 2018:** 1. An estimated 75,000 acres of land are physically connected to the fluvial river and tidal system. 2. Approximately 15,000 acres of the connected land were inundated at a two-year interval, calculated as a long-term average for 1985–2018.
Target	**By 2050:** 1. Additional 51,000 acres added to the 75,000-acre baseline that is physically connected to the fluvial river and tidal system, for a total of 126,000 acres. 2. An additional 19,000 acres of nontidal floodplain area is inundated on a two-year recurrence interval for 34,000 acres.

OUTPUT PERFORMANCE MEASURE 4.16

Natural Communities Restored

Restore large areas of natural communities to provide habitat connectivity and crucial ecological processes, along with supporting viable populations of native species.

Why is this Measure Important?

Historically, the Sacramento-San Joaquin Delta and Suisun Marsh supported more than 650,000 acres of natural communities, which are defined by plant community habitat types, including riparian, wetland, and oak savanna. However, more than 90 percent of those ecosystems have been lost through land conversion to agriculture and urban land uses. Re-establishing some of these natural communities on the landscape will provide critical ecological functions, such as aquatic primary production and vegetation community succession, physical space, connectivity, and habitat structure important for native species recovery.

Planning and management efforts, such as recovery plans, species-specific resiliency strategies, and conservation strategies identify specific actions for ecosystem preservation and restoration to meet species' needs. At least 11 recovery and conservation plans exist that have geographic coverage in the Delta and Suisun Marsh. These plans identify restoration and management actions needed to achieve the recovery of 35 species of special-status plants and 86 fish and wildlife species of conservation concern. Nearly half of these species of conservation concern are endemic to California.

Restoring up to 80,000 acres of natural communities, based on recovery and conservation plans, will benefit native and special-status species. Natural community types are classified by plant community structure and physical characteristics, such as hydrology and landscape position.

Restoration of complex ecosystems will require the reestablishment of native vegetation communities. Restoring various native vegetation cover types will promote ecological resilience and native biodiversity. In addition, large areas of natural communities will provide functional, diverse, and interconnected habitats suitable for fish and other wildlife and support the recovery of native species.

Numbers and Goals

Metric	Acres of natural communities restored. This metric will be updated and evaluated every five years.
Baseline	Acres of natural communities from the 2007 Vegetation Classification and Mapping Program (VegCAMP) dataset by the California Department of Fish and Wildlife (CDFW), as designated below:

Ecosystem Type	Baseline Acres (2007 VegCAMP)
Seasonal Wetland Wet Meadow Nontidal Wetland	5,100
Willow Riparian Scrub/Shrub Valley Foothill Riparian Willow Thicket	14,200
Tidal Wetland	19,900
Stabilized Interior Dune Vegetation	20
Oak Woodland	0
Grassland	33,000
Vernal Pool Complex	5,100
Alkali Seasonal Wetland Complex	700

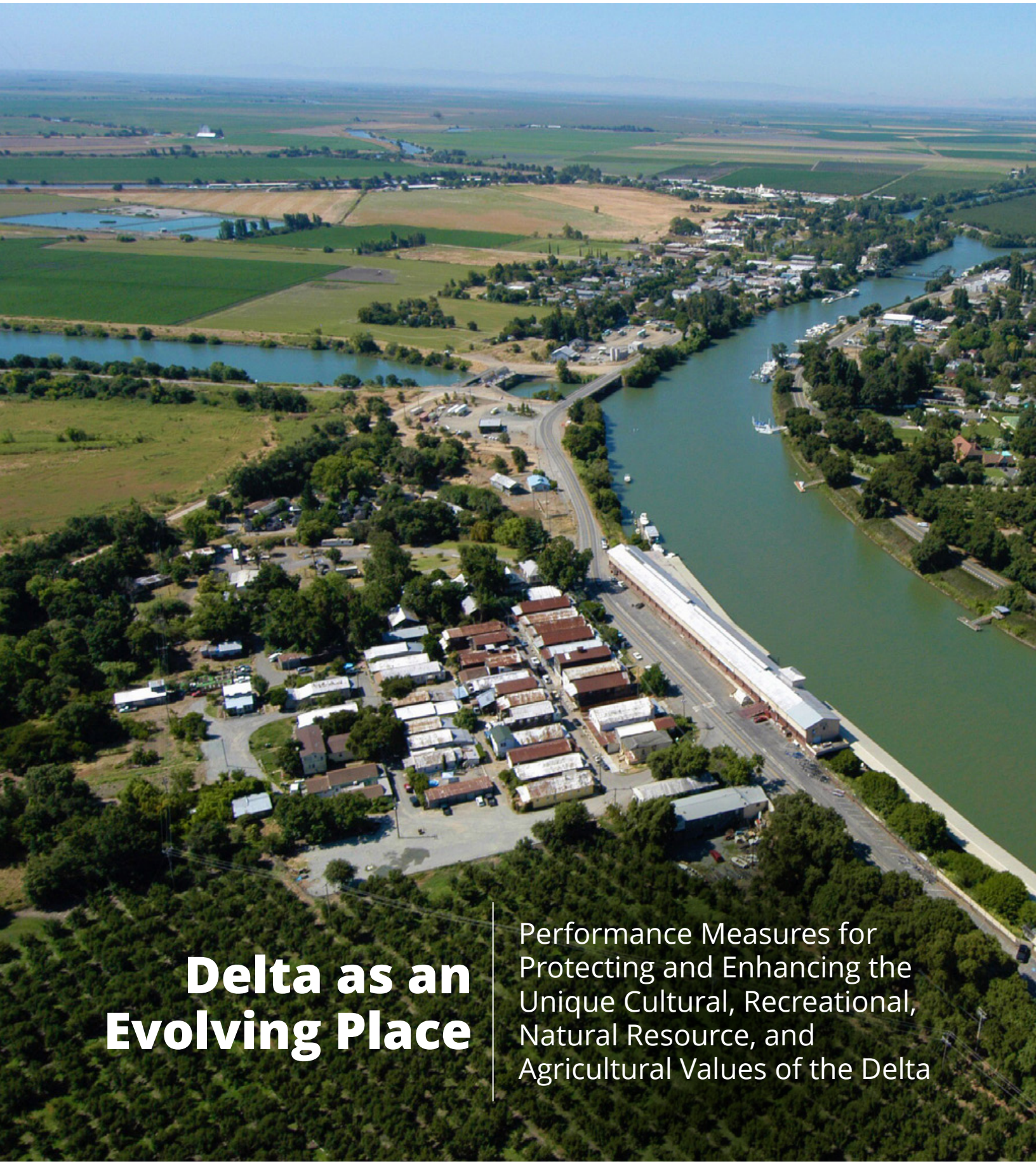
Target

Net increase of target acres of natural communities by 2050:

Ecosystem Type	Baseline Acres (2007 VegCAMP)
Seasonal Wetland Wet Meadow Nontidal Wetland	5,100
Willow Riparian Scrub/Shrub Valley Foothill Riparian Willow Thicket	14,200
Tidal Wetland	19,900
Stabilized Interior Dune Vegetation	20
Oak Woodland	0
Grassland	33,000
Vernal Pool Complex	5,100
Alkali Seasonal Wetland Complex	700

ADDITIONAL INFORMATION

- **Restoration of Ecological Processes:** Restoring native vegetation over the landscape will promote a more stable environment, providing a range of habitat options leading to increased biodiversity and expanding species population. Part of the process includes improving ecosystem processes such as primary production and energy transfer (using energy from the sun to produce organic matter through photosynthesis and then transferring that energy through the ecosystem), a critical step supporting the food chain and native species recovery.
- **Aquatic Primary Production:** Transfer of energy through the aquatic food web, from phytoplankton and algae to zooplankton and fish.
- **Vegetation Community Succession:** The process by which the structure of the vegetation community changes over time (e.g., species composition, the rank order of species, and spatial distribution).



Delta as an Evolving Place

Performance Measures for Protecting and Enhancing the Unique Cultural, Recreational, Natural Resource, and Agricultural Values of the Delta

Aerial view of Locke and Walnut Grove legacy communities along the Sacramento River, and the Delta Cross Channel. The communities and the surrounding landscapes have rich and unique natural, agricultural, and cultural heritage.

California Department of Water Resources • August 2005

Subsidence Reversal and Carbon Sequestration

Increase acres with subsidence reversal or carbon sequestration practices.

Farmland Loss

No change in farmland land use due to urban development.

Legacy Communities

Prepare and implement plans for the vitality and preservation of each Delta legacy community.

Recreation Opportunities

Recreation opportunities increase throughout the Delta and Suisun Marsh.

Delta Tourism

Recreation and tourism trends in the Delta increase.

Delta Economy

Improvements in Delta economy that include a mix of agriculture, tourism, recreation, commercial and other industries, as well as vital components of state and regional infrastructure expressed in the Regional Opportunity Index (ROI) within the Delta.

OUTCOME PERFORMANCE MEASURE 5.2

Subsidence Reversal and Carbon Sequestration

Increase acres with subsidence reversal or carbon sequestration practices.

Why is this Measure Important?

Much of the Delta is sinking through a process called subsidence. This subsidence is caused by the drainage of Delta wetlands. By exposing peat soils in the Delta for agriculture a process called oxidation occurs. This oxidation results in the loss of elevation and release of carbon dioxide; as a result, in some areas of the Delta land is up to 25 feet below sea level. Subsidence has made Delta levees less stable, increased flood risk, caused soil loss, and released vast quantities of carbon dioxide from oxidation. Continued land subsidence harms Delta agriculture because cultivation now requires expensive drainage systems and levee maintenance. It also reduces the space on the Delta landscape that is capable of supporting restored wetland habitat.

Subsidence can be reversed through a slow accumulation of new sediment on managed wetlands and mixed wetland-rice farms. Subsidence reversal projects can also sequester carbon allowing them to take advantage of carbon credit markets while helping California meet its greenhouse gas reduction targets. As more subsidence reversal projects are implemented we will learn more about subsidence reversal technology and enhance the Delta landscape.

Numbers and Goals

Metric	Acres of subsidence reversal and carbon sequestration projects, evaluated annually.
Baseline	Set at zero as of 2008.
Target	30,000 acres by January 1, 2030 (905 acres were converted in 2008–2011 and will be included towards meeting the target).

ADDITIONAL INFORMATION

Subsidence in the Delta began in the 19th century when the native wetlands were drained to allow for farming. The highly organic Delta soils were formed through centuries of decaying wetland plants. When exposed to the atmosphere, these peat soils naturally oxidize. In some parts of the central Delta, subsidence is occurring quickly enough that a half inch of soil is lost every year. In the present day Delta, microbial oxidation is the driver of subsidence. The result of this process is that much of the soil matter in the Delta is processed and released into the atmosphere as carbon dioxide and nitrous oxide. Both carbon dioxide and nitrous oxide are greenhouse gases that contribute to climate change.

OUTCOME PERFORMANCE MEASURE 5.3

Farmland Loss

No change in farmland land use due to urban development.

Why is this Measure Important?

Agriculture is the largest and most vital industry in the Delta. However, even though agriculture is the principal land use in the Delta, the total area of farmland has declined by about 20,000 acres during last 30 years.

Under current local government general plans, substantial farmland will change to urban development, resulting in up to 28,000 acres of additional lost farmland (Delta Stewardship Council. 2013. *The Delta Plan.* deltacouncil.ca.gov/delta-plan-0). Reductions in Delta farmland will impact businesses, jobs, and communities because cultivated farmland is critical to the Delta's significant agricultural economy. Preserving farmland promotes community and small family farms and retains the Delta's rural heritage. This measure tracks how much farmland is being converted to urban land and how much is planned for conversion.

Numbers and Goals

Metric	• Conversion of farmland acres to urban development, evaluated in conjunction with updates to the Farmland Mapping and Monitoring Program. • Conversion of land designated for agricultural use to urban land use, under General Plan land designations, evaluated annually.
Baseline	Number of acres of Delta farmland designated for agriculture in Delta Plan regulations at the time of Delta Plan adoption in May of 2013.
Target	By 2025, no conversion of farmland to urban development as defined by Delta Plan regulations.

OUTPUT PERFORMANCE MEASURE 5.5

Legacy Communities

Prepare and implement plans for the vitality and preservation of each Delta legacy community.

Why is this Measure Important?

The Delta has many communities with unique character and histories. The legacy communities have rich and unique natural, agricultural, and cultural heritage. In order to ensure that the Delta legacy communities remain vital, community action plans are being developed for each legacy community.

Vital communities are communities where residents work together to achieve a balance of positive social, economic, and environmental outcomes. Improvements to community vitality increase the likelihood of enduring economic downturns, natural disasters, social difficulties, and unforeseen stressors.

Tracking community action plans will help determine if legacy communities have plans to maintain their vitality. Tracking the implementation of those plans will help determine if these communities are achieving designated objectives that preserve Delta vitality.

Numbers and Goals

Metric	Number of community action plans adopted and initiated to achieve legacy community Delta Plan objectives, evaluated annually.
Baseline	Set at zero as of the Delta Plan's adoption date, May 2013.
Target	• All legacy communities have plans adopted by 2021. • 25 percent implementation of plan objectives achieved by 2025.

ADDITIONAL INFORMATION

Legacy communities are defined as communities that are "rich with a distinct natural, agricultural, and cultural heritage" in the Delta Reform Act. These communities include Locke, Bethel Island, Clarksburg, Courtland, Freeport, Hood, Isleton, Knightsen, Rio Vista, Ryde, and Walnut Grove. Each of these communities has unique heritage important to the character of the Delta. The history of each of the legacy communities contributes to the story of America. For example, the town of Locke is known as "the only town in the United States built primarily by early Chinese immigrants" (Delta Reform Act). The town of Freeport was founded in the 1860s amid early railroad expansion in California on a 10 mile line created to circumvent port taxes. Each of these communities are living legacies of our heritage. Because of that, Congress designated the Delta as California's first National Heritage Area in 2019. National Heritage Areas are culturally important landscapes that require designation from Congress. If the Delta becomes a National Heritage Area, it would be the first in California.

OUTCOME PERFORMANCE MEASURE 5.6

Recreation Opportunities

Recreation opportunities increase throughout the Delta and Suisun Marsh.

Why is this Measure Important?

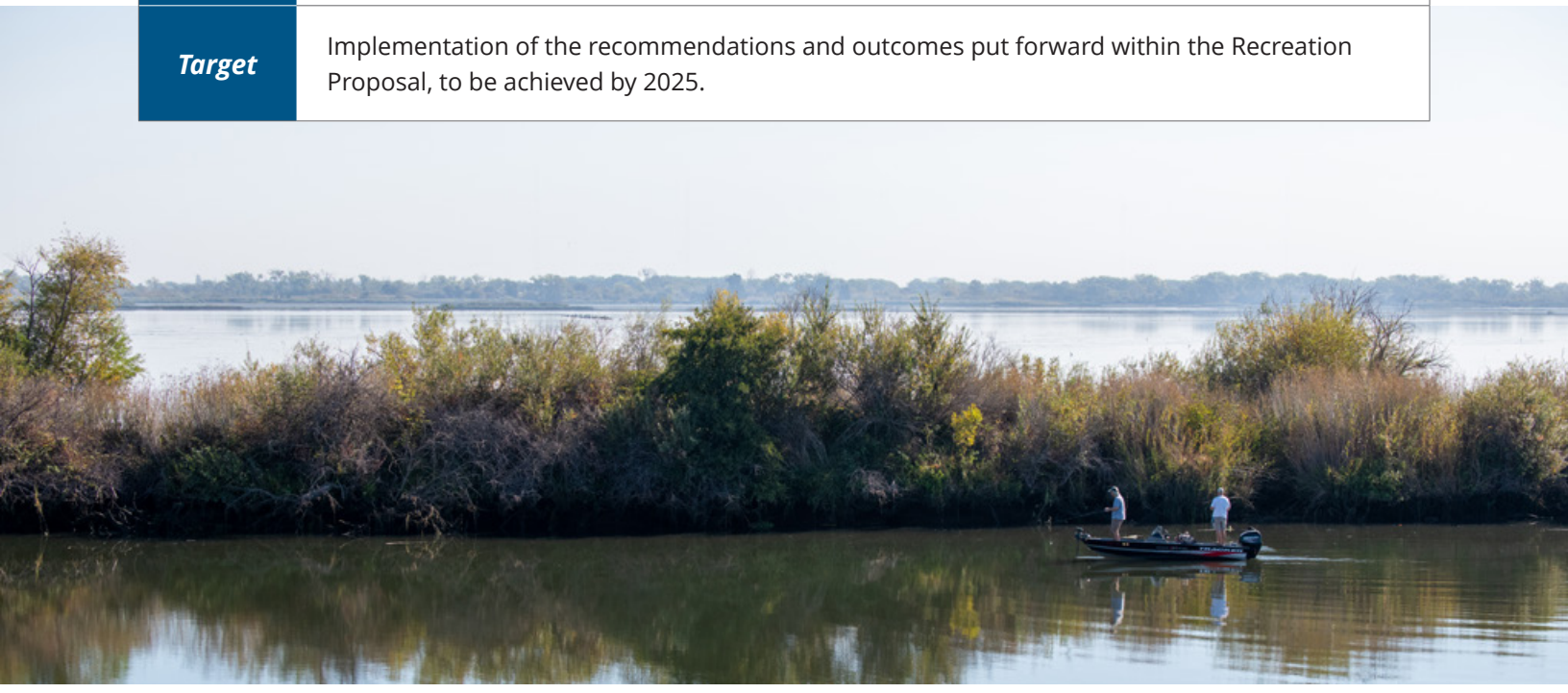
The Delta and Suisun Marsh region has a mix of land and water and offers diverse recreation opportunities. Many visitors and locals enjoy boating, fishing, cultural tourism, agricultural tourism, and the Delta's natural landscapes.

To support recreation in the Delta, the California Department of Parks and Recreation developed a Recreation Proposal for the Delta and Suisun Marsh. The recreation proposal presents recommendations for protecting and enhancing recreational opportunities in the Delta. The recommendations include ways to invite more visitors and residents to enjoy and appreciate the Delta and Suisun Marsh region.

Tracking the implementation of the Recreation Proposal recommendations will provide information on the enhancement of Delta recreation.

Numbers and Goals

Metric	Number of regional Recreation Proposal recommendations and outcomes implemented within the Delta and Suisun Marsh, evaluated annually.
Baseline	Measured as of the date of the regional Recreation Proposal completion in 2011.
Target	Implementation of the recommendations and outcomes put forward within the Recreation Proposal, to be achieved by 2025.



OUTCOME PERFORMANCE MEASURE 5.8

Delta Tourism

Recreation and tourism trends in the Delta increase.

Why is this Measure Important?

The Delta is a world-class tourism destination, and investment in Delta communities will bring changes that enrich agriculture, support services, recreation quality, and the Delta economy. Many recreation and tourism opportunities are already present, and many additional ones have not been fully developed due to inadequate visitor information, aging/inadequate facilities, and restricted access to public lands.

The Delta Conservancy, in collaboration with the Delta Protection Commission and the Delta Marketing Task Force, prepared a Delta Tourism Awareness five-year Marketing Plan in 2017. The Marketing Plan is a tool for the Delta community to develop and implement creative strategies to attract visitors, articulate key metrics for success, strengthen Delta branding, and build a Delta-centric tourism website. The website, Visit CA Delta (www.visitcadelta.com), is supported by a partnership of Delta businesses and provides information about recreation and tourism opportunities and events in the Delta.

This performance measure will assist decision-making related to protecting and enhancing recreational and tourism resources in the Delta.

Numbers and Goals

Metric	**Metrics evaluated annually:** • Acres of State and federal land accessible to the public for recreation and tourism. • Length (in linear feet) of shoreline accessible for public recreation. • Number of fishing licenses bought per year by county. • Number of first-time visitors. • Number of off-season visitors. • Number of website views and social media traffic. • Number of existing and new visitor engagement.
Baseline	Measured as of July 2018.
Target	Increase of five percent, for each metric from the prior year, over a five-year period.

OUTCOME PERFORMANCE MEASURE 5.9

Delta Economy

Improvement in Delta Economy and the Regional Opportunity Index (ROI) within the Delta sustains a vital economy.

Why is this Measure Important?

A vital Delta economy supports a mix of agriculture, tourism, recreation, commercial and other industries in the Delta, as well as vital components of state and regional infrastructure and improving conditions for underrepresented communities.

The Delta Protection Commission worked with the UC Davis Center for Regional Change to apply the ROI to the Delta. ROI incorporates both a "people" component and a "place" component, integrating economic infrastructure, environmental, and social indicators into a comprehensive assessment of the factors driving opportunity. The goal of the ROI is to identify people and places with the greatest needs. Using this information decision-makers can target resources to foster thriving communities of opportunity for all Californians.

ROI includes indicators for education, local economy, housing, transportation, infrastructure, health care services, and civic engagement, and allows for comparison with regions of interest (local, regional, or state). Tracking this index will aid our understanding of Delta community needs.

Numbers and Goals

Metric	**Metric to be evaluated every five years:** • ROI People and Place, in the Primary Zone and Secondary Zone (score).
Baseline	Measured as of 2012.
Target	Regional Opportunity Index for People and Place (score), within the Delta, increases by five percent by 2025.

Water Quality

Performance Measures for Improving Water Quality to Protect Human Health and the Environment

Florence Low • California Department of Water Resources

Delta Water Quality

Water quality in the Delta and Suisun Marsh meets the standards of the Clean Water Act.

Salinity

Water management agencies comply with State Water Resources Control Board objectives for salinity in the Delta for D-1641 and X2.

North Bay Aqueduct

North Bay Aqueduct Alternate Intake Project is implemented to improve water quality, protect native fishes, and to provide reliable water deliveries.

Protect Groundwater

Groundwater meets drinking water quality standards in the Delta for nitrate and arsenic.

Dissolved Oxygen

Applicable dissolved oxygen (DO) standards in the Delta and Suisun Marsh are consistently met.

Critical Pesticides

Reduction in number of critical pesticides in the waters and sediments of the Delta and Suisun Marsh.

Inorganic Nutrients

Concentrations and/or loads of bio-stimulatory substances (inorganic nutrients) in Delta waters is reduced.

Measurable Toxicity

Measurable reduction in positive toxicity tests using standard methods, for pesticides and other pollutants in Delta waters.

Harmful Algal Blooms

Spatial coverage of freshwater harmful algal blooms (HABs) in select waterbodies in the Delta is reduced.

OUTCOME PERFORMANCE MEASURE 6.1

Delta Water Quality

Water quality in the Delta and Suisun Marsh meets the standards of the Clean Water Act (CWA).

Why is this Measure Important?

For the protection of beneficial uses in the Delta, it is important to measure the reduction of impaired water bodies on the 303(d) list of the CWA. Consistent (good) water quality is crucial for successful restoration efforts of aquatic habitats and other beneficial uses of Delta water. High amounts of pollutants or other water quality issues can impair the ability of water to support beneficial uses, such as: recreational use, agricultural water supply, municipal water supply, and healthy habitat for native vegetation and wildlife.

Numbers and Goals

Metric	The number of Delta watershed "waterbody-contaminant" combinations on the 303(d) list, evaluated every eight years within the State Water Resources Control Board (SWRCB) Integrated Report.
Baseline	Measured as of the 2010 SWRCB Integrated Report.
Target	Reduction of 40 percent of the "waterbody-contaminant" combinations on the 303(d) list by 2034.

ADDITIONAL INFORMATION

The CWA protects and restores surface water quality by regulating pollutants and quality standards for the waters of the United States. In California, the SWRCB and its regional boards evaluate surface water quality data and develop a list of waters that do not meet established water quality standards (impaired waters) and those that currently meet water quality standards but may exceed them in the next reporting cycle (threatened waters).

The 303(d) list contains the waterbody name and the type of contaminant in the waterbody. A waterbody can contain several combinations of contaminants. The impaired water list is evaluated every two years to determine if waterbodies meet the water quality standards. Polluted waters continue to be monitored and assessed until applicable water quality standards are met. The SWRCB issues integrated reports with updated 303(d) water bodies lists.

Kayaking in the North Delta. *Shira Bezalel • San Francisco Estuary Institute • June 2017*

OUTCOME PERFORMANCE MEASURE 6.2

Salinity

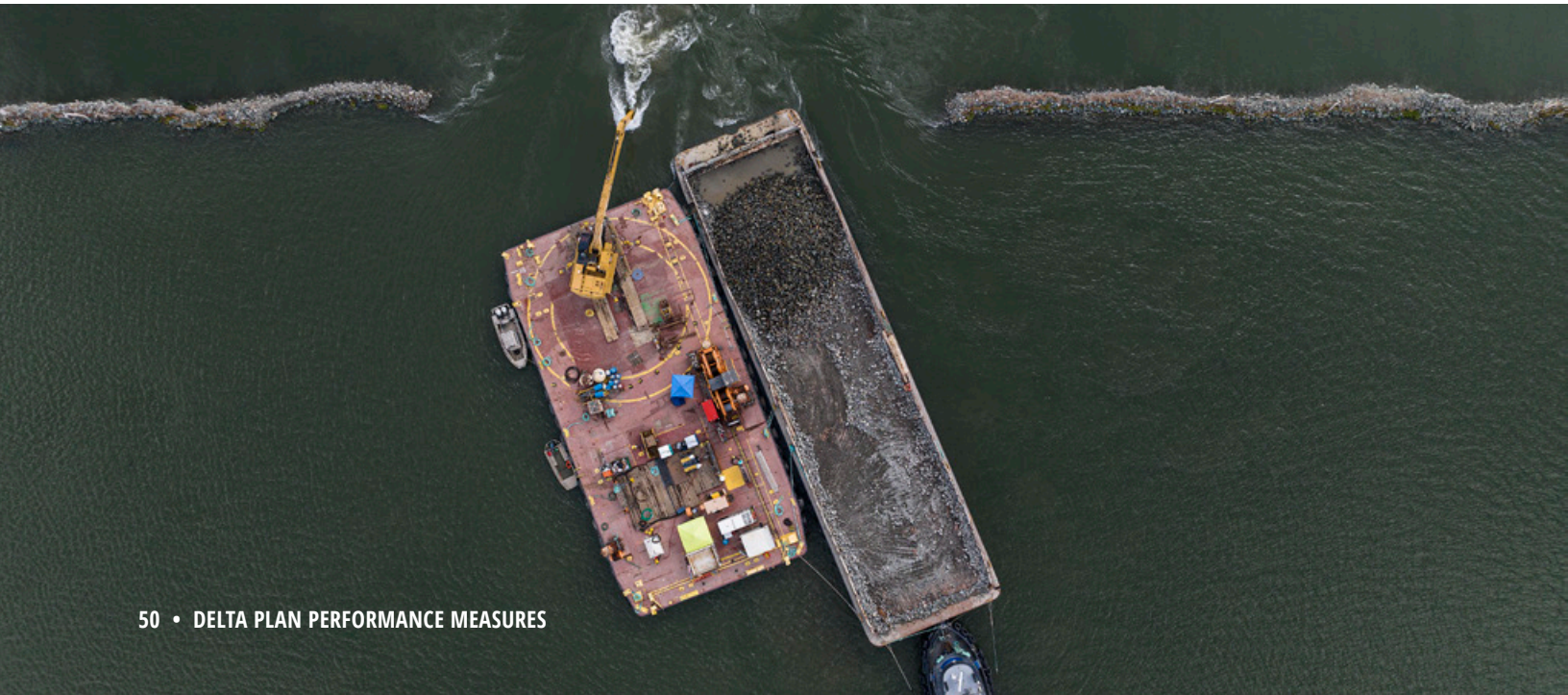
Water management agencies comply with State Water Resources Control Board objectives for salinity in the Delta for D-1641 and X2.

Why is this Measure Important?

Salinity in the Delta is an important water quality characteristic affecting municipal, industrial, agricultural, and fish and wildlife water uses. Changes in Delta salinity have far reaching impacts, from affecting water supply for farmers in the Central Valley to the wildlife and ecosystems of the San Francisco Bay. When salinity exceeds compliance conditions or changes too rapidly, it can have negative impacts on many beneficial uses of water. This includes altered water taste and availability, crop damage and loss, and limitations for recharging groundwater.

The Delta is a transition zone between freshwater and saltwater, serving as an important habitat for hundreds of native terrestrial and aquatic organisms. The amount of freshwater flowing into and through the Delta drives seasonal and annual salinity levels.

Both natural and man-made actions affect salinity in the Delta and Suisun Marsh. Tidal forces, agricultural run-off, exports, and freshwater inflow from the Sacramento and San Joaquin Rivers jointly influence salinity levels of the Delta. The management of salinity is governed by the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (USBR) due to their roles in managing reservoirs in the watershed and water exports in the Delta. Since DWR and USBR are water right holders for the State Water Project and Central Valley Project, respectively, they must comply with State Water Resources Control Board Decision 1641 (D-1641) requirements, which help protect water quality in the Delta by setting flow and salinity objectives.



ADDITIONAL INFORMATION

Salinity in the Delta is regulated by the State Water Resources Control Board (SWRCB) in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Plan). The SWRCB Decision 1641 (D-1641) sets flow, water quality, and monitoring requirements to meet water quality objectives for municipal and industrial, agricultural, and fish and wildlife.

Salinity is the total concentration of all dissolved salts in water. There are various metrics for measuring salinity in water, including direct measurement of salt content in parts per thousand, as well as measurements derived from electrical conductivity (EC), which increases with increasing salinity levels.

One important salinity standard is the "X2" factor and it is designed specifically to protect the aquatic life of the Delta estuary. X2 is a physical attribute of the estuary used as a habitat indicator for the location of the low salinity zone. X2 is the location in kilometers from the Golden Gate Bridge where water salinity is 2 ppt (parts per thousand) of isohaline salt.

The low salinity zone is where freshwater transitions into brackish water. Historically, the low salinity zone was associated with high primary productivity, zooplankton population, and abundance of native species. U.S. Fish and Wildlife Service designated an additional X2 standard for fall months to provide suitable habitat for organisms using this low salinity region, and is implementing an adaptive management plan for this action to study the relationship between fall X2 and the endangered Delta smelt.

Numbers and Goals

Metric	Monthly electrical conductivity, water temperature, and X2 in the Delta and Suisun Marsh, evaluated annually.
Baseline	Average monthly electrical conductivity, water temperature, and X2 at SWRCB compliance points from 1995 to 2015.
Target	**Targets are to be achieved upon the adoption of these performance measures:** • Water management agencies meet SWRCB salinity objectives for ecosystem purposes at least 99 percent of the time at compliance points. • Water management agencies meet all other SWRCB salinity objectives for urban and agricultural beneficial use at least 99 percent of the time at compliance points. • Water management agencies maintain average X2 for September and October at or less than 74 km in the fall following wet years and at or less than 81 km in the fall following above normal years. The monthly average X2 must be maintained at or seaward of these values for each individual month and not averaged over the two-month period.

OUTPUT PERFORMANCE MEASURE 6.3

North Bay Aqueduct

North Bay Aqueduct Alternate Intake Project is implemented to improve water quality, protect native fishes, and provide reliable water deliveries.

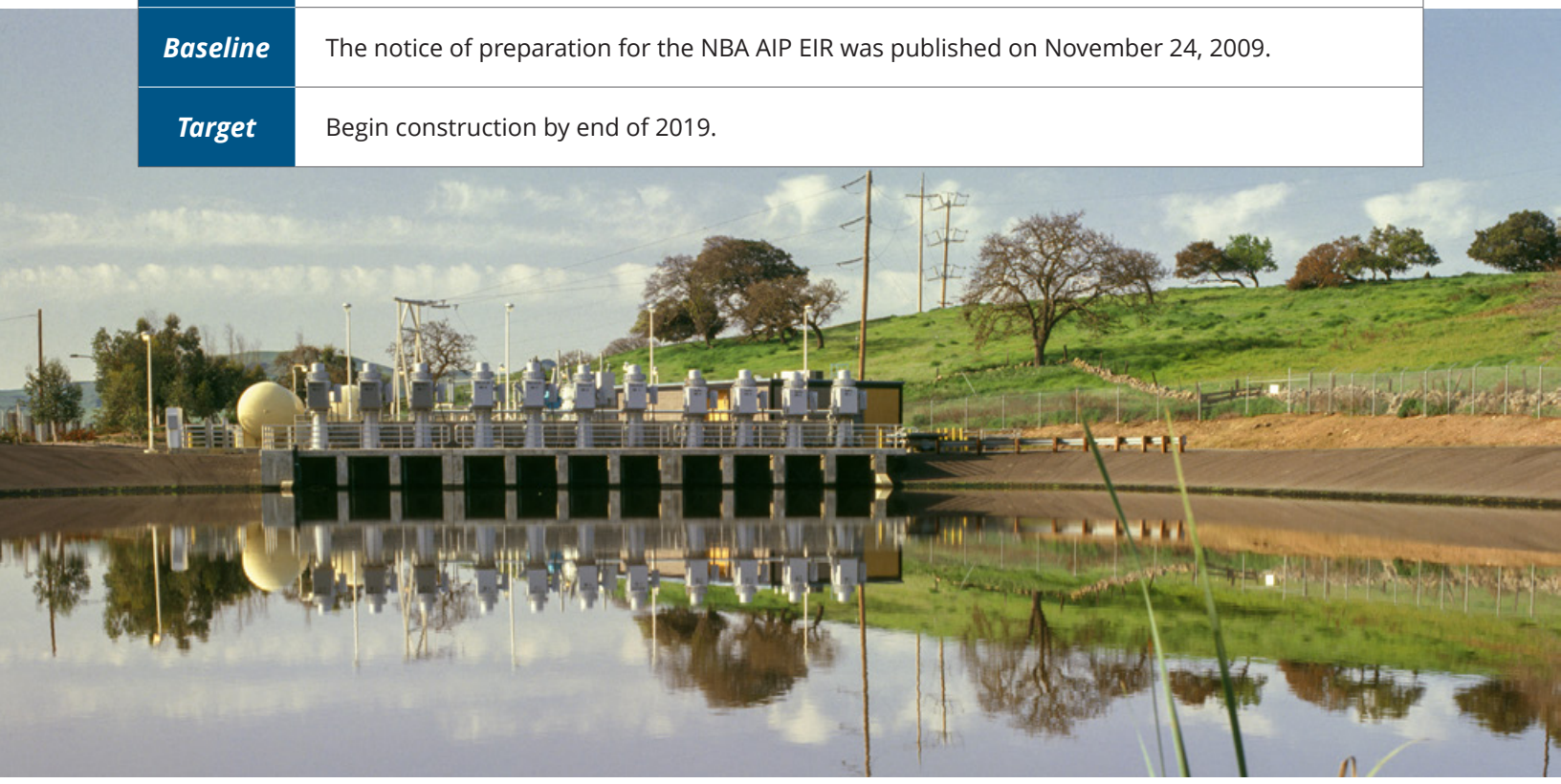
Why is this Measure Important?

The North Bay Aqueduct Alternate Intake Project (NBA AIP) will provide long-term water quality improvements and reliable deliveries to the NBA water contractors. The project will support operational flexibility to reduce effects on listed species and critical habitat in Barker Slough (existing intake location). The project includes constructing a new pumping station on the Sacramento River south of West Sacramento and a pipeline to connect to the existing NBA—providing a second source of drinking water supply.

The current North Bay Aqueduct intake is located in Barker Slough (North West Delta in Solano County) where it is strongly affected by water quality in the local watershed, has the highest average organic carbon concentrations of any Delta municipal water supply intake, and is located in high-quality habitat for listed native fish species.

Numbers and Goals

Metric	Project Status.
Baseline	The notice of preparation for the NBA AIP EIR was published on November 24, 2009.
Target	Begin construction by end of 2019.



OUTPUT PERFORMANCE MEASURE 6.4

Protect Groundwater

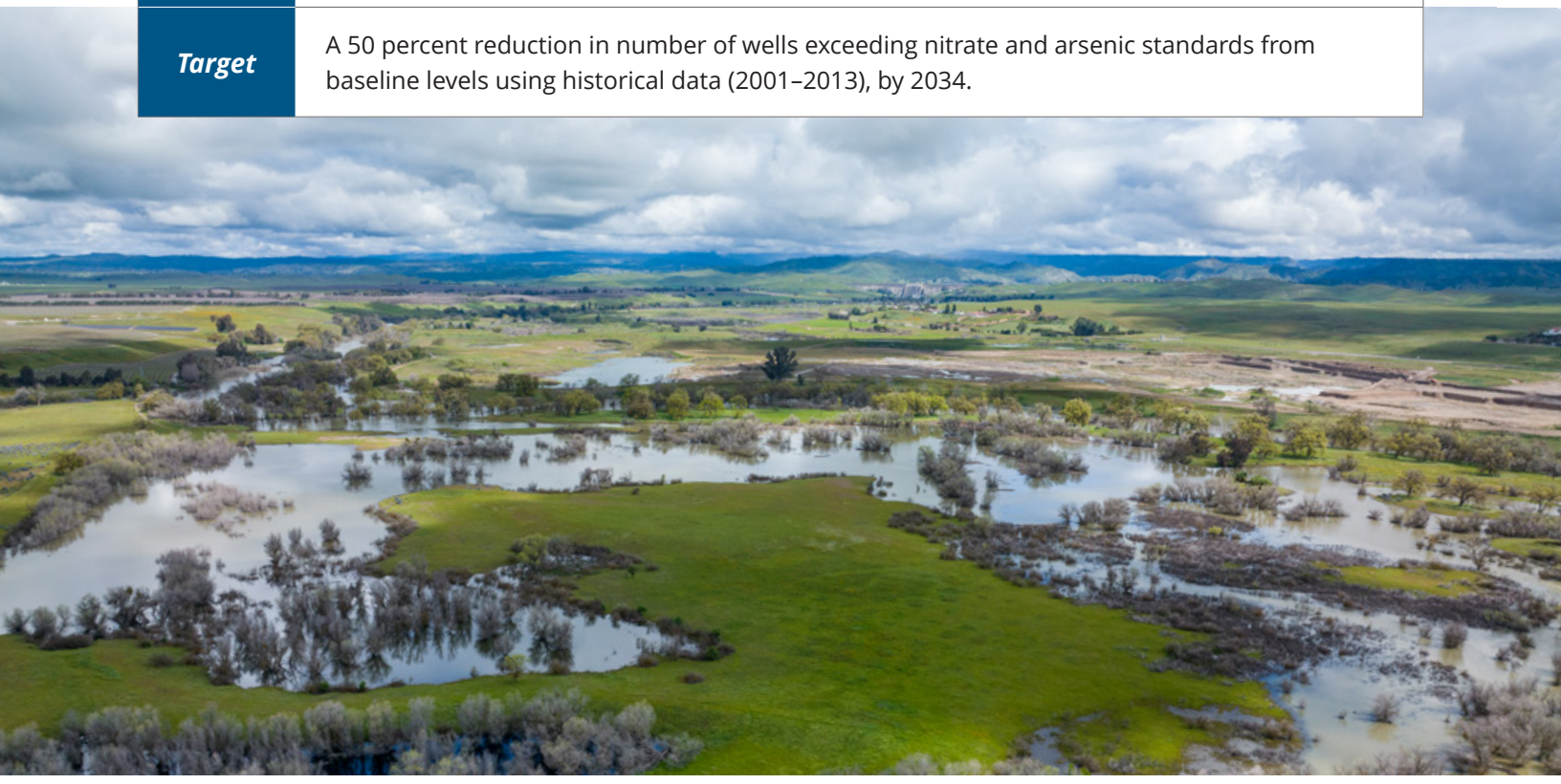
Groundwater meets drinking water quality standards in the Delta for nitrate and arsenic.

Why is this Measure Important?

Groundwater wells used for domestic and municipal water supply that exceed arsenic and/or nitrate drinking water limits in the Delta are water quality issues and are possible indicators of other more serious contaminants. This is especially true for small water systems and disadvantaged communities that are highly dependent on groundwater sources that may not meet certain drinking water quality standards. Sources of nitrate and arsenic contamination can come from both natural and man-made sources. Consumption of high levels of nitrate and arsenic have various long and short term health effects.

Numbers and Goals

Metric	Number of groundwater wells used for drinking water supply that exceed arsenic and/or nitrate drinking water limits, evaluated every 5 years.
Baseline	Number of wells within the Delta that exceed 2008 California water quality standards for levels of nitrate (not to exceed 10 ppm NO3-N) and arsenic (not to exceed 10 ppb As) between the years of 2001 and 2013.
Target	A 50 percent reduction in number of wells exceeding nitrate and arsenic standards from baseline levels using historical data (2001–2013), by 2034.



OUTCOME PERFORMANCE MEASURE 6.5

Dissolved Oxygen

Applicable dissolved oxygen (DO) standards in the Delta and Suisun Marsh are consistently met.

Why is this Measure Important?

DO water quality objectives ensure aquatic organisms receive minimum dissolved oxygen requirements for optimal growth and life support. Meeting dissolved oxygen water quality standards will help prevent negative effects to wildlife. For example, dissolved oxygen concentrations in the Stockton Deep Water Ship Channel and Old and Middle Rivers can drop to inhospitable conditions during warmer and lower water flow periods. In Suisun Marsh, the decay of plant matter in late summer and early fall causes severe dissolved oxygen depletion. Low concentrations of dissolved oxygen can adversely affect aquatic life, including the health and migration of native fish, such as Chinook salmon.

Several actions taken to comply with the minimum dissolved oxygen requirements, along with improved water flow and a reduction of pollution loads in the San Joaquin watershed appear to have provided a solution to this water quality problem. Consistently meeting the dissolved oxygen levels above the minimum recommended levels specified in the Sacramento River and San Joaquin River Basins and San Francisco Bay Water Quality Control Plans will benefit the Delta ecosystem by providing optimal living conditions to native aquatic wildlife.

Numbers and Goals

Metric	**Progress of performance measure metrics are to be evaluated annually:** • Milligrams of DO per liter of water (mg/L). • Continuous, real-time DO measurements made at multiple locations throughout the Delta.
Baseline	Measured as of the date of the Delta Plan's adoption, May 2013.
Target	**Targets to be achieved upon the adoption of this performance measure:** • Meet water quality objectives for DO in the Stockton Deep Water Ship Channel, Suisun Marsh, and Old and Middle Rivers. • Maintain or exceed the minimum DO concentrations of: ◦ 5 mg/L daily average everywhere in the Delta. ◦ 6 mg/L daily average from September through November in the San Joaquin River between Turner Cut and Stockton.

OUTPUT PERFORMANCE MEASURE 6.7

Critical Pesticides

Reduction in number of critical pesticides in the waters and sediments of the Delta and Suisun Marsh.

Why is this Measure Important?

An overall reduction of critical pesticides in the waters and sediments of the Delta and Suisun Marsh will be beneficial for ecosystem health and drinking water supplies. The Central Valley Regional Water Quality Control Board (CVRWQCB) Basin Plan sets objectives to control pesticide runoff into Delta waters.

Although pesticides have many uses for agriculture, urban, and residential areas, they also have the potential to contaminate drinking water supplies. Aquatic ecosystems contain species related to the target organisms of pesticides, and undesirable side effects may occur to native and desired species due to high pesticide exposure. The California Department of Pesticide Regulation reports that 13,084 pesticide formulations are registered in the state and are of concern to fish and zooplankton health.

Numbers and Goals

Metric	The number of Delta watershed "waterbody-pesticide" combinations on the 303(d) list, evaluated every eight years within the State Water Resources Control Board (SWRCB) Integrated Report.
Baseline	Measured as of the 2010 SWRCB Integrated Report.
Target	Reduction of 40 percent of the "waterbody-pesticide" combinations on the 303(d) list by 2034.

OUTPUT PERFORMANCE MEASURE 6.8

Inorganic Nutrients

Concentrations and/or loads of bio-stimulatory substances (inorganic nutrients) in Delta waters is reduced.

Why is this Measure Important?

Inorganic nutrients are bio-stimulatory substances that are essential parts of the ecosystem and include: Ammonium (NH4), Nitrate (NO3), Phosphate (PO4).

Without these nutrients, ecosystems cannot survive. Naturally, the nutrients are limited resources. Human activities contribute to increased levels of nutrients in the ecosystem. High amounts of nutrients negatively affect water quality, fish and wildlife populations, and humans.

One major source of nutrients to the Delta is sewage. Sewage effluent, along with other factors such as temperature and low water flow, can stimulate algal growth in the Delta and reservoirs. Elevated nutrients can increase non-native aquatic vegetation (e.g., water hyacinth), disrupt food webs, and cause taste and odor problems with drinking water.

Currently, numeric water quality objectives for nutrients are not determined. The Delta Nutrient Research Plan calls for additional work to understand nutrient impacts before nutrient water objectives can be considered. By monitoring specific inorganic nutrients, programs can begin to develop a control or regulatory strategy to address issues related to nutrient impairment.

Numbers and Goals

Metric	Concentrations and/or loads of bio-stimulatory substances (inorganic nutrients, such as ammonium, nitrate, and phosphate) at Delta water quality monitoring locations, evaluated annually.
Baseline	Bio-stimulatory substance concentrations, loads, and trends during the period of 2004–2013.
Target	Meet the limits and targets identified by the Delta Nutrient Science and Research Program by 2034.

OUTCOME PERFORMANCE MEASURE 6.9

Measurable Toxicity

Measurable reduction in positive toxicity test using standard methods, for pesticides and other pollutants in Delta waters.

Why is this Measure Important?

Contaminant toxicity is a growing concern because it adversely affects all organisms and people who rely on water bodies—impacting water quality, ecosystem health, and the reproduction and viability of organisms coming in contact with the water. Even at low concentrations, these chemicals can have negative effects over longer periods of exposure for larger organisms.

Moreover, toxicity in Delta water is especially a concern for threatened and endangered species, as certain chemicals have detrimental effects on reproduction and offspring viability. It is important that toxicity is measured using organisms sensitive to the contaminants present and representative of the environment being sampled.

Numbers and Goals

Metric	Toxicity in sediments using invertebrates determined by standard methods approved by the United States Environmental Protection Agency (USEPA) as measured by the State Water Resources Control Board.
Baseline	The 2008–2012 averaged levels of toxicity using combined toxic and highly toxic sites from the Stream Pollution and Monitoring Program Report (18.8 percent toxicity).
Target	Less than 1 percent toxicity in sediment samples from pesticides and other contaminants, using invertebrates testing, by 2034.

ADDITIONAL INFORMATION

The USEPA standard methods are guidelines on how to measure the toxicity of waterbodies and sediments. The USEPA methods use specific invertebrates and monitor and evaluate their responses to associated contaminants in freshwater sediments.

The Stream Pollution and Monitoring Program (SPOT) monitors trends in sediment toxicity and contaminant concentrations in selected large rivers throughout California, and relates it to watershed land uses. The overall goal of this long-term trends assessment is to detect meaningful change in the concentrations of contaminants and their biological effects in large watersheds at time scales appropriate to management decision-making.

OUTCOME PERFORMANCE MEASURE 6.10

Harmful Algal Blooms

Spatial coverage of freshwater harmful algal blooms (HABs) in select waterbodies in the Delta is reduced.

Why is this Measure Important?

Algae are natural components of marine and fresh water ecosystems and form the foundation of most aquatic food chains. However, algae have the potential to harm humans and wildlife when a specific blue green algae is present. HABs impact water quality conditions by impeding recreation, reducing aesthetics, lowering dissolved oxygen concentrations, and causing altered drinking water taste. HABs are a growing concern for drinking water treatment plants, as it is common for municipalities with HABs present in their water supply to send out cautionary drinkability notices to residents.

HABs are abundant when surface waters are warm and/or stagnant. Monitoring harmful algal blooms in the Delta will assist in the evaluation of risk to human and aquatic health, as well as provide better understanding of connections and factors promoting or maintaining harmful algal blooms.

Numbers and Goals

Metric	Spatial coverage (acres) of *Microcystis sp.* cell concentration equivalents (cells/ml), in Delta waterbodies large enough to use the State Water Resources Control Board mapping tool (e.g., Discovery Bay; South Delta along Grantline Canal and Old River surrounding Fabian Tract; Big Break Regional Shoreline; and San Joaquin River between Antioch and Stockton) with densities of 100,000 cell/ml or greater, evaluated annually.
Baseline	Spatial coverage (acres) based on satellite images during the period of 2016–2017.
Target	**Target to be achieved by 2034:** • Zero acres of waterbodies with densities of 100,000 cells/ml^3 or more by 2034.

Algae at Big Break, Antioch.

Protect People and Property

Performance Measures for Reducing Risk to People, Property, and State Interests in the Delta

Aerial view of damage to residential properties caused by the Jones Tract levee breach.

On Thursday morning of June 3, 2004, a levee breach occurred on Bacon Island Road, the east levee of the Upper Jones Tract.

The break was approximately 1/4 mile north of the Woodward Island Ferry as floodwaters from the Middle River overran farms and dozens of homes in the southern region of the Delta in San Joaquin County.

Paul Hames • California Department of Water Resources • August 28, 2004

Multi-Hazard Coordination Task Force

Responsible local, state, and federal agencies with emergency response authority, implement the recommendations of the Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force.

Flood Causalities and Damages

Expected annual fatalities and expected property damages from flood emergencies in the Delta are decreased.

Delta Levees

Delta levees reduce the flood related risk to people, property, and state interests in the Delta.

Delivery Interruption

No water-delivery interruption due to floods or earthquakes in the Delta.

Sea Level Rise Planning

Flood protection planning for new residential development in the Delta considers sea level rise.

Flood Insurance Community Rating

Community credit points in National Flood Insurance Program (NFIP) Community Rating System increase.

OUTPUT PERFORMANCE MEASURE 7.1

Multi-Hazard Coordination Task Force

Responsible local, state, and federal agencies with emergency response authority implement the recommendations of the Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force.

Why is this Measure Important?

The Sacramento-San Joaquin Delta Multi-Hazard Coordination Task Force created recommendations that will improve emergency preparedness and response in the Delta. Tracking the completion status of the task force recommendations indicates overall performance of responsible agencies implementing the emergency preparedness and response strategy.

Having a well-planned and executed emergency preparedness and response strategy will help reduce potential casualties and damages from all hazards.

Numbers and Goals

Metric	Percent of recommendations implemented. This will be evaluated annually.
Baseline	Zero percent (0/11) of recommendations implemented.
Target	100 percent (11/11) of recommendations implemented by the end of 2018.

Deployable Tactical Operations Systems, Isleton. *U.S. Army Corps of Engineers • October 2014*

OUTCOME PERFORMANCE MEASURE 7.2

Flood Causalities and Damages

Expected annual fatalities and expected property damages from flood emergencies in the Delta are decreased.

Why is this Measure Important?

Reducing flood risks to people, property, and state interests is critical in achieving the coequal goals and protecting the Delta as a place. Evaluating risks to people, assets, water supply reliability, the Delta ecosystem, and the Delta requires considering both the probability and the consequences of flooding. The Delta Stewardship Council developed the Delta Levees Investment Strategy (DLIS) to address the need to evaluate risk in the Delta. It includes probabilistic estimates of Expected Annual Fatalities (EAF) and Expected Annual Damages (EAD).

The Delta Plan promotes several strategies for reducing flood risks in the Delta, including continued emergency preparedness, investment in levees, managing land use, and protecting and expanding floodways, floodplains, and bypasses.

This performance measure will track if measurable negative effects of flooding on the people and property in the Delta have been reduced.

Numbers and Goals

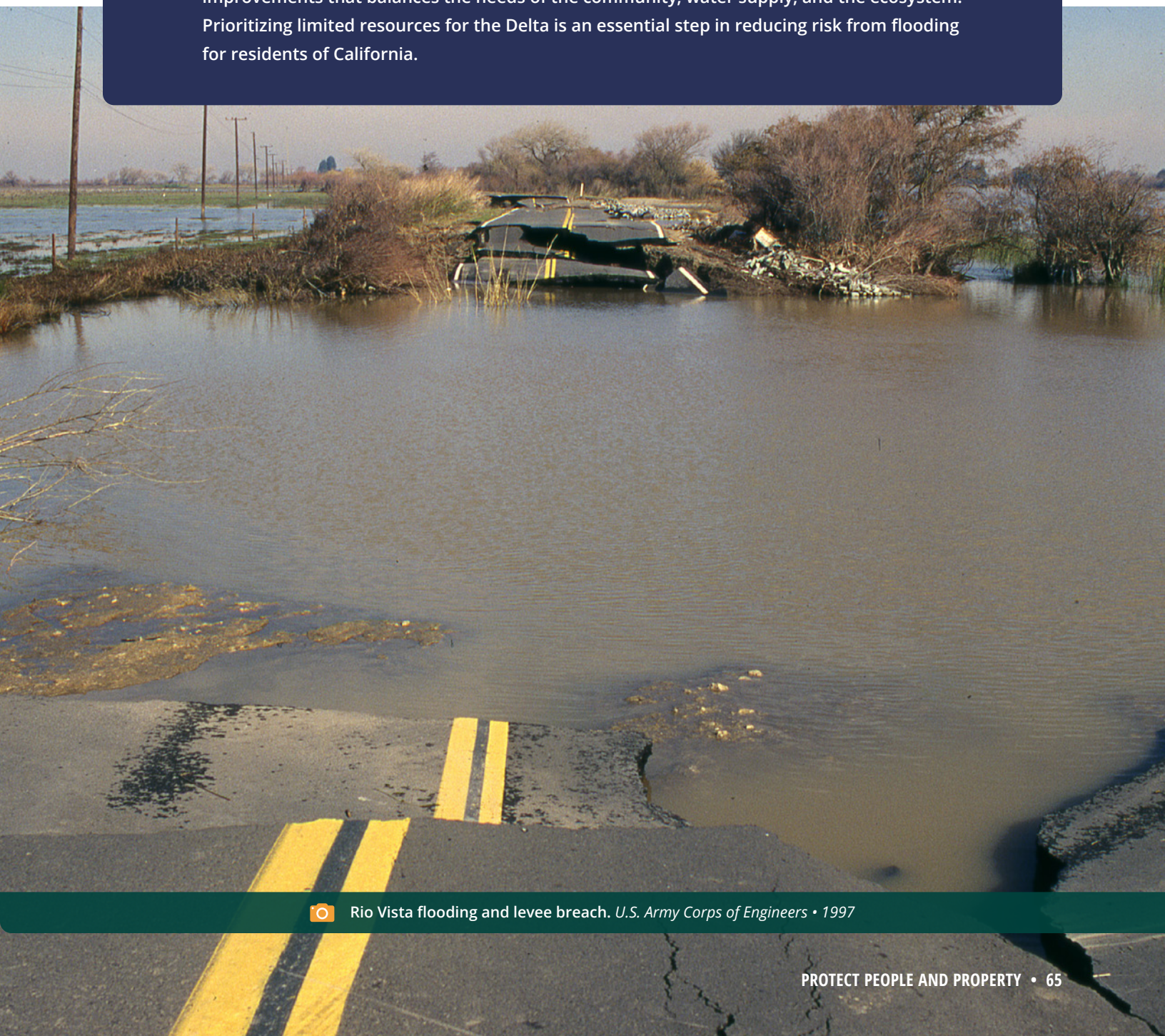
Metric	• EAF in the Delta. This will be evaluated at least every five years. • EAD in the Delta. This will be evaluated at least every five years.
Baseline	• EAF for the Delta using best available data as of 2017, as reported in the Delta Levees Investment Strategy final report. • EAD for the Delta using best available data as of 2017, as reported in the Delta Levees Investment Strategy final report.
Target	• 50 percent decrease in EAF by 2025. • 50 percent decrease in EAD by 2025.

ADDITIONAL INFORMATION

The DLIS combined the best available data for calculating the probability of flooding with consequences data to evaluate five risk metrics:

- EAF.
- EAD.
- Potential for water supply disruption.
- Harm to the ecosystem.
- Damage to the Delta as a place.

In addition to evaluating risk in the Delta, DLIS provides a framework for investing in levee improvements that balances the needs of the community, water supply, and the ecosystem. Prioritizing limited resources for the Delta is an essential step in reducing risk from flooding for residents of California.



Rio Vista flooding and levee breach. *U.S. Army Corps of Engineers • 1997*

OUTPUT PERFORMANCE MEASURE 7.3

Delta Levees

Delta levees reduce the flood related risk to people, property, and state interests in the Delta.

Why is this Measure Important?

California Department of Water Resources (DWR) conducted a comprehensive statewide flood planning initiative and in 2012 set Urban Levee Design Criteria. The Urban Levee Design Criteria (ULDC) are specific engineering criteria for levees designed to ensure that California's urban areas are adequately protected. In the Delta, most levees are rural, however there are six levees in the Delta that protect urban areas.

The Delta is an inherently flood prone area. Historically before the Delta was modified with levees and other human structures, the Delta's low-lying islands and floodplains overflowed with rivers' natural flows for long periods each spring. Today, levees within the legal Delta protect approximately 740,000 acres of land. Many Delta levees protect land below sea level, they hold back water all day, year-round, rather than only during floods, and are called "the hardest working levees in America" (Delta Stewardship Council. 2013. *The Delta Plan.* deltacouncil.ca.gov/delta-plan-0).

Reducing flood risks to people, property, and state interests is critically important in the Delta and levees play a major role in flood related risk reduction. State and federal guidelines and criteria establish minimum criteria for levee design and maintenance. The Public Law 84-99 (PL 84-99) standard is a minimum requirement established by U.S. Army Corps of Engineers (USACE). USACE developed a Delta-specific standard based on the Delta particular organic soils and levee foundation conditions.

Levees in the Delta will be improved over time to reduce the flood related risk to people, property, and state interests in the Delta. This measure tracks the quality of Delta levees against predominant levee standards.

Numbers and Goals

Metric	• Percentage of urban communities in the Delta protected by levees meeting DWR's urban level of flood protection criteria. This will be evaluated at least every five years. • Percentage of rural Delta islands and tracts protected by levees at or above the Bulletin 192-82/PL 84-99 standard. This will be evaluated at least every five years.
Baseline	• Percent of urban area in the Delta protected by levees meeting DWR's urban level of flood protection criteria, as of completion of the Delta Levees Investment Strategy. • Percentage of rural Delta islands and tracts protected by levees at or above the Bulletin 192-82/PL 84-99 standard, as of completion of the Delta Levees Investment Strategy.
Target	• 100 percent of urban communities in the Delta are protected by levees meeting DWR's urban level of protection criteria, demonstrated by 2025. • 100 percent of rural Delta islands and tracts are protected by levees at or above the Bulletin 192-82/PL 84-99 standard, demonstrated by 2050.

OUTCOME PERFORMANCE MEASURE 7.5

Delivery Interruption

No water-delivery interruption due to floods or earthquakes in the Delta.

Why is this Measure Important?

The levees protecting Delta islands are important to California's water supply. The Delta levees form channels that convey water through the Delta to users in the Bay Area, San Joaquin Valley, or Southern California. Some levees prevent saltwater intrusion into Delta water supplies by forming a barrier between the Delta and the Bay. Should the levees that protect these channels fail, the impacts on water supplies could be felt statewide.

Investments in levees and emergency planning reduce the risk of disruption of water deliveries through the Delta due to levee failures caused by floods and earthquakes. This performance measure will track water-delivery interruptions resulting from hazardous conditions in the Delta.

Numbers and Goals

Metric	• Number of water-delivery interruptions caused by floods or earthquakes in the Delta. This performance measure will be assessed following any major floods or earthquakes in the Delta. • Acre-feet of water not delivered due to disruptions caused by floods or earthquakes in the Delta. This performance measure will be evaluated following any major floods or earthquakes in the Delta.
Baseline	Not applicable because this measure has a prescribed target and is not showing a change from a baseline.
Target	No water delivery interruptions. This target is to be achieved upon adoption of this performance measure.

ADDITIONAL INFORMATION

California is one of the most seismically active states in the country. Earthquakes are common and have at times been devastating. In the Delta, earthquakes could create floods. If one or more Delta levees were breached as a result of an earthquake, the Delta would experience flooding. Because in-Delta water users and exports from the Delta rely on levees for water conveyance, flooding from levee breaches, whether caused by earthquakes or something else, would put Delta water supply at risk.

OUTPUT PERFORMANCE MEASURE 7.6

Sea Level Rise Planning

Flood protection planning for new residential development in the Delta considers sea level rise.

Why is this Measure Important?

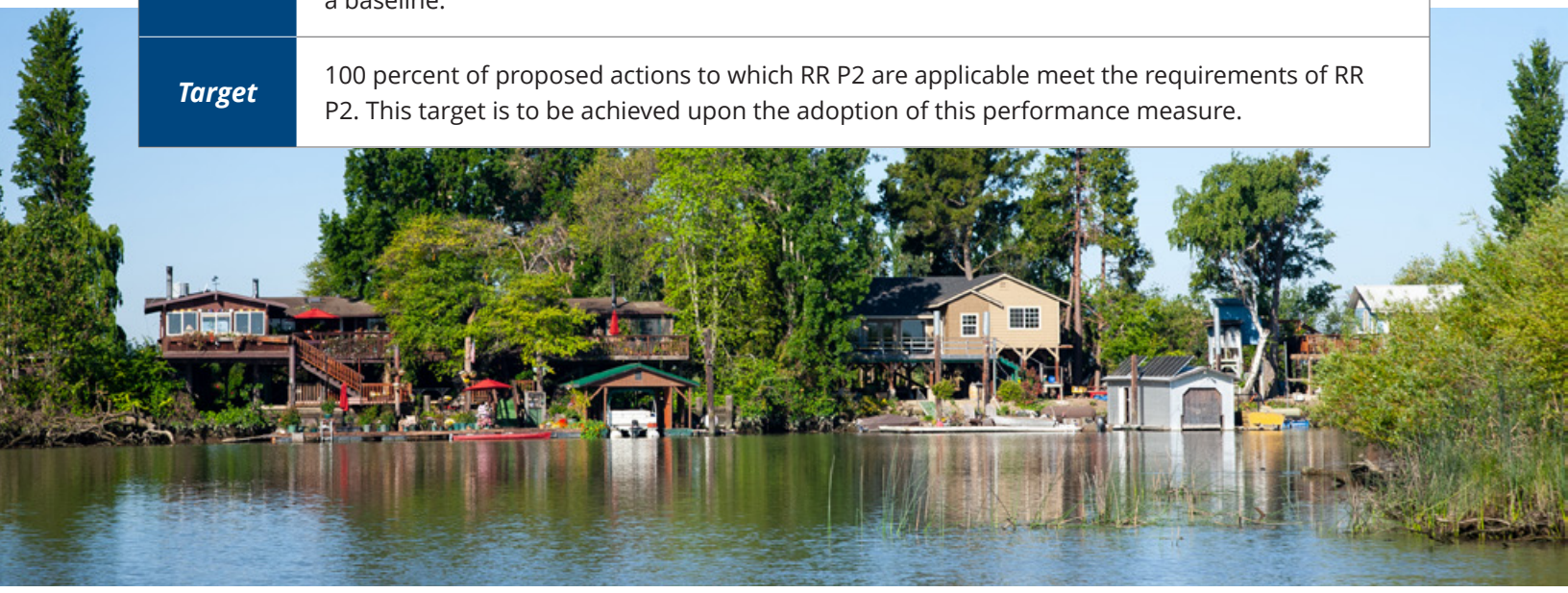
The Delta Reform Act requires the Delta Plan to promote appropriate land use in order to reduce the risks to people, property, and state interests in the Delta. Sea level rise, subsidence, and new residential development combine in the Delta to potentially put many more lives at risk. Delta Plan Policy RR P2 requires flood protection for new residential developments in rural areas. Under this policy, residential development cannot occur in rural areas of the Delta without adequate flood protection. The policy is intended to reduce risk while preserving the Delta's unique character and agricultural way of life.

In addition, the Delta Plan encourages those who live in the flood-prone areas of the Delta to have flood insurance and be aware of local emergency preparedness and response plans.

The measure will track the number of new residential developments and assess how current policies are being implemented in the field.

Numbers and Goals

Metric	Number of proposed actions covered by the Delta Plan policy to require flood protection for residential development in rural areas (RR P2). This performance measure will be evaluated as covered actions are submitted.
Baseline	Not applicable because this measure has a prescribed target and is not showing a change from a baseline.
Target	100 percent of proposed actions to which RR P2 are applicable meet the requirements of RR P2. This target is to be achieved upon the adoption of this performance measure.



OUTCOME PERFORMANCE MEASURE 7.7

Flood Insurance Community Rating

Community credit points in National Flood Insurance Program (NFIP) Community Rating System increase.

Why is this Measure Important?

In California, the state is liable for flood related damages caused by levee failures. The California Department of Water Resources in 2005 prepared the Flood Management White Paper outlining integrated approaches to reduce flood risks and included a recommendation to require houses and businesses to have flood insurance.

The NFIP provides an affordable insurance to property owners, renters, and businesses to reduce impacts of flooding on private and public structures. The NFIP uses a community rating system as a voluntary incentive program to encourage activities that exceed the minimum NFIP requirements.

The Community Rating System (CRS) allows communities to decrease the cost of flood insurance for their citizens by taking actions to reduce flood risk. Lowering premiums encourages greater flood insurance coverage throughout the community, which decreases both state and local liability.

This performance measure tracks progress in improving CRS scores.

Numbers and Goals

Metric	Community Rating System credit points of Delta communities participating in the NFIP. This will be evaluated at least every five years.
Baseline	Community Rating System credit points at the time of Delta Plan adoption, May 2013 or nearest available date.
Target	1 percent increase in Community Rating System credit points by 2025.

Performance Assessments

Inform management decisions and policy development, support science-based actions, and contribute to updates to the Delta Plan.

Viewing and Using the Performance Measures

Delta Plan performance measures track how well the goals, objectives, policies, and recommendations defined in the Delta Plan are being achieved and how conditions are changing through implementation of management actions.

Delta Plan performance measures allow the Council to integrate science and monitoring results into Delta-related decision-making and adaptive management of the Delta system.

Reporting on output and outcome performance measures is provided by an online application maintained by the Council. This web-based system focuses on tracking and reporting performance metrics, baselines, and targets for each measure using interactive graphs, charts, and maps. In addition, the website includes the tracking of administrative performance measures. Taken together, reporting on program actions, outputs, and outcomes provides informative, transparent, and accessible performance data about the Delta.

Delta Plan implementing agencies and the public can view the status of performance measures and understand the science-based story each measure tells about reaching the coequal goals and managing complexities within the Delta.

NOTE **The following tables list Delta Plan core strategies and recommendations with the associated performance measures.**

Delta Plan Chapter 3 | A More Reliable Water Supply for California		
Delta Plan Strategy	**Delta Plan Recommendation**	**Performance Measure**
Increase Water Conservation and Expand Local and Regional Supplies	**WR R1.** Implement Water Efficiency and Water Management Planning Laws **WR R2.** Require SWP Contractors to Implement Water Efficiency and Water Management Laws **WR R3.** Compliance with Reasonable and Beneficial Use **WR R4.** Expanded Water Supply Reliability Element **WR R5.** Develop Water Supply Reliability Element Guidelines **WR R6.** Update Water Efficiency Goals **WR R7.** Revise State Grant and Loan Priorities **WR R8.** Demonstrate State Leadership	**3.1** Urban Water Use **3.2** Alternative Water Supply **3.4** Water Supply Reliability **3.6** Agricultural Water Planning
Improve Groundwater Management	**WR R9.** Update Bulletin 118, California's Groundwater Plan **WR R10.** Implement Groundwater Management Plans in Areas that Receive Water from the Delta Watershed **WR R11.** Recover and Manage Critically Overdrafted Groundwater Basins	**3.8** Sustainable Groundwater
Improve Conveyance and Expand Storage	**WR R12a.** Promote Options for New and Improved Infrastructure Related to Water Conveyance **WR R12b.** Evaluate, Design, and Implement New or Improved Conveyance or Diversion Facilities in the Delta **WR R12c.** Improve or Modify Through-Delta Conveyance **WR R12d.** Promote Options for New or Expanded Water Storage **WR R12e.** Design, Construct and Implement New or Expanded Surface Water Storage **WR R12f.** Implement New or Expanded Groundwater Storage **WR R12g.** Promote Options for Operations of Storage and Conveyance Facilities **WR R12h.** Operate Delta Water Management Facilities Using Adaptive Management Principles **WR R12i.** Update the Bay-Delta Plan and Consider Drought **WR R12j.** Operate New or Improved Conveyance and Diversion Facilities Outside of the Delta **WR R12k.** Promote Water Operations Monitoring Data Management and Data Transparency **WR R13.** Complete Surface Water Storage Studies **WR R14.** Identify Near-term Opportunities for Storage, Use, and Water Transfer Projects **WR R15.** Improve Water Transfer Procedures	**3.9** Water Exports

Delta Plan Chapter 4 | Protect, Restore, and Enhance the Delta Ecosystem		
Delta Plan Strategy	**Delta Plan Recommendation**	**Performance Measure**
Create More Natural Functional Flows	**ER R1.** Update Delta Flow Objectives	**4.2a** Yolo Bypass Inundation **4.2b** Peak Flow **4.2c** Recession Flow **4.2d** In-Delta Flow
Restore Ecosystem Function	**ER RA.** Increase Public Funding for Restoring Ecosystem Function	**4.14** Increased Funding for Restoring Ecosystem Function **4.15** Seasonal Inundation **4.16** Acres of Natural Communities Restored
Protect Land for Restoration and Safeguard against Land Loss	**ER RC.** Fund Targeted Subsidence Reversal Actions **ER RD.** Funding to Enhance Working Landscapes **ER RE.** Develop and Update Management Plans to Halt or Reverse Subsidence on Public Lands	**4.12** Subsidence Reversal for Tidal Reconnection
Protect Native Species and Reduce the Impact of Non-native Invasive Species	**ER R7.** Prioritize and Implement Actions to Control Non-native Invasive Species **ER R8.** Manage Hatcheries to Reduce Risk of Adverse Effects **ER R9.** Coordinate Fish Migration and Survival Research **ER RH.** Prioritize Unscreened Diversions within the Delta **ER RI.** Fund Projects to Improve Survival of Juvenile Salmon	**4.6** Salmon Doubling Goal **4.10** Terrestrial and Aquatic Invasive Species **4.13** Fish Passage
Improve Institutional Coordination to Support Implementation of Ecosystem Protection, Restoration, and Enhancement	**ER RF.** Support Implementation of Ecosystem Restoration **ER RG.** Align State Restoration Plans and Conservation Strategies with the Delta Plan	**4.14** Increased Funding for Restoring Ecosystem Function **4.16** Acres of Natural Communities Restored

Delta Plan Chapter 5 | Protect and Enhance the Unique Cultural, Recreational, Natural Resource, and Agricultural Values of the California Delta as an Evolving Place		
Delta Plan Strategy	**Delta Plan Recommendation**	**Performance Measure**
Plan to Protect the Delta's Lands and Communities	**DP R3.** Plan for the Vitality and Preservation of Legacy Communities **DP R4.** Buy Rights of Way from Willing Sellers When Feasible **DP R5.** Provide Adequate Infrastructure **DP R6.** Plan for State Highways **DP R7.** Subsidence Reduction and Reversal	**5.2** Subsidence Reversal and Carbon Sequestration **5.5** Legacy Communities **5.3** Farmland Loss
Maintain Delta Agriculture	**DP R8.** Promote Value-added Crop Processing **DP R9.** Encourage Agritourism **DP R10.** Encourage Wildlife-Friendly Farming	**5.3** Farmland Loss **5.9** Delta Economy
Encourage Recreation and Tourism	**DP R11.** Provide New and Protect Existing Recreation Opportunities **DP R12.** Encourage Partnerships to Support Recreation and Tourism **DP R13.** Expand State Recreation Areas **DP R14.** Enhance Nature-based Recreation **DP R15.** Promote Boating Safety **DP R16.** Encourage Recreation on Public Lands **DP R17.** Enhance Opportunities for Visitor-serving Businesses	**5.6** Recreation Opportunities **5.8** Delta Tourism
Sustain a Vital Delta Economy	**DP R18.** Support the Ports of Stockton and West Sacramento **DP R19.** Plan for Delta Energy Facilities	**5.9** Delta Economy

Delta Plan Chapter 6 | Improve Water Quality to Protect Human Health and the Environment		
Delta Plan Strategy	**Delta Plan Recommendation**	**Performance Measure**
Require Delta-Specific Water Quality Protection	**WQ R1.** Protect Beneficial Uses **WQ R2.** Identify Covered Action Impact **WQ R3.** Special Water Quality Protections for the Delta	**6.1** Delta Water Quality **6.10** Harmful Algal Blooms
Protect Beneficial Uses by Managing Salinity	**Refer to Chapter 4's ER P1**	**6.2** Salinity
Improve Drinking Water Quality	**WQ R4.** Complete Central Valley Drinking Water Policy **WQ R5.** Complete North Bay Aqueduct Alternative Intake Project **WQ R6.** Protect Groundwater Beneficial Uses **WQ R7.** Participation in Central Valley Salinity Alternatives for Long-Term Sustainability	**6.3** North Bay Aqueduct **6.4** Protect Groundwater
Improve Environmental Water Quality	**WQ R8.** Completion of Regulatory Processes, Research, and Monitoring for Water Quality Improvements **WQ R9.** Implement Delta Regional Monitoring Program **WQ R10.** Evaluate Wastewater Recycling, Reuse, or Treatment **WQ R11.** Manage Dissolved Oxygen in Stockton Ship Channel **WQ R12.** Manage Dissolved Oxygen in Suisun Marsh	**6.5** Dissolved Oxygen **6.7** Critical Pesticides **6.8** Inorganic Nutrients **6.9** Measurable Toxicity **6.10** Harmful Algal Blooms

Delta Plan Chapter 7 | Reduce Risk to People, Property, and State Interests in the Delta		
Delta Plan Strategy	**Delta Plan Recommendation**	**Performance Measure**
Improve Emergency Preparedness and Response	**RR R1.** Implement Emergency Preparedness and Response	**7.1** Multi-Hazard Coordination Task Force **7.2** Flood Casualties and Damages
Prioritize Flood Management Investment		**7.3** Delta Levees **7.5** Delivery Interruptions
Improve Residential Flood Protection	**RR R8.** Maintain Lower Risk Uses of Flood-Prone Rural Lands	**7.6** Sea level rise planning
Limit Liability	**RR R13.** Require Flood Insurance **RR R14.** Improve Delta Communities' National Flood Insurance Program Community Rating System (CRS) Program Rankings **RR R15.** Limit State Liability	**7.7** Flood Insurance Community Ratings

Delta Plan Performance Measures

Measuring progress in achieving the coequal goals of a reliable water supply for California and a healthy Delta ecosystem

The Coequal Goals

The Delta Stewardship Council was created in legislation to achieve the state mandated coequal goals for the Delta.

"Coequal goals" means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem.

The coequal goals shall be achieved in a manner that "protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place."
(CA Water Code §85054)