San Francisco ESTUARY PARTNERSHIP
sfestuary.org

MEMO

DATE: January 18, 2022

TO: Implementation Committee

FROM: SFEP Staff

RE: Agenda Item 4 – 2022 Estuary Blueprint Update

At the last Implementation Committee meeting on November 16, 2021, staff provided a detailed presentation on the Estuary Blueprint update process to date, including a summary overview of the 25 updated draft actions.

The following provides a summary of progress since the November 16th IC meeting, with further details to be provided at the January 25th Implementation Committee meeting.

- **Working Groups**. SFEP staff continued to coordinate with working group members as well as additional experts to refine tasks and identify task leads and collaborating partners.
- **Public Input.** The 2022-2017 Estuary Blueprint Draft Actions were released for public input on December 8, 2021. The initial public input period deadline was January 7, 2022 and was then extended to January 21, 2022.
- **Steering Committee.** The Estuary Blueprint Update Steering Committee met in December 2021 and again in January 2022 to guide the overall process, review draft language, and discuss public input to date.

Attached is the revised draft of the 2022-2027 Estuary Blueprint Actions. The attached draft reflects revisions to the public draft to: 1) further refine task and milestone language; 2) include background information for each action, and; 3) identify task leads and collaborating partners (table of partners included as an attachment).

Additional changes approved by the Steering Committee at their January 13 meeting based on public input received to date that are *not reflected* in the attached draft include the following:

- **Action 7 – Carbon Management.** Support and promote carbon sequestration in the Bay as well as the Delta by revising Task 7-2 to support applied research in both the Delta and Bay regions.
- **Action 15 – Invasive Species.** Acknowledge that invasive species prevention programs address specific vectors including ballast water by revising Task 15-1 to list key vectors.
- **Action 22 – Health Risks of Fish.** Revise action title to read “Reduce human health risks due to legacy contaminants and contaminants in fish” and revise shorthand title to read “Health Risks of Contaminants“ to better reflect the range of tasks that focus both on fish consumption risks as well as toxic sites more broadly.

- **Action 23 – Trash.** Add two additional tasks: 1) Implement the Municipal Regional Permit (regarding trash capture specifically); and 2) Remove abandoned and derelict vessels. Both new tasks are currently under development with partners.

Additional minor edits to the attached draft actions in response to public and partner input will be included in the Final Draft 2022-2027 Estuary Blueprint, for consideration at the March 16, 2022 Implementation Committee meeting. All public comments will be made available to the Implementation Committee prior to the March 16 meeting. The Final Draft will also include all additional sections of the complete Estuary Blueprint such as the Introduction, Findings, and Spotlights.

SAN FRANCISCO ESTUARY BLUEPRINT

DRAFT ACTIONS

SAN FRANCISCO Estuary Blueprint

January, 2022

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ATTACHMENT 1

ACTION 1
CLIMATE RESILIENCE

Plan for increased climate resiliency that incorporates natural resource protection.

Facilitate regional planning efforts to understand and address climate change impacts and advance climate adaptation that emphasizes the protection of natural resources.

TASK 1-1

Implement the Bay Adapt Joint Platform to advance climate adaptation in the lower Estuary that supports protection of the Estuary's resources and its communities.

MILESTONE
Release a "vision statement" for the Bay shoreline that sets a long-term picture of successful adaptation; regional and sub-regional objectives; regional and sub-regional strategies and actions; and guidelines and methodologies for evaluating local plans and projects for funding and other incentives.

TASK 1-2

Complete and implement Delta Adapts to advance climate adaptation in the upper Estuary that supports protection of the Estuary's resources and its communities.

MILESTONE
Complete the Delta Adapts Adaptation Strategy.

TASK 1-4

Explore establishment of new, or modification of existing, regulatory authority to protect shoreline habitats and open space while pursuing measures to protect communities and infrastructure from climate impacts.

MILESTONE
Establish collaborative working group and develop an Impact and Needs Analysis.

TASK 1-5

Establish an independent Climate Science Consortium that supports needed science and provides high-quality science translation to advance adaptation and resource protection.

MILESTONE
Establish a Climate Science Consortium.

TASK 1-7

Fund and support completion of robust, coordinated city and county-level adaptation plans that prioritize natural features and ecosystem processes as resiliency strategies.

MILESTONE
Complete 5 local adaptation plans that include strategies for protecting natural areas.

TASK 1-8

Study the potential influence of rising sea level on groundwater elevations (and contaminated sites) within counties using an interpolated groundwater model based on empirical measurements.

MILESTONE
Complete groundwater data model for 9 counties.

GOALS

TASK 1-3

Include, elevate, and center decision-making around frontline and underserved voices for planning, policy, and projects that improve the health of the Estuary by supporting the establishment of a Regional Climate Resilience Equity Consortium run by community-based organizations to provide participation and input on an as-needed basis for climate resilience planning, policy and implementation projects.

MILESTONE

Develop a workplan including tasks, a cost estimate, and funding analysis for a Regional Climate Resilience Equity Consortium.

TASK 1-6

Expand the use of the Adaptation Atlas to support analysis and selection of adaptation strategies within Operational Landscape Units (OLUs) to support natural resource protection and advancement of nature-based strategies.

MILESTONE

Engage with stakeholders within 1-2 OLUs per year to interpret the Adaptation Atlas and support selection of adaptation strategies.

Action 1 (Climate Resilience) Overview

The Estuary needs robust climate resilience planning to guide major collaborative action in the decades to come. This Action responds to the climate crisis and accelerates regional climate adaptation by setting regional objectives and guidelines, supporting critical climate change science, and advancing adaptation planning at the local level. Natural resources protection and restoration is a key component of a regional response to climate change.

Updates and Emerging Issues

Since 2016, much progress has been made in climate resilience planning, including completion of local and regional vulnerability assessments (including Adapting to Rising Tides Regional Sea Level Rise Vulnerability and Adaptation Study and Delta Adapts Vulnerability Assessment) and advancement of adaptation strategies (such as Bay Adapt Joint Platform and Delta Adapts Adaptation Plan). The updated Action supports and advances ongoing efforts for regional climate resilience planning with a focus on natural resource protection.

Climate Change Considerations

The unpredictability and scale of climate change impacts will be felt regionally, so any planning that enhances resilience will need to be collaborative and coordinated. This Action recognizes the urgency of the climate crisis while exploring long-term solutions that sustain precious ecosystem processes.

Equity Considerations

Climate resilience and adaptation projects will need to pay special attention to social equity, since planning and implementing large projects to prepare the physical environment for sea level rise will inevitably affect the economic and social dimensions of its inhabitants. Furthermore, it is critical that agencies work in partnership with community leadership to address priority concerns through natural and nature-based solutions.

Connections to Other Actions

Climate resilience shares intersections with many other Actions in the Blueprint, but is most closely connected with:

A2: Equity

A3: Adaptation Planning

A4: Adaptation Projects

A5: Watershed Connections

A9: Subtidal Habitats

A10: Tidal Marsh

A11: Transition Zones

A19: Stormwater

ACTION 2 EQUITY

Elevate frontline and Indigenous communities in planning for and benefiting from a healthy, resilient Estuary.

Support the role that Indigenous and frontline communities play in advancing Estuary health and resilience by advancing equity through regional strategies, including building capacity for government agencies and for organizations with deep roots in frontline and underserved communities.

TASK 2-1

Develop a living network of Bay Area community-based organizations to foster collaboration and increase equity in planning and permitting decisions.

MILESTONE

Launch a pilot Community-Based Organization Directory Map with a requisite training module.

TASK 2-2

Build the capacity of community members and community-based organizations to be active leaders in improving the health of the Estuary, including funding, grant-making, and grant-writing assistance to result in restoration project planning, design, and implementation.

MILESTONE

Fund 20 projects that build the capacity of frontline and underserved communities to plan and implement projects.

TASK 2-4

In partnership with Tribes, develop Best Management Practices (BMPs) for incorporating cultural knowledge and resource needs into the design and implementation of habitat restoration and nature-based shoreline adaptation projects.

MILESTONE

Develop and distribute a BMPs manual for dissemination to project managers and funders, including holding up to three workshops to train audiences in use of BMPs.

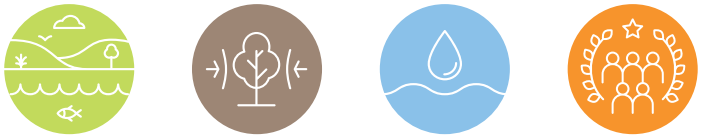
TASK 2-5

Conduct a racial equity analysis of the 2022 Estuary Blueprint to inform the next update or revision.

MILESTONE

Report analyzing racial equity in the 2022 Estuary Blueprint.

GOALS



TASK 2-3

In partnership with frontline and underserved communities, and potentially in tandem with the Community-Based Organization Directory module, develop strategies or Best Management Practices for incorporating community priorities into the design and implementation of habitat restoration and nature-based shoreline adaptation projects.

MILESTONE

Develop and distribute a BMPs manual for dissemination to project managers and funders, including holding up to three workshops to train audiences in use of BMPs.

Action 2 (Equity) Overview

ATTACHMENT 1

The people that live throughout the Estuary are a part of its history and future; they have an impact on it as much as this ecosystem has an impact on them. Without meaningful efforts to create equity in our work, our mission to protect, restore, and enhance the Estuary can result in disproportionate impacts to frontline communities, Black people, Tribes and Indigenous people, and people of color. This Action commits the actors in the region to listen, support, and work collaboratively with these underserved populations for the purpose of creating a healthier Estuary for all.

Updates and Emerging Issues

This is a new Action that acknowledges the importance of environmental justice and equity in the Estuary Blueprint's vision.

Climate Change Considerations

Climate change will disproportionately affect marginalized communities, so it is imperative that local and regional government works in tandem with these communities work to plan, design, and implement resilience projects.

Equity Considerations

To adequately address environmental injustice in our work, it is important to prioritize equity implicitly and explicitly in the Estuary Blueprint. This Action explicitly dedicates the region to more equitable policies, processes, and outcomes.

Connections to Other Actions

While many Actions include considerations to equity in their Tasks and Milestones, this Action is most closely connected with:

A1: Climate Resilience

A3: Adaptation Planning

A4: Adaptation Projects

A14: Creeks

A16: Freshwater Flows

A20: Nutrients

A22: Health Risks of Fish

A24: Public Access

A25: Champion

ACTION 3 ADAPTATION PLANNING

Overcome challenges to accelerate implementation of climate adaptation projects that prioritize natural and nature-based strategies.

Remove barriers that stand in the way of implementing projects that prepare and adapt the Estuary's ecosystems and communities for climate change. Barriers to the implementation of projects that address climate change include lack of technical expertise and data, lack of funding, and regulatory policies and processes.

TASK 3-1

Implement community-based climate adaptation solutions that prioritize natural resources by supporting frontline communities and community-based organizations as full partners and leaders in adaptation planning and implementation.

MILESTONE

Fund the participation and leadership of community-based organizations and frontline communities in adaptation planning and implementation.

TASK 3-2

Establish a technical assistance "help desk" network that coordinates programs and entities to provide data and technical assistance for climate change adaptation for cities, counties, and other stakeholders that facilitates natural resource protection.

MILESTONE

Identify entities and information needed to promote natural resource protection through an established regional "help desk."

TASK 3-4

Strengthen and improve the ability of the San Francisco Bay Restoration Regulatory Integration Team (BRRIT) to accelerate projects and incentivize nature-based approaches.

MILESTONE

Develop solutions for 1-3 high priority issues identified by the BRRIT's Policy Management Committee.

TASK 3-5

Further integrate resilience and natural resource protection into Plan Bay Area by restructuring Association of Bay Area Governments/Metropolitan Transportation Commission's Priority Conservation Area Program to advance natural and nature-based strategies for climate resilience.

MILESTONE

Restructure Association of Bay Area Governments/Metropolitan Transportation Commission's Priority Conservation Area Program.

TASK 3-7

Align Federal Emergency Management Agency hazard planning with climate adaptation planning to secure funding for protection of habitats and use of natural and nature-based strategies.

MILESTONE

Submit 15 grant applications to Federal Emergency Management Agency Building Resilient Infrastructure and Communities (BRIC) and/or other Federal Emergency Management Agency grant programs for nature-based adaptation projects.

GOALS

TASK 3-3

Revise regulatory policies, guidelines, or regulations to accelerate natural and nature-based adaptation projects consistent with the overall protection of the health of the Estuary, such as the San Francisco Bay Conservation & Development Commission's policies on sediment management and Suisun Marsh Protection Plan, Regional Water Quality Control Boards' sediment reuse and climate change policies, and Delta Stewardship Council's Delta Plan climate change policies.

MILESTONE

Revise three policies, guidelines, or regulations to facilitate natural or nature-based adaptation projects.

TASK 3-6

Increase funding for adaptation planning and implementation that values long-term protection of habitats and communities.

MILESTONE

Complete a sea level rise adaptation funding and investment framework for the San Francisco Bay Area.

Action 3 (Adaptation Planning) Overview

Advancing natural and nature-based infrastructure is a key strategy to the timely implementation of climate resilience projects. However, there are many barriers that stand in the way of projects so desperately needed by the Estuary's ecosystems and communities. The lack of technical expertise, data, and funding all hinder projects from being implemented in a timely manner. Additionally, regulatory and permitting processes for these innovative projects can be cumbersome, conflicting, or out-of-date given quickly changing conditions.

Updates and Emerging Issues

While much progress has been made since 2016 with regard to implementing climate adaptation projects, significant challenges remain that threaten our region's ability to respond to the urgency of current and future climate change impacts. This revised action seeks to identify and address current barriers that impede timely implementation of shoreline natural and nature-based climate adaptation strategies.

Climate Change Considerations

The unpredictability and scale of climate change impacts will be felt regionally, so any planning that enhances resilience will need to be collaborative and coordinated. This Action recognizes the urgency of the climate crisis while exploring long-term solutions that sustain precious ecosystem processes.

Equity Considerations

This Action focuses on overcoming barriers to accomplishing natural and nature-based infrastructure, which includes building the capacity of frontline communities to be active leaders and collaborators in project planning an implementation.

Connections to Other Actions

Natural and nature-based infrastructure planning shares intersections with many other Actions in the Blueprint, but is most closely connected with:

A1: Climate Resilience

A2: Equity

A4: Adaptation Projects

A5: Watershed Connections

A9: Subtidal Habitats

A10: Tidal Marsh

A11: Transition Zones

ACTION 4 ADAPTATION PROJECTS

Implement climate adaptation projects that prioritize natural and nature-based strategies.

Facilitate the implementation of climate adaptation projects that prioritize natural and nature-based strategies to proactively address emerging climate change issues, such as sea level rise and saltwater intrusion.

TASK 4-1

Advance design of shoreline and bank adaptation projects or pilot projects using natural or nature-based approaches, including horizontal levees, living shorelines, transition zones, and other innovative design approaches.

MILESTONE
Complete design of ten projects.

TASK 4-2

Advance implementation of shoreline and bank adaptation projects using natural or nature-based approaches.

MILESTONE
Complete implementation of ten projects.

TASK 4-4

Spatially track shoreline adaptation projects to help communicate the region's progress, facilitate planning, evaluate project design and costing, and identify opportunities for local community input and use of nature-based adaptation strategies.

MILESTONE
Launch the Shoreline Adaptation Project Tracker Map within EcoAtlas for San Francisco Bay.

TASK 4-5

Share best practices, data, information, and lessons learned to advance implementation of nature-based infrastructure by expanding the Transforming Urban Waters Initiative to include additional types of natural and nature-based adaptation approaches.

MILESTONE

Host 1-2 collaborative meetings per year to address barriers to implementation for individual nature-based adaptation projects.

GOALS

TASK 4-3

Enhance existing subtidal and intertidal artificial structures or design features into new structures that better provide space for and protect native species and habitats. Explore design modifications to develop green-grey approaches to modify existing and create new improvements to traditional grey infrastructure (riprap, seawalls, levees, etc.).

MILESTONE

Implement 15 pilot projects that include green-grey habitat enhancement features.

Action 4 (Adaptation Projects) Overview

Natural and nature-based shoreline infrastructure consists of existing or restored landscapes such as tidal marshes and floodplains, as well as engineered systems that incorporate natural features or processes. Natural and nature-based infrastructure provides multiple benefits including flood protection, habitat, improved water quality, and recreational benefits, and is integral to the efficacy of sea level rise adaptation and ecosystem restoration. Living shorelines, as a type of nature-based infrastructure that often includes subtidal and intertidal habitats such as oyster reefs and eelgrass beds, can not only mitigate wave action preventing storm surges, but also provide important ecosystem functions for wildlife and shoreline communities. Accelerating the implementation of natural and nature-based infrastructure projects is a key climate adaptation strategy.

Updates and Emerging Issues

This revised action builds on Action 3 to facilitate and track implementation of climate adaptation projects.

Climate Change Considerations

The diversity of ecosystems and habitats in the San Francisco Estuary increases the resilience of the entire system, but also needs a holistic and regional approach in climate resilience planning to support that diversity.

Equity Considerations

This Action recognizes the importance of community input and buy-in for the implementation of natural and nature-based infrastructure to address climate resilience and adaptation needs.

Connections to Other Actions

Natural and nature-based infrastructure implementation shares intersections with many other Actions in the Blueprint, but is most closely connected with:

A2: Equity

A3: Adaptation Planning

A4: Adaptation Projects

A5: Watershed Connections

A9: Subtidal Habitats

A10: Tidal Marsh

A11: Transition Zones

ACTION 5 WATERSHED CONNECTIONS

Restore watershed connections to the Estuary to improve habitat, flood protection, and water quality.

Plan and implement projects and programs that connect watersheds to the Estuary to enhance habitats, natural processes, and ecosystem services. Potential benefits may include: tidal, intertidal, and open water habitat restoration; flood management; water quality improvement; fish passage and food supply; wave energy reduction; groundwater recharge; sediment delivery; wildfire management; and recreational opportunities.

TASK 5-1

Advance a watershed-based approach to landscape management to align management activities addressing nonpoint source pollution control, reservoir management, stormwater management, groundwater management, water supply planning, sediment management, flood management, compensatory mitigation, voluntary restoration, and climate change adaptation.

MILESTONE

Identify a demonstration watershed and convene a council of its principal managers to explore how existing tools, datasets and appropriate numerical models can be used to develop coordinate management activities in the demonstration watershed that provide multiple benefits.

TASK 5-2

Increase the use of planning tools and guidance documents developed for multi-benefit projects that restore watershed connections by improving the understanding of and access to such tools and documents.

MILESTONE

Hold 3-6 workshops on multi-benefit habitat restoration and flood management that provides a comprehensive review of the most recent tools and guidance documents available to environmental planners and practitioners.

TASK 5-4

Engage reservoir and dam operators to identify opportunities to increase sediment supply to lower parts of watersheds through sediment routing, flushing flows, excavation, and removal of unused or inoperable dams.

MILESTONE

Complete a report that inventories dams within the Estuary region that have planned capital improvements, major maintenance, or retrofit projects planned and identify management measures for these facilities each system to that will increase sediment supply to lower parts of the watershed and increased fish passage.

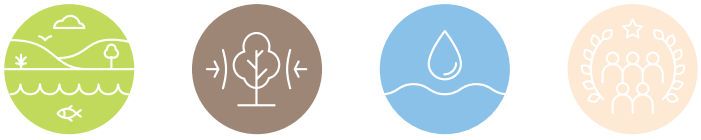
TASK 5-5

Develop a regional coarse sediment strategy to identify sources, reuse methods and locations, and logistical, financial and regulatory challenges and develop management techniques for moving sediment trapped in flood control channels into bay margin ecosystems.

MILESTONE

Complete a San Francisco Bay regional coarse sediment strategy that identifies potential need for and sources of coarse sediment and publish a scientific report that identifies the opportunities and barriers for transporting sediment in flood control channels to their marshes through natural processes where possible and through active interventions where not possible.

GOALS



TASK 5-3

Advance the use and implementation of sediment management principles and approaches at the Bay margins identified in the 2021 Sediment for Survival Report to improve sediment supply and conveyance in the Operational Landscape Units (OLUs) with the greatest potential for tributary sediment supply to meet demands given appropriate intervention.

MILESTONE

Identify and convene a meeting of the stakeholders for one Operational Landscape Unit (OLU) with the greatest potential for tributary sediment supply to meet demands given appropriate intervention to demonstrate OLU partnership structures and to advance sediment transportation planning in that OLU.

Action 5 (Watershed Connections) Overview

Historically, watershed connections such as creeks and floodplains have provided important transition zones and habitat for wildlife, rich sediment and organic matter for diverse tidal marshlands, improved groundwater percolation for increased water quality, and robust absorbent properties for runoff capture and flood control. Over time, humans have modified these important watershed connections in ways that now disrupt the natural exchange of water and sediment that nourishes complex habitat mosaics for native wildlife.

Updates and Emerging Issues

Since 2016, this Action has been updated to align with the findings and recommendations from the 2021 Sediment for Survival Report. The tasks integrate an Operational Landscape Unit (OLU) framework into a watershed-based approach to manage the geophysical and jurisdictional complexity of the Bay shoreline. Such a framework also advances sediment transport in systems with high potential for supplying sediment to the shoreline, given appropriate intervention. Also, this Action now focuses on leveraging and encouraging natural ecosystem processes to accomplish watershed connectivity where flood control channels have disrupted natural sediment delivery to the Bay margins.

Climate Change Considerations

Significant amounts of sediment will be needed to combat the threat of drowning wetlands due to sea level rise. Improving watershed connection, and thus sediment deposition, will have the potential to reduce flood hazards to frontline communities, whose flood control infrastructure is frequently outdated or failing.

Equity Considerations

This Action recognizes the importance of community input and buy-in for the implementation of natural and nature-based infrastructure to address climate resilience and adaptation needs.

Connections to Other Actions

Watershed connections provide unique habitat and ecosystem services closely related to or dependent upon:

A1: Climate Resilience

A3: Adaptation Planning

A4: Adaptation Projects

A6: Sediment

A7: Carbon Management

A11: Transition Zones

A14: Creeks

A19: Stormwater

ACTION 6 SEDIMENT

Manage sediment and soil on a regional scale and advance beneficial use.

Manage fine and coarse mineral sediments and upland soils on a watershed and regional scale to enhance Estuary habitats and shoreline flood protection efforts and develop tools and convening structures for regional sediment coordination for beneficial reuse. Conduct research on enhancement of natural processes through design with nature approaches to promote sediment transport and the impacts of sediment dredging techniques to inform regulatory policy. Identify and coordinate new funding opportunities to increase beneficial reuse of dredged sediment and for regional monitoring programs to support and increase ongoing planning and implementation of sediment management for beneficial reuse.

TASK 6-1

Increase the amount of beneficial reuse of dredged sediment by maximizing implementation of the Long-Term Management Strategy (LTMS) beneficial reuse goal, through scientific evaluation of dredging and beneficial reuse impacts to inform permitting and regulatory policy.

MILESTONE

Evaluate the net impacts/benefits of beneficially reusing sediment from hydraulic dredging and, if deemed appropriate under the San Francisco Bay Regional Water Quality Control Board's California Environmental Quality Act (CEQA) analysis, incorporate beneficial reuse of hydraulically dredged material into the US Army Corps of Engineers multi-year permit.

TASK 6-2

Pilot shallow water placement of sediment in restoration projects and conduct pre and post placement modeling and monitoring such that the regulatory agencies can evaluate the benefits and impacts.

MILESTONE

Complete the 2016 Water Resources Development Act Resilient San Francisco Bay Strategic Placement Project shallow water placement project and associated monitoring.

TASK 6-4

Improve coordination of dredged sediment supply with demand to reduce sediment disposal and increase beneficial use through convening a long-term working group that includes restoration community practitioners, dredgers, and regulators to coordinate a regional approach and develop a programmatic roadmap for beneficial use opportunities and increasing the use of SediMatch by dredgers and restoration practitioners.

MILESTONE

Convene 1-2 meetings of interagency working group and 1-3 workshops with small dredgers.

TASK 6-5

Secure federal and non-federal (state and local) long-term funding sources for the incremental cost of beneficial use of dredged sediment beyond the US Army Corps of Engineers least cost alternatives (Federal Standard), including costs to deliver and place sediment at beneficial use projects on the Estuary's shoreline.

MILESTONE

Establish a long-term funding program cost-shared with federal and non-federal funds, for the incremental cost of beneficial use of dredged sediment for projects across the Estuary.

TASK 6-7

Synthesize research and data on sediment supply and demand under various future climate scenarios in the upper Estuary to inform future sediment management and monitoring considerations.

MILESTONE

Publish a report on sediment supply and demand analysis for the upper Estuary.

GOALS

TASK 6-3

Address contaminant screening criteria and risk assessment methodology for dredged sediment and upland soils.

MILESTONE

Revise the San Francisco Bay Regional Water Quality Control Board's Draft Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines and Master Quality Assurance Project Plan for upland material reuse at the Don Edwards San Francisco Bay National Wildlife Refuge.

TASK 6-6

Fund research efforts to address the 16 critical knowledge gaps identified in the 2021 Sediment for Survival Report.

MILESTONE

Publish 4-6 research papers addressing sediment demand for vertical accretion, lateral movement of sediment, sediment supply, and organic matter accumulation.

Action 6 (Sediment) Overview

Sediment provides the fundamental building material for estuarine ecosystems, habitat restoration, and shoreline protection. While watersheds naturally transport sediment with stream and river flows, human activities such as channeling, damming, and shoreline development have led to a dramatic decrease in the Estuary's sediment supply. Moreover, most dredged sediment is not beneficially reused – this critical issue must be resolved for the region to meet its restoration goals and to adapt to sea level rise. This Action has been updated to prioritize the responsible and beneficial reuse of dredged materials for restoration.

Updates and Emerging Issues

The 2021 Sediment for Survival Report has articulated the urgent needs, possible sources, and practical methods of meeting the Estuary's demand for more sediment.

Climate Change Considerations

Sediment is a requirement for tidal marshes particularly in the Bay to successfully adapt to rising sea levels; it is also in critically short supply. Without overcoming regulatory, financial, and jurisdictional hurdles, the region will not be able to deliver enough sediment to restoration projects to allow wetlands to accrete quickly enough over time to outpace sea level rise. The ability of the region's environments and communities to adapt to the impacts of climate change will be greatly diminished if the sediment supply issue is not successfully resolved soon.

Equity Considerations

Communities that inhabit Estuary margins are considered frontline communities to climate change, due to their vulnerability to the impacts of sea level rise, while also often consisting of communities of color and lower income. Restoring tidal marshes is a critical adaptation strategy to protect frontline communities and will require significant increase in sediment supply.

Connections to Other Actions

As one of the key components to the resilience of San Francisco Estuarine habitats, sediment is inextricably linked to the restoration of tidal habitats and all their geophysical and ecological benefits. Consequently, this Action connects to many Actions within the Blueprint, with special relevance to:

A1: Climate Resilience

A3: Adaptation Planning

A4: Adaptation Projects

A5: Watershed Connections

A7: Carbon Management

A9: Subtidal Habitats

A10: Tidal Marsh

A14: Creeks

A16: Freshwater Flows

ACTION 7
CARBON MANAGEMENT

Decrease carbon emissions and increase carbon sequestration on natural and agricultural lands.

Sequester carbon through wetland restoration, enhancement, and creation projects to slow or reverse subsidence of agricultural lands, reduce greenhouse gases in the atmosphere, and advance scientific understanding of carbon sequestration. Projects should focus on converting the more subsided locations on conversion to managed wetlands and in less subsided locations on conversion to tidal wetlands.

TASK 7-1

Work with agencies and willing private landowners to obtain funding to plan and implement activities in the deeply subsided regions of the Delta that re-saturate the highly organic peat soils to reduce or halt greenhouse gas emissions caused by subsidence.

MILESTONE
Implement projects that halt subsidence and related greenhouse gas emissions on 20,000 acres of deeply subsided lands in the Delta.

TASK 7-2

Continue to conduct applied research to better understand the processes of carbon sequestration and greenhouse gas emissions generated from wetlands and open water systems in the Bay-Delta. Work within reference systems and utilize scenario testing to inform management and restoration approaches that can be applied at larger scales. Quantify the greenhouse gas fluxes from different types of wetlands and different management regimes.

MILESTONE
Complete 1 – 3 scientific papers on the carbon implications of land management and wetland restoration activities in the Delta, including analyzing greenhouse gas fluxes being emitted from different types of wetlands, wetland restoration techniques, the impacts of aquatic invasive species on carbon sequestration in wetlands, and other associated management activities that affect greenhouse gas emissions and storage.

TASK 7-4

Advance research on submerged aquatic vegetation (SAV) and its potential for carbon management in the Estuary.

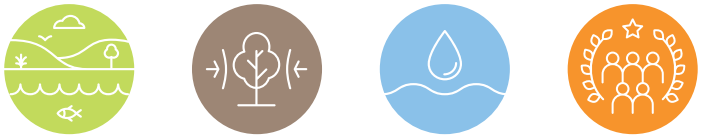
MILESTONE
Complete at least one scientific paper on the impacts of submerged aquatic vegetation on carbon management and the potential of native SAVs to provide sustained carbon storage.

TASK 7-5

Collect more data on San Francisco Bay carbon cycles, fluxes, and fates across a variety of ecosystems and land use types, including restored wetlands, to address gaps in our understanding of carbon sequestration in Bay systems.

MILESTONE
Secure funding for and establish 1 - 3 study sites with atmospheric and hydrologic carbon exchange measurements combined with soil sediment data collection that encompass the diversity of Bay area wetlands with regard to age, disturbance and salinity.

GOALS



TASK 7-3

Increase economic impact of carbon markets in the estuary to advance wetland restoration and management goals.

MILESTONE

Prepare a report detailing the potential impacts and benefits of various co-management activities on lands included in the carbon market, various strategies to scale participation in the market through regionally coordinated applications for multiple sites, and the institutional and regulatory barriers that limit entry of wetland restoration and agriculture projects into the carbon market.

TASK 7-6

Promote use of carbon credit funding for wetland restoration in the Estuary.

MILESTONE

Implement a pilot tidal wetland restoration project that uses American Carbon Registry Standards to qualify for the voluntary carbon market.

Action 7 (Carbon Management) Overview

Wetlands play an important role in the global carbon cycle: they act as major carbon sinks due to their large standing biomass and their ability to capture and retain carbon in the form of peat. Carbon sequestration, through the restoration, enhancement, and creation of wetlands, can also reduce net greenhouse gas emissions and prevent further subsidence — a huge issue in the Delta. Former wetlands in the Delta have been diked off and drained, resulting in subsided organic soils 25 feet below sea level. These soils are a primary target for carbon management efforts in the Delta as they actively release greenhouse gases that can be attenuated through soil saturation.

Updates and Emerging Issues

Since 2016, this Action has shifted towards implementation. Additionally, agencies are looking for innovative ways to integrate carbon credits and multi-use lands into effective carbon sequestration practices. Many experts agree that accessing the carbon market is a difficult task in land management and carbon sequestration efforts, but it will be critical to creating a regional approach for funding restoration projects. Recent scientific studies have provided data on carbon fluxes in Bay Area wetland systems, but the scientific community has stressed that more data is needed to better understand carbon fluxes and life cycles in these systems before large scale carbon management measures can be deployed with certainty. These studies have shown that Bay Area wetlands are effective at sequestering carbon and release very limited quantities of methane, making them prime candidates for carbon credit funding. The Social Cost of Carbon is an emerging concept in the Bay Area that estimates the long-term economic damages resulting from greenhouse gas emissions and should be directly addressed in future Actions and Tasks.

Climate Change Considerations

Restoring wetlands can dramatically increase the land's ability to sequester carbon and mitigate the effects of greenhouse gases in the atmosphere. However, in current climate models, rising seas are projected to threaten and drown wetlands that cannot accrete quickly enough to outpace sea level rise and in deeply subsided lands in the Delta, creating unvegetated mud flats that do not have the capability of producing biomass and storing carbon at all. Conducting research about carbon storage in different habitats can help accelerate and prioritize restoration that enhances carbon storage.

Equity Considerations

Since global climate change disproportionately impacts frontline communities, carbon sequestration activities can mitigate negative impacts by directly reducing atmospheric carbon levels.

Connections to Other Actions

Carbon sequestration is an important ecosystem benefit provided by wetlands that helps mitigate excess carbon in the atmosphere. Thus, this Action is related closely to:

A1: Climate Resilience
A3: Adaptation Planning
A4: Adaptation Projects
A6: Sediment
A8: WRMP
A10: Tidal Marsh
A11: Transition Zones
A12: Managed Wetlands

ACTION 8
WETLAND MONITORING

Implement a Wetlands Regional Monitoring Program.

Implement a Wetlands Regional Monitoring Program (WRMP) for the Bay Area and the Delta to help local, regional, state, and federal agencies evaluate the effectiveness of efforts to sustain healthy aquatic habitats and resources

TASK 8-1

Develop the WRMP Monitoring Network through the establishment of benchmark, reference, and restoration project sites.

MILESTONE
Establish five monitoring sites with biogeographic representation within San Francisco Bay.

TASK 8-2

Understand how efforts to restore tidal marshes affect the distribution, abundance, and health of plants and animals and coordinate with related monitoring efforts, including the State of the Birds reporting.

MILESTONE
Establish 1-2 Standard Operating Procedures for biological and ecological indicators.

TASK 8-4

Ensure that WRMP outreach and engagement includes diverse audiences. Increase engagement with community representatives, social science and community-based science, and traditional ecological knowledge on the Steering Committee, Technical Advisory Committee, and in development of ecosystem services indicators to track wetland restoration benefits to communities. Examples of ecosystem services may include cultural use, recreation, education and training opportunities, and flooding protection.

MILESTONE
Develop Standard Operating Procedures to measure benefits of wetland restoration projects to people.

TASK 8-5

Strengthen partnerships and monitoring coordination between the Lower and Upper San Francisco Estuary.

MILESTONE
Establish a workgroup to increase coordination between the Delta Interagency Ecological Program and the WRMP Technical Advisory Committee.

GOALS

TASK 8-3

Identify sustainable funding for the WRMP to support science, data management, and administration, and develop a strategy that is tied to the sources of funding.

MILESTONE

Identify and secure three to five new funding sources for the WRMP.

Action 8 (Wetlands Monitoring) Overview

The Wetlands Regional Monitoring Program (WRMP) will improve understanding of the condition of tidal wetlands at a regional scale and support the design, implementation, and adaptive management of restoration projects. Monitoring and analysis will address landscape-scale drivers impacting restored and mature wetlands to help inform climate change adaptation and priority responses at a regional level. The WRMP development process was initially started with the 2016 Estuary Blueprint revision and has fostered regional support for the program. The Program engages a broad range of stakeholders, including regulators, land managers, scientists and community-based organizations.

Updates and Emerging Issues

Revised and new Tasks reflect next steps to move the program from development to implementation and increase its relevance to broader stakeholder groups.

Climate Change Considerations

Climate change will not directly impact implementation of the WRMP; however, the vulnerability of tidal wetlands to climate stressors (see Action 8) makes the role of the WRMP in evaluating changes and recommending management actions more essential. Additionally, Bay wetlands have been shown to have significant carbon management benefits and are an important part of the Bay Area's efforts to manage greenhouse gasses. Thus, the protection, restoration, and adaptive management of wetlands will be critical in the region's adaptation to and mitigation of climate change.

Equity Considerations

Task 8.4 specifically focuses on incorporating an equity lens into the WRMP, including engaging new stakeholders and expertise on Committees, in outreach, and in development of ecosystem services indicators.

Connections to Other Actions

The WRMP improves management of habitats addressed in the following Actions:

A9: Subtidal Habitats

A10: Tidal Marsh

A11: Transition Zones

A12: Managed Wetlands

A13: Seasonal Wetlands

The WRMP may also contribute information to guide efforts in:

A5: Watershed Connections

A6: Sediment

A15: Invasive Species

ACTION 9
INTERTIDAL/ SUBTIDAL HABITATS

Protect, restore, and enhance intertidal, tidal flat, and subtidal habitats.

Protect, restore, and enhance non-tidal marsh intertidal, unvegetated tidal flat, and subtidal habitats to improve ecological complexity and completeness, and to deliver ecosystem services and water quality benefits to the Estuary.

TASK 9-1

Determine habitat suitability for native eelgrass in context with potential future climate changes in San Francisco Bay. Learn, respond, and adapt strategies to account for natural variability and climate change stressors.

MILESTONE
Complete Habitat Suitability Model for Eelgrass in San Francisco Bay.

TASK 9-2

Increase populations of Submerged Aquatic Vegetation (SAV), with a focus on native eelgrass (Zostera marina), by expanding the extent of existing beds and establishing new beds on the Bay.

MILESTONE
Increase SAV coverage in the Bay by 75 acres.

TASK 9-4

Work with the San Francisco Bay Restoration Regulatory Integration Team (BRRIT) to raise awareness amongst regulatory agencies on the status of eelgrass, oyster, and other types of subtidal habitat restoration and benefits documented to date; and advance discussions on any permitting issues with respect to native oyster (Ostrea lurida), gravel beach, and other restoration projects.

MILESTONE
Create a programmatic framework with US Army Corps of Engineers and the San Francisco Bay Conservation and Development Commission for permitting native oyster restoration projects.

TASK 9-5

Restore non-tidal marsh intertidal and subtidal habitats other than eelgrass and oyster beds, such as rocky intertidal areas, coarse sediment beaches, macroalgal beds, and living shorelines. Identify appropriate and feasible sites, secure funds, and implement projects to create or improve these types of habitats as well as other projects that integrate multiple habitats.

MILESTONE
Implement 20 projects that focus on rocky intertidal, course sediment beach, macroalgal bed, living shorelines, and other integrated habitats.

TASK 9-7

Protect and enhance tidal flat habitats to be healthy and free of debris; functionally and physically linked to tidal wetland and/ or open Estuary sites; and able to sustain diverse species of bay invertebrates and local and migratory shorebirds.

MILESTONE
Include tidal flat enhancement and protection in 10 restoration site designs.

GOALS

TASK 9-3

Increase populations, including as use for living shorelines, of native oysters (Ostrea lurida) by expanding the extent of existing beds or establishing new beds.

MILESTONE
Implement 20 projects that increase shellfish beds.

TASK 9-6

Remove artificial structures that are known to contribute to shoreline debris, water quality degradation and which provide minimal habitat benefit (i.e., derelict creosote pilings, failing seawalls, failing riprap).

MILESTONE
Implement 10 projects that include the removal of artificial structures.

Action 9 (Intertidal/Subtidal Habitats) Overview

Non-wetland intertidal, tidal flat, and subtidal habitats are productive, important components of the Estuary ecosystem due to their ability to shelter, support, and attract biodiversity in benthic invertebrates, small fish, crabs, and shorebirds. This Action supports the restoration goals in the 2010 San Francisco Bay Subtidal Habitat Goals Report in order to achieve improved biodiversity, resilience, and water quality. Examples of non-wetland intertidal, tidal flat, and subtidal habitats include: oyster reefs, eelgrass beds, macroalgal beds, mudflats, rocky areas, and coarse sediment beaches.

Updates and Emerging Issues

Since 2016, this Action has expanded to include the removal or enhancement of artificial structures to explore their potential for increasing habitability for wildlife. Additionally, this Action now acknowledges the importance of both integrated and isolated species restoration approaches – eelgrass beds and oyster reefs are of particular interest since they can be considered ecosystem "engineers". Looking forward to 2027, this Action may contain new Tasks that address erosion from expanded Bay ferry routes.

Climate Change Considerations

The definition of intertidal and subtidal habitats mean that they will be affected by sea level rise. Locations that have little area for migration, such as the Central Bay, will be at higher risk of drowning due to sea level rise when compared to project locations in more spacious areas, such as the North and South Bays. Additionally, intertidal and subtidal habitats are particularly vulnerable to other aspects of climate change, such as ocean acidification and temperature increases, which impact ecosystem engineers such as oysters and eelgrass.

Equity Considerations

As with other habitat types, projects to restore tidal flat and subtidal habitats should engage Tribes and frontline communities in planning and implementation; tasks under the Climate Resilience and Equity actions address this need.

Connections to Other Actions

Since the restoration of intertidal and subtidal habitats provide many ecosystem services, this Action is connected to other Actions that are focused on multi-benefit, nature-based projects, such as:

A1: Climate Resilience

A3: Adaptation Planning

A4: Adaptation Projects

A6: Sediment

A11: Transition Zone

A12: Managed Wetlands

A15: Invasive Species

A16: Freshwater Flows

ACTION 10 TIDAL MARSH

Protect, restore, and enhance tidal marsh habitat.

Protect, restore, and enhance complete tidal marsh ecosystems taking into account sea level rise and other climate change stressors in the restoration design.

TASK 10-1

Restore high quality tidal marsh habitat in the Estuary as part of multi-objective projects with diverse partners. Take into consideration sea level rise and potential climate adaptation design components during the design and permitting process.

MILESTONE

Restore 26,000 acres of tidal marsh in SF Bay and 5,500 acres of tidal marsh in the Delta.

TASK 10-2

Protect San Francisco Bay historical baylands (tidal marsh and non-tidal wetlands and waters) to support preservation and enhancement of tidal habitats and adjacent habitats to allow for migration with sea level rise.

MILESTONE

Protect 20,000 acres of baylands through various mechanisms including transfer of fee title, donation, or easement.

GOALS

TASK 10-3

Enhance tidal marsh, including constructing and enhancing transition zones and high tide refugia features such as marsh islands, to increase ecological function and resilience to climate change.

MILESTONE

Enhance 3,000 acres of tidal marsh in San Francisco Bay.

Action 10 (Tidal Marsh) Overview

Tidal marshes offer diverse ecosystem services to the San Francisco Estuary and its communities through their abilities to provide habitat for wildlife, stabilize shorelines, prevent erosion, absorb stormwater, and store carbon. Today, there are approximately 51,300 acres of tidal marsh in the Bay -- about a quarter of the acreage that existed at the beginning of the 19th century. This Action seeks to increase tidal marsh area to 100,000 acres in the Bay as set forth in the 1999 Baylands Ecosystem Habitat Goals Report, and to 50,000 acres in the Delta by 2050 as set forth by the Delta Plan.

Updates and Emerging Issues

Tidal marshes and other Bay wetlands have been shown to have significant carbon management benefits and are an important part of the Bay Area's efforts to manage greenhouse gasses. Sea level rise and other climate change stressors provide additional hurdles to the restoration of tidal marshes. The updated protective and enhancement milestones work in-tandem with Actions 8: Wetland Monitoring and 11: Transition Zones to increase the pace and scale of restoration, develop recommendations for climate-resilient restoration, and support the migration of tidal marshes upland as sea levels rise.

Climate Change Considerations

The definition of intertidal and subtidal habitats mean that they will be affected by sea level rise. Locations that have little area for migration, such as the Central Bay, will be at higher risk of drowning due to sea level rise when compared to project locations in more spacious areas, such as the North and South Bays. Additionally, intertidal and subtidal habitats are particularly vulnerable to other aspects of climate change, such as ocean acidification and temperature increases, which impact ecosystem engineers such as oysters and eelgrass.

Equity Considerations

Ecosystem restoration and enhancement projects need to consider and incorporate the priorities of surrounding communities. Additionally, such projects should take into special consideration that many tidal marsh habitats carry great cultural significance and provide important resources to Tribes and Indigenous populations.

Connections to Other Actions

The restoration and enhancement of tidal marsh habitat and other similar habitats hold great potential for increasing climate resilience. This Action is closely connected with Actions that expedite the implementation of natural and nature-based infrastructure to address climate change:

A1: Climate Resilience
A3: Adaptation Planning
A4: Adaptation Projects
A5: Watershed Connections
A6: Sediment
A7: Carbon Management
A9: Subtidal Habitat
A11: Transition Zone
A12: Managed Wetlands
A15: Invasive Species

ACTION 11 TRANSITION ZONES

Protect, restore, and enhance estuarine-upland transition zones and adjacent upland ecosystems.

Protect estuarine-upland transition zones, and their ecosystem services, to help the Estuary adapt to rising sea levels. Include protection of adjacent upland ecosystems and diked historic baylands where feasible and appropriate. Integrate transition zones and adjacent upland ecosystems into restoration and enhancement projects in the Estuary to provide both migration space and high water refugia.

TASK 11-1

Enhance, restore, or create estuarine-upland transition zones in existing or restored tidal marshes.

MILESTONE

Incorporate 75 transition zone enhancement, restoration, or creation projects into existing or restored marshes and adjacent uplands.

TASK 11-2

Protect transition zones, adjacent upland areas, and diked historic baylands for wetland migration space, based on identified needs and opportunities, through acquisition of fee title, partnerships to develop conservation easements, or other management agreements.

MILESTONE

Protect, or plan to protect, 45 sites as areas for future wetland migration space.

TASK 11-4

Address the challenges of restoring native plant communities in the transition zone by supporting information-sharing and knowledge transfer activities. Topics may include sourcing native plants; designing, preparing, and maintaining sites; monitoring; and addressing plant pathogens.

MILESTONE

Hold 3-5 workgroup meetings to address transition zone restoration challenges.

GOALS

TASK 11-3

Determine an approach for maintaining an updated estuarine-upland transition zone mapping inventory over time. Integrate the approach into long-term monitoring by the Wetlands Regional Monitoring Program (WRMP) through approval by the WRMP Steering Committee and publication on the WRMP website. Identify opportunities to coordinate with the Delta Adapts and Delta Plan Ecosystem Amendment analyses.

MILESTONE

Develop and publish Standard Operating Procedures for completing periodic mapping of Bay transition zones.

Action 11 (Transition Zones) Overview

Efforts to address the ecological and economic threats imposed by sea-level rise and other aspects of climate change have begun to focus on the estuarine-terrestrial transition zone in areas above the current and future water lines Estuarine-upland transition zones are defined as existing and predicted areas of interaction among tidal, terrestrial, and fluvial processes that result in unique mosaics of habitat types, assemblages of plant and animal species, and ecosystem services. Some non-tidal areas can also provide similar functions and services to estuarine-upland transition zones.

Updates and Emerging Issues

Since 2016, this Action has recognized the increasing importance of connectivity between habitat types. It has expanded its scope to include adjacent upland ecosystems and diked historic baylands in recognition of the similar functions and services that these areas can provide as sea level rises and transition zones migrate.

Climate Change Considerations

Climate change will directly impact transition zones due to their vulnerability to sea level rise. If managed properly, transition zones can accommodate Bay expansion without loss of ecosystem services provided by tidal marshland. Protection of adjacent upland areas can help accommodate upland migration of transitional habitat with sea level rise and maintain significant carbon management benefits provided by tidal marshlands and other wetlands that are an important part of the Bay Area's efforts to manage greenhouse gasses.

Equity Considerations

Transition zones are home to many sites of cultural significance to Tribes and Indigenous populations. They also hold great potential ecosystem benefits to frontline communities, such as their ability to mitigate flood hazards and provide access to nature and recreational opportunities.

Connections to Other Actions

As areas of interaction between many different habitat types, this Action is closely connected to Actions focused on specific habitats, including:

A9: Subtidal Habitats

A10: Tidal Marsh

A12: Managed Wetlands

A13: Seasonal Wetlands

A14: Creeks

Due to the importance of transition zones for boosting resilience to sea level rise, this Action is also closely connected with Actions that expedite the implementation of natural and nature-based infrastructure to address climate change:

A1: Climate Resilience

A3: Adaptation Planning

A4: Adaptation Projects

A5: Watershed Connections

ACTION 12 MANAGED WETLANDS

Maximize habitat benefits of managed ponds and other non-tidal wetlands and waters.

Maximize habitat benefits of managed ponds and other non-tidal wetlands and waters for a wide range of species. Support studies and actions to enhance and expand bird use of managed ponds and other aquatic habitats, and minimize negative impacts to aquatic species and water quality to inform long-term improvements and management options to sustain these species.

TASK 12-1

Analyze the management of ponds and other non-tidal waters and wetland habitats to provide increased successful nesting, foraging, roosting, and high tide refugia. Investigate the effectiveness of specific habitat enhancement measures such as management of water levels, predation control, varied pond topography, and island construction.

Collaborate to plan, fund, conduct, and report on repeatable surveys for 3-5 years following implementation of substantial enhancements or changes in configuration, management, or operation of ponds or other non-tidal waters and wetland habitat.

MILESTONE
Five reports summarizing the results of the studies.

TASK 12-2

Fund, implement, and monitor managed pond enhancements to increase nesting waterbirds success and grow populations.

MILESTONE
Three projects to implement and test techniques, and monitoring reports on outcomes.

TASK 12-4

Develop a methodology for assessing the risk-adjusted long-term costs and benefits of managed ponds, managed wetlands, and non-tidal wetlands and waters. Methodology should take into account habitat benefits for multiple species and changes in operations and maintenance requirements to adapt to sea level rise and climate change and prevent water quality impacts. In the upper Estuary, the methodology should also account for the cost/benefit of how the water is “sourced” and how the actions impact partners.

MILESTONE
Develop and test a methodology and evaluate it for future use across the region.

TASK 12-5

Develop and implement predation control measures on managed ponds. These measures include camouflaging habitats and installing exclusion fencing.

MILESTONE
Develop, test, and implement measures at five sites.

GOALS

Living Resources | Resilience | Water | Stewardship

TASK 12-3

Study the ability of managed ponds and other non-tidal habitats to sustain diverse species of vertebrates, invertebrates, and endemic and endangered plants over time. Analyze species use, density, and diversity as compared to tidal wetlands..

MILESTONE

Produce a report comparing species use and diversity in various managed ponds and other non-tidal habitats and share results.

Action 12 (Managed Wetlands) Overview

For more than a century, humans have managed marsh and pond habitats to attract waterfowl for hunting. More recently, diked former wetlands and salt ponds are being retained and enhanced to managed ponds that address subsidence issues, species protection goals, and restoration priorities. Managed ponds (shallow or deep open water areas) provide valuable habitat for critical vegetation, small mammals, and a wide variety of waterbirds. Managed wetlands (such as diked marshes) can provide habitat for critical vegetation, marsh-dependent birds, and small mammals where full tidal restoration is not feasible.

Updates and Emerging Issues

Since 2016, this Action has been expanded to include managed wetland and inundated floodplain habitats, and has shifted its focus to balancing the benefits of such habitats between waterbirds and fish. Tasks and milestones pertaining to integrated predator control have been moved to Action 15: Invasive Species.

Climate Change Considerations

The effects of climate change and sea level rise challenge the long-term viability of managed ponds. Projected higher water levels, more frequent and intense storms, and regional salinity shifts may make it difficult or even impossible in the future for managers to maintain target habitat conditions inside the ponds, which may become subtidal habitat. Tasks under this Action will help evaluate the costs and benefits of maintaining these areas under climate change scenarios to inform future management.

Equity Considerations

Transition zones are home to many sites of cultural significance to Tribes and Indigenous populations. They also hold great potential ecosystem benefits to frontline communities, such as their ability to mitigate flood hazards and provide access to nature and recreational opportunities.

Connections to Other Actions

Managed ponds can expand valuable habitat for diverse species of flora and fauna when other habitat types are not available, like the habitats addressed in:

A8: WRMP

A9: Subtidal Habitats

A10: Tidal Marsh

A11: Transition Zones

A14: Creeks

ACTION 13 SEASONAL WETLANDS

Protect, restore, and enhance seasonal wetlands.

Protect, restore and enhance non-tidal seasonal wetlands including vernal pool complexes outside of historic tidal areas using conservation easements and related protection tools, restoration, and improved grazing management practices.

TASK 13-1

Protect non-tidal seasonal wetlands including vernal pool complexes using conservation easements or other protection tools.

MILESTONE

Protect at least 1500 acres of seasonal wetlands in the Bay region.

TASK 13-2

Restore non-tidal seasonal wetlands including vernal pool complexes.

MILESTONE

Restore at least 800 acres of seasonal wetlands in the Bay region and 3,200 acres in the Delta region.

GOALS

TASK 13-3

Advance best practices (including wildlife friendly stock ponds) for grazing management to protect seasonal wetlands and enhance habitat quality.

MILESTONE

Hold four workshops around the region for landowners.

Action 13 (Seasonal Wetlands) Overview

Seasonal wetlands can be found upland and are called "seasonal" because they periodically flood or fill with rain, runoff, or groundwater during winter rains. Their salinities lie on a spectrum of salty to fresh, since many seasonal wetlands may be former tidal marshes that have been closed off from tidal action by the construction of dikes and levees. Seasonal wetlands also provide habitat for large numbers of waterfowl and shorebirds during migratory periods, and support rare and endangered plants and invertebrates.

Updates and Emerging Issues

Since 2016, this Action's Tasks have been expanded to cover seasonal wetlands more generally: not just vernal pool complexes. Also, this Action's protection and restoration Tasks are now aligned with the goals of The Conservation Lands Network 2.0 Report and San Francisco Bay Joint Venture. Looking ahead to the next Estuary Blueprint revision, this Action is expected to explore more opportunities to partner with landowners around grazing management and forest management best practices.

Climate Change Considerations

Climate change will bring more extreme and unpredictable weather to the region. Extended dry periods and prolonged or extreme flooding may result in the increased precariousness of seasonal wetlands.

Equity Considerations

Like other habitat-oriented Actions, projects to restore seasonal wetlands should engage Tribes and frontline communities in planning and implementation. Tasks under the Climate Resilience and Equity actions address this need.

Connections to Other Actions

This Action is connected to other Actions focused on restoring, protecting, and conserving habitat, including:

A8: WRMP

A9: Subtidal Habitat

A10: Tidal Marsh

A11: Transition Zones

A14: Creeks

ACTION 14 CREEKS

Conserve and enhance riparian and in-stream habitats throughout the Estuary's watersheds.

Conserve stream reaches and restore riparian habitats by defining impairments and threats, filling data gaps, developing science-based tools, securing necessary funding, and designing, advancing, and collaborating on projects.

TASK 14-1

Establish advisory group to assess the capacities of regional restoration tracking platforms, such as EcoAtlas and EcoRestore to include riparian and aquatic in-stream habitat restoration project metrics not typically measured in acreage. Consider additional metrics and data fields beyond acreage/miles of corridor restored, such as benthic macroinvertebrate indicators, canopy cover, native riparian plant species, fish barrier removal, gravel augmentation, restored access for fish rearing on floodplains and other off-channel habitats, carbon sequestration, required pre/post project monitoring data, and costs by funding source.

MILESTONE

Convene advisory group and identify new metrics to add to regional data sets.

TASK 14-2

Compile and provide technical and policy guidance to the watershed restoration community and decision-makers to accelerate the pace and scale of riparian and in-stream habitat restoration and protection. This guidance potentially includes stream and watershed data, characterization of key habitat areas for salmonids and other native fish assemblages, development setback policies, erosion control and regenerative and firewise landscaping measures, land acquisition/conservation easements, unplanned chloramine and firefighting chemical discharges, and best practices for community engagement in restoration stewardship, maintenance, and monitoring support.

MILESTONE

Establish an on-going advisory group to identify and recommend appropriate guidance documents and develop an engagement strategy using Bay Area Watershed Network as primary convener of and audience for multi-platform technical transfer effort (emails, workshops, and website).

TASK 14-4

Implement riparian corridor and in-stream habitat restoration/enhancement and conservation/acquisition/preservation projects throughout the Bay-Delta region emphasizing multi- objective and -benefit efforts.

MILESTONE

Conserve 5,000 acres of upland habitat and creek corridor; restore/enhance 2,000 acres of riparian corridor and in-stream habitat.

TASK 14-5

Pilot the use of cooperative working arrangements among homeless advocacy organizations, local government, and watershed organizations to create a stream steward program comprised of people experiencing homelessness at a creekside encampment (to be selected). The program would provide stipends, stewardship training and resources, potable water and sanitary services, and connection to available social services. This approach would provide resources for both protecting the waterway and support services to find long-term housing for unsheltered participants.

MILESTONE

Initiate pilot program.

GOALS

TASK 14-3

Seek additional funding for Bay and Delta riparian conservation & restoration activities including for floodplain acquisition, establishment of a network of streamflow gauges; conduct of fish population surveys with a focus on anadromous salmonid streams, and long-term public engagement such as watershed planning and project stewardship.

MILESTONE

Develop annual lists of prospective riparian acquisition and conservation actions, budding restoration projects, needed data collection efforts, and other watershed management requests to help policymakers secure and allocate regional, state, and federal funding.

Action 14 (Creeks) Overview

ATTACHMENT 1

Habitats in and around rivers are extremely important to frogs, turtles, and iconic California fish species such as salmon and steelhead trout. The restoration of riparian habitats also reduces flood-risk and improves watershed connectivity. While this action emphasizes critical in-stream habitat, it also supports efforts to daylight stream reaches and restore urban waterways.

Updates and Emerging Issues

Since 2016, many of the Tasks and Milestones for this Action were not accomplished due to a lack of funding and ownership. To address these issues, this Action has shifted its emphasis away from fisheries towards riparian restoration and seeks to activate the Bay Area Watershed Network (Bay Area Watershed Network) as a center point for its revised Tasks and Milestones.

Climate Change Considerations

Local creeks and rivers hold cultural and ecological significance for Tribal members and Tribal groups. Tribal participation and consideration of traditional ecological knowledge should be woven into all Action Tasks. Underhoused populations that reside along creeks are also major stakeholders in riparian restoration. Synergies between riparian restoration efforts and unhoused and underhoused populations can be found through cooperative stewardship arrangements, housing organizations, and social service providers.

Equity Considerations

Like other habitat-oriented Actions, projects to restore seasonal wetlands should engage Tribes and frontline communities in planning and implementation. Tasks under the Climate Resilience and Equity actions address this need.

Connections to Other Actions

Creeks are important to wildlife, underhoused populations, and geological and fluvial processes in the Estuary's watershed. Thus, this Action is closely connected to:

A2: Equity

A5: Watershed Connections

A6: Sediment

A16: Freshwater Flows

ACTION 15 INVASIVE SPECIES

Minimize the impact of invasive species.

Reduce the impact of invasive species through prevention, early detection, rapid response, eradication and control. Conduct work with national, state, and regional coordinating bodies and the key agencies implementing specific programs.

TASK 15-1

Maintain, expand, and improve invasive species prevention programs. Actions may include developing new or expanding existing policies and programs, conducting outreach (i.e., boating community, Weed Management Areas, etc.), and working with existing bodies to identify priority activities.

MILESTONE

Develop new or expand 3 existing polices or programs, identify and list priority activities in various programs, and implement 3 outreach campaigns through pertinent networks.

TASK 15-2

Increase early detection, monitoring, and rapid response programs by identifying additional funding sources and creating a Rapid Response Fund. Monitoring includes: 1) assessing and mapping Estuary-wide distribution of key invasive species; and 2) increasing citizen scientist monitoring through Calflora, iNaturalist, and other similar websites.

MILESTONE

Establish rapid response fund and identify 3-4 funding sources for monitoring and/or mapping.

TASK 15-4

Develop new early detection tools using eDNA (i.e., eDNA meta barcoding) for specific environments and suites of species (i.e., marine species)

MILESTONE

Develop pilot eDNA meta barcoding or other eDNA technique for early detection.

TASK 15-5

Implement eradication and control programs with priority given to species that can be eradicated and/or species that have extensive impacts on habitats important to the health of the estuarine ecosystem. Research and test pilot control measures for key invasive species.

MILESTONE

Reduce acreage of key invasive species; and/or increase acres being managed to reduce key invasive species.

TASK 15-7

Work with U.S. Army Corps of Engineers to update the National Ocean and Atmospheric Association Fisheries programmatic biological opinion on vectors for invasive species (i.e., overwater structures, dredging, etc.), to ensure they incorporate pertinent Best Management Practices (BMPs) to reduce the introduction and spread of invasive species (i.e., BMPs for Marine Mobile Infrastructure).

MILESTONE

Update at least one of NOAAs programmatic biological opinions to incorporate pertinent BMPs.

GOALS

Living Resources | Resilience | Water | Stewardship

TASK 15-3

Develop Early Detection and Rapid Response Frameworks (EDRR). This can be done at the local or national scale and involves setting up a framework to detect and respond to invasive species and sets up a series of sustained and coordinated actions with associated responsible agencies and partners.

MILESTONE

Create at least one EDRR Framework.

TASK 15-6

Work with regulatory agencies and project proponents to make sure they include requirements to prevent the introduction and spread of invasive species, including using native-only plant lists, using sources with a clean supply of native plant species that are free of pathogens, and confirming that Best Management Practices (BMPs) are shared for invasive species where they exist (for example: Invasive Spartina Project BMPs 2016, CSLC BMPs for marina leases).

MILESTONE

Reduce acreage of key invasive species; and/or increase acres being managed to reduce key invasive species.

Action 15 (Invasive Species) Overview

Invasive species threaten native species and the delicate habitats of the Estuary. While vector management and prevention is the best and most cost-effective method for reducing the impact of invasive species, once invasive species are detected, this Action calls for a rapid response that includes coordinated eradication and monitoring. While this Action supports existing initiatives and programs to control invasive species, it also targets key invasive species to the Estuary such as invasive Spartina alterniflora.

Updates and Emerging Issues

While this Action supports working through existing organizing and coordinating bodies such as the Federal Aquatic Nuisance Species Task Force and the California Department of Fish and Wildlife's Aquatic Invasive Species Program, this Action has also included new Tasks and Milestones such as the pilot use of eDNA, the development of an Early Detection Rapid Response framework, and an update to National Oceanic and Atmospheric Administration's biological opinion of marine mobile infrastructure as vectors for invasive species.

Climate Change Considerations

Invasive species negatively impact biodiversity and ecosystem services, thus destabilizing a habitat's resilience to climate change. Additionally, climate change can exacerbate the proliferation of many invasive species in the Estuary due to warmer climates and longer growing seasons. Looking to the future, invasive prevention and early detection programs will play key roles in invasive management due to climate change's tendency to favor certain invasive species.

Equity Considerations

Invasive species may displace culturally significant plants and animals for Tribes and can interfere with significant activities — such as subsistence fishing -- on which vulnerable populations might rely. In addition, invasive species control and eradication efforts can have unintended economic and other impacts on frontline and underserved communities if an equity lens is not applied.

Connections to Other Actions

Invasive species can be accidentally introduced during restoration activities, particularly dredging and planting. Thus, this Action is closely connected to:

A5: Watershed Connections

A6: Sediment

A9: Subtidal Habitats

A0: Tidal Marsh

A11: Transition Zones

A12: Managed Wetlands

A13: Seasonal Wetlands

A14: Creeks

ACTION 16
FRESHWATER FLOWS

Improve the timing, amount, and duration of freshwater flows critical to Estuary health.

Inform elected officials, Tribes, and the public, including frontline communities, about the critical importance of freshwater flows from the watershed through the Estuary. Work with partners and through other Estuary Blueprint actions to adjust the timing, amount, and duration of freshwater flows as part of a more natural flow regime through the Delta and San Francisco Bay to better support all public trust uses.

TASK 16-1

Assist the State Water Resources Control Board in updating and implementing the San Francisco Bay/Sacramento-San Joaquin River Delta Water Quality Control Plan (Bay-Delta WQCP) by providing timely and scientifically sound information to the State Board during its deliberations and by keeping the public, Tribes, and local officials informed.

MILESTONE
Complete distribution of information to assist with completion of the Bay-Delta Water Quality Control Plan for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary.

TASK 16-2

Initiate research to assess critical ecological connections between the inland (Bay-Delta-Central Valley watershed) and coastal portions of the Estuary, including but not limited to:

- The relationship between the freshwater plume from San Francisco Bay to nearshore waters and the abundance, distribution and other population viability attributes of coastal fish and wildlife.
- The relationship between flows and salmon abundance; the health of the Southern Resident population of orca (Orcinus orca); and the abundance of various runs of Chinook salmon (Oncorhynchus mykiss) originating in the upper Estuary's watersheds (Sacramento River and Central Valley ESUs).

MILESTONE
Issue 1-2 technical papers describing the initial findings, as well as a white paper synthesizing overall findings for a lay audience.

TASK 16-4

Undertake a study to assess the social, cultural, and economic values, including non-monetary values, of freshwater flows to residents of the Estuary and beyond, including Tribes.

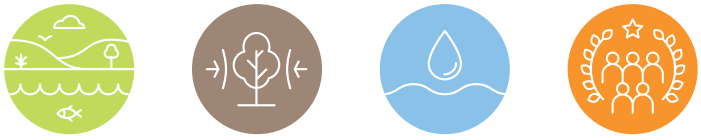
MILESTONE
Report synthesizing values of freshwater flows.

TASK 16-5

Develop instream flow management recommendations for the Sacramento and San Joaquin Rivers and the Delta to protect Chinook Salmon (with reference to other native coldwater species), based on a synthesis of the existing scientific literature, including new studies and data from the last three years

MILESTONE
One or more technical reports consisting of recommendations, distributed to decision-makers, managers, Tribes, and the public.

GOALS



TASK 16-3

Integrate Tribal priorities regarding improvements to freshwater flows, such as pursuing legal personhood for traditional waterway and incorporating Traditional Ecological Knowledge into water management and decision-making for tributaries of the San Francisco Estuary. Support Tribes in capacity development to co-manage or lead freshwater flows resources management.

MILESTONE

Hold at least one convening of Tribes and Tribal organizations to review state data and plans, including opportunities for Tribe-to-Tribe conversations, in preparation for meeting with state agencies at the Tribal Water Summit or similar event.

TASK 16-6

Explore potential collaboration on freshwater flows priority needs and populations of endangered species with other West coast National Estuary Programs (Puget Sound Partnership, Tillamook Estuaries Partnership, Lower Columbia Estuary Partnership, San Francisco Estuary Partnership, The Bay Foundation), Tribal Marine Stewards Network, and sovereign Tribal nations to collaborate on shared freshwater flows priority actions.

MILESTONE

Hold one meeting between West coast National Estuary Programs and Tribal representatives.

Action 16 (Freshwater Flows) Overview

The flow of fresh water from the watershed to the Estuary to the Pacific Ocean is a critical hydrologic process that influences almost all ecological processes and estuarine organisms in the Estuary. Altered freshwater flow regimes are one of the many powerful stressors affecting the health of the Estuary today, and studies show that current flows, particularly from the Sacramento and San Joaquin rivers and their tributaries, are insufficient to protect public trust resources, such as valuable aquatic ecosystems and multiple fish species.

Updates and Emerging Issues

Since 2016, this Action's focus remains largely similar to the last iteration of the Blueprint with the addition of expanding engaged stakeholders to include the priorities of Tribes and communities. Additionally, this task has identified natural and social science knowledge gaps to be filled and disseminated.

Climate Change Considerations

As climate change accelerates over the next decades, weather patterns are expected to become more extreme, leading to longer periods of drought, larger storms, and higher temperatures. Sierra snowpack may melt faster and earlier, leading to higher instream temperatures, with potentially devastating impacts on reservoir operations and salmonid mortality, as has occurred recently. Initiating research and providing management guidance through this Action will help address these vulnerabilities.

Equity Considerations

Tribes have long been excluded from restoration and management decisions that affect the flow of freshwater so vital to their peoples' histories, cultures, and livelihoods. Integrating Tribal priorities and Traditional Ecological Knowledge (TEK) into management decisions will build the foundation for future collaborative management practices and Tribal leadership in freshwater flows resources management.

Connections to Other Actions

As a critical hydrologic process, freshwater flows play important roles in the following Actions:

A5: Watershed Connections

A11: Transition Zones

A13: Sediment

A14: Creeks

A17: Water Conservation

A18: Recycled Water

ACTION 17 WATER CONSERVATION

Reduce water use around the Estuary.

Explore opportunities to reduce water exports from the Estuary through water demand management such as reduced water use for landscaping and residential water conservation.

TASK 17-1

Advance the installation of 'smart' water meters and monitors, including Advanced Metering Infrastructure or AMI, as industry best practice throughout the Estuary.

MILESTONE

Eight Bay Area Regional Reliability (BARR) water agencies to be substantially advanced in early phase conversion to 'smart' water meters, such as piloting testing or proof of concept.

TASK 17-2

Expand Bay Area Regional Energy Network (BayREN)'s Water Upgrades $ave Program to expedite customer participation and utility investment in indoor and outdoor water efficiency projects for single-family, multifamily, commercial, and institutional customers to reduce water waste from inefficient fixtures and leaks.

MILESTONE

Enrollment of 18 municipal water utilities in the Water Upgrades $ave Program

TASK 17-4

Develop a model ordinance for water efficient retrofit on resale or retrofit on listing, based on such examples as existing City of Davis, Santa Cruz County, and/or City and County of San Francisco ordinances, taking into account contingencies that do not delay close of escrow.

MILESTONE

Model retrofit ordinance for use by Estuary cities and counties.

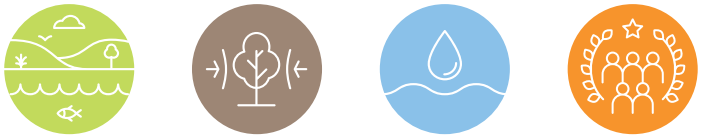
TASK 17-5

Convene Bay Area water and wastewater agencies to discuss regional water conservation targets, opportunities, and limitations, resulting in a synthesis report.

MILESTONE

Hold one workshop with stakeholders and produce report.

GOALS



TASK 17-3

Improve Model Water Efficient Landscape Ordinance (MWELO) compliance by providing MWELO and regenerative landscape trainings, and an MWELO Toolkit to municipal staff throughout the Estuary and other regions that obtain water from the Estuary or its watersheds.

MILESTONE

Offer 20 regenerative landscape and MWELO trainings.

TASK 17-6

Address knowledge gaps on the use of water by the Commercial, Industrial, and Institutional (CII) sector by completing a study similar to recent reports on the residential end indoor use of water for the region.

MILESTONE

Develop study and complete and disseminate report synthesizing a study on use of water by the CII sector.

Action 17 (Water Conservation) Overview

ATTACHMENT 1

Water conservation remains the most cost-effective and environmentally friendly way to reduce demand on overextended groundwater aquifers and riverine systems. Although California has passed legislation to require efficient water use both indoors and outdoors, opportunities still exist to improve implementation of these laws and address remaining gaps across the residential, agricultural, commercial, and industrial sectors.

Updates and Emerging Issues

This Action combines the two 2016 Actions on outdoor landscaping and agricultural water use efficiency and expands its focus to a suite of water conservation strategies targeting indoor residential use, outdoor water use across all sectors, and repairs. Additionally, this Action will anticipate emerging issues by laying out a task to convene water utility agencies and planners to consider the future of water conservation in the Bay Area.

Climate Change Considerations

This Action addresses water supply issues that will be exacerbated by climate change. Over the long term, other methods of extending water supply during long droughts, in addition to water use efficiency, may need to be developed or expanded. Additionally, exceptionally efficient use may create challenges for wastewater systems.

Equity Considerations

Multifamily residential units, especially rental units, pose one of the remaining challenges to increasing residential water use efficiency. Renters may pay into a shared water bill without seeing it, and therefore may unknowingly subsidize the cost of water wasted due to inefficient fixtures and leaks. Strategies to increase customer participation in water conservation programs can result in more affordable water bills for renters.

Connections to Other Actions

This Action connects to other Actions that focus on water supply, including:

A16: Freshwater Flows

A18: Recycled Water

A19: Stormwater

ATTACHMENT 1

ACTION 18 RECYCLED WATER

Expand the use of recycled water.

Work with water agencies, municipalities, and stakeholders to reduce barriers to the broader use of recycled water. Support the use of the right water at the right time and in the right place.

TASK 18-1

Encourage the sharing of recycled water informational materials, resources and program models among municipalities, wastewater agencies and drinking water agencies.

MILESTONE
Develop platform for sharing resources.

TASK 18-2

Collaborate with the Bay Area Clean Water Agencies' Recycled Water Committee stakeholders and others to identify opportunities to expand incorporation of recycled water in local and regional water resources planning processes.

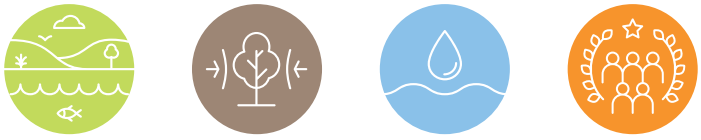
MILESTONE
Finalize Bay Area Clean Water Agencies Recycled Water Study.

TASK 18-4

Evaluate regional reverse osmosis concentrate (ROC) management options based on their ability to protect San Francisco Bay health and water quality while providing multiple stakeholder-driven benefits.

MILESTONE
Facilitate semi-annual discussions on the pathways to permitting ROC management within an inter-agency context.\

GOALS



TASK 18-3

Collaborate with the Bay Area Clean Water Agencies' Recycled Water Committee and others to convene stakeholders to identify opportunities for the broader use of recycled water, understand funding and planning gaps and address regulatory and permitting constraints.

MILESTONE

Hold forum to discuss overcoming challenges to regional recycled water projects.

Action 17 (Recycled Water) Overview

Recycled water refers to water that is treated to potable or non-potable standards for a beneficial use. In the Bay Area, local wastewater agencies work individually and through partnerships like the Bay Area Clean Water Agencies (Bay Area Clean Water Agencies) to implement strategic uses of recycled water, minimize its costs and maximize its benefits, and communicate a unified message about its complexities to the public. Without strong cross-jurisdictional governance and management structures, approaches to managing recycled water can be inconsistent and inefficient.

Updates and Emerging Issues

A deeper understanding of and connection between recycled water and estuarine health needs to be established in order to secure more public and elected buy-in. On first glance, recycled water may seem like a silver bullet to water scarcity issues; however, in reality the treatment and use of recycled water needs to carefully consider and manage the risks of treatment by-products such as reverse osmosis concentrate (ROC) and the resilience of wastewater treatment infrastructure to rising seas.

Climate Change Considerations

This Action addresses water supply issues that will be exacerbated by climate change. As climate change prolongs droughts and the public practices increased water efficiency, recycled water faces the unique challenge of unpredictable supply and competition that affects industries such as landscaping and refineries.

Equity Considerations

Much of the Bay Area's wastewater treatment infrastructure lies along shoreline, as well as in or near frontline communities. Regional resilience planning efforts will need to consider pollution risks for these communities as the shoreline infrastructure adapts to rising seas.

Connections to Other Actions

The management challenge posed by reverse osmosis concentrate management connects this Action to:

A20: Nutrients

A21: Emerging Contaminants

A22: Health Risks of Fish

This Action is also connected to other water supply Actions, such as:

A16: Freshwater Flows

A17: Water Conservation

A19: Stormwater

ACTION 19 STORMWATER

Manage stormwater with low impact development and green infrastructure.

Implement Low Impact Development (LID) and Green Stormwater Infrastructure (GSI) to reduce polluted stormwater to the Estuary. Develop planning & tracking tools, technical materials, policy recommendations, and financing strategy guidance to aid agencies with implementation.

TASK 19-1

Continue activities to expand funding opportunities for Green Stormwater Infrastructure (GSI) planning and implementation in the San Francisco Bay Area, including those identified in the ***Roadmap of Funding Solutions for Sustainable Streets***. Expand effort to engage utility agencies that also maintain infrastructure in the public realm to increase collaboration and cooperation.

MILESTONE

Convene stormwater management/transportation planning meetings twice a year with Metropolitan Transportation Commission, San Francisco Bay Regional Water Quality Control Board, and others.

TASK 19-2

Increase the capacity of the San Francisco Bay Low Impact Development (LID) Tracker Tool to track all implemented LID and Green Stormwater Infrastructure (GSI) projects reported to the San Francisco Bay Regional Water Quality Control Board and provide a cumulative effectiveness report of all LID/GSI projects on the water quality of SF Bay.

MILESTONE

Establish a permanent agency home for LID Tracker Tool with budget for coordination with municipalities and countywide clean water programs, project data compilation and entry, and ongoing software maintenance.

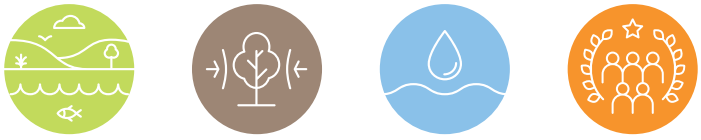
TASK 19-4

Develop a stormwater asset management module within the Metropolitan Transportation Commission's StreetSaver Program to help Bay Area municipal jurisdictions improve inventory, inspection, and maintenance of storm drain and green infrastructure assets.

MILESTONE

Develop revised StreetSaver Program that includes a stormwater asset management module.

GOALS



TASK 19-3

Pilot an alternative or In-Lieu LID Compliance program for San Francisco Bay Regional Water Quality Control Board regulated projects where on-site stormwater treatment is not feasible to assure municipalities that a programmatic approach to alternative compliance can provide funding for both implementation and long-term operations and maintenance of Green Stormwater Infrastructure in the public realm.

MILESTONE

Establish San Francisco Bay Regional Water Quality Control Board-approved alternative compliance pilot program with two public projects identified for receiving resources from regulated project proponents.

Action 19 (Stormwater) Overview

In cities around the region, impervious surfaces such as streets and sidewalks typically represent 15-25% of land cover. Impervious surfaces prevent stormwater from being filtered through the soil, and results in storm runoff that carry pollutants like oil, grease, pesticides, and heavy metals down drains and straight into the Estuary. As climate change brings more extreme weather events to the Estuary, green stormwater infrastructure (GSI) and low impact development (LID) installations can distribute runoff into inlets across a longer period of time, helping to reduce the impacts of urbanization on local hydrology and water quality.

Updates and Emerging Issues

Since 2016, this Action has shifted its focus from planning to implementation, with projects being tracked regionally via new software. Additionally, this Action now explores creative ways to fund stormwater infrastructure projects, such as an in-lieu alternative compliance pilot program that would allow cities to get GSI funding from private projects where on-site treatment is infeasible.

Climate Change Considerations

Climate change will bring more extreme weather events to the Estuary, causing periods of drought and periods of intense precipitation. GSI/LID installations can distribute runoff into inlets across a longer period, helping to reduce flooding due to overwhelmed storm systems.

Equity Considerations

GSI/LID techniques often improve community aesthetics and create more pedestrian friendly spaces, which are needed in many underserved communities. However, these projects can also raise property values and lead to green gentrification, further exacerbating displacement in communities already vulnerable to hot real estate markets.

Connections to Other Actions

The use of GSI/LID to prevent water pollution and flooding hazards closely connects this action with:

A1: Climate Resilience

A2: Equity

A3: Adaptation Planning

A4: Adaptation Projects

A18: Recycled Water

A20: Nutrients

A21: Emerging Contaminants

A22: Health Risks of Fish

ACTION 20 NUTRIENTS

Advance nutrient management in the Estuary.

Support water quality investigations, consistent monitoring and modeling, and analysis of management alternatives for nutrients, along with the dissemination of public-facing outreach materials on resulting data and management decisions.

TASK 20-1

Ensure the continuation of a long-term monitoring and modeling program of nutrient-related indicators in San Francisco Bay through the San Francisco Bay Regional Water Quality Control Board's Nutrient Management Strategy and program partnerships and in the Sacramento San-Joaquin Delta through the United States Geological Survey and Interagency Ecological Program.

MILESTONE

Renew funding for long-term monitoring and modeling. Establish funding level for a sustainable long-term program and investigate additional funding sources.

TASK 20-2

Implement and iterate the Science Plan and Nutrient Assessment Framework of the San Francisco Bay Nutrient Management Strategy to establish the status and trends of nutrient indicators and quantitatively inform San Francisco Bay's response to nutrient loading.

MILESTONE

Complete the current round of modeling and synthesis studies and develop a final version of the Assessment Framework by 2024 to inform future permits and other management actions.

TASK 20-4

Disseminate information to decision-makers and the public regarding the status and trends of nutrient-related indicators and research findings, as well as the opportunities, constraints, and costs associated with various nutrient load management strategies.

MILESTONE

Release outreach materials related to the status and trends of crucial nutrient indicators via a web-based portal updated on an annual basis and release public-facing syntheses of research findings on an annual basis.

TASK 20-5

Develop a framework for monitoring, modeling, and information dissemination on the extent, severity, and health impacts of Harmful Algal Blooms (HABs) in the Delta.

MILESTONE

Develop HABs framework.

GOALS

TASK 20-3

Undertake studies in the Estuary related to developing and evaluating alternatives for nutrient management actions, including initial considerations of costs and environmental effects.

MILESTONE

Complete an evaluation of opportunities to manage nutrient loading via nature-based solutions and recycled water.

Action 20 (Nutrients) Overview

Excess levels of nutrients, such as nitrogen and phosphorus, can cause problems like algae blooms and oxygen levels too low to support diverse native fish communities. Historically, the San Francisco Bay has not experienced the adverse effects of nutrient loading even though it is nutrient enriched compared to other estuaries. However, nutrients from the Delta affect Suisun and San Pablo Bays, and is one example that highlights the need for a holistic understanding of nutrient dynamics throughout the entire Estuary. Thus, robust long-term monitoring and continuing investigations must inform nutrient management.

Updates and Emerging Issues

Since 2016, the San Francisco Bay Nutrient Management Strategy has been established as a joint fact-finding initiative. Looking forward to 2027, permits will be revised to incentivize nutrient reduction strategies before nutrients reach wastewater treatment plants. Future priorities must include increasing the funding pool across a wider range of sources, ensuring diverse engagement from communities as nutrient reduction strategies emerge, and continuing to study nutrient dynamics across the entire estuary to identify the most appropriate set of management needs.

Climate Change Considerations

Scientists believe warming oceans are causing a cascade of changes with a nexus to nutrients. These changes include increased upwelling of nutrient-rich waters, phytoplankton production, ocean acidification, harmful algae blooms, and hypoxia. In shallower portions of the Bay, fish will become less resilient to low dissolved oxygen levels as temperatures increase. Looking to the 2027 update, a Task researching the potential for wastewater-borne nutrients to exacerbate climate change impacts will need to be added to this Action, especially since fish will become less resilient to low levels of dissolved oxygen as temperatures increase. Current Tasks focus on preliminary research on the effects of nutrient loading on the Estuary.

Equity Considerations

Successful nutrient management will enable ongoing access to surface waters that support subsistence fishing and cultural uses, promote multi-benefit water quality projects to increase access to green infrastructure and open space, and increase job opportunities in the wastewater sector. To ensure this vision, regional decision makers must engage diverse communities in more accessible and appropriate ways as shoreline resilience and nutrient management efforts emerge. Wastewater treatment upgrades and climate adaptation measures will affect historically low-income communities close to treatment facilities and managers have increasingly recognized the need to engage communities traditionally excluded from decision making processes.

Connections to Other Actions

Factors related to nutrient management in the estuary include the amount of freshwater flow available to flush the Delta, the quantity of sediment available to block sunlight and mitigate the proliferation of harmful algal blooms, whether sea level rise will affect how wastewater is treated and disposed of, and the rate at which the region can deploy nature-based solutions for multiple benefits, including water quality improvement. This action is therefore connected to:

A1: Climate Resilience
A2: Equity
A3: Adaptation Planning
A4: Adaptation Projects
A18: Recycled Water
A21: Emerging Contaminants
A22: Health Risks of Fish

ACTION 21 EMERGING CONTAMINANTS

Address emerging contaminants in the Estuary's waters.

Advance action plans for specific contaminants of emerging concern (CECs), and the associated Regional Monitoring Program (RMP) CECs monitoring strategy. Support and expand existing education and public outreach and other pollution prevention efforts to reduce CECs.

TASK 21-1

Review and update the San Francisco Bay Regional Monitoring Program CECs and microplastics monitoring strategies every two years. Develop management-relevant information to support selection and implementation of management measures addressing CECs and microplastics by the Department of Toxic Substances Control (DTSC) and the San Francisco Bay Regional Water Quality Control Board.

MILESTONE

Complete three reviews and updates. Provide management-relevant information to DTSC, Bay Area Clean Water Agencies' Bay Area Pollution Prevention Group , and the San Francisco Bay Regional Water Quality Control Board to support management actions.

TASK 21-2

Reduce pesticides coming into the Estuary, particularly from pet flea and tick control products by supporting and working with the Department of Pesticide Regulation and veterinarians.

MILESTONE

Implement at least one pesticide-reduction management measure.

TASK 21-4

Support the Department of Toxic Substances Control's (DTSC) Safer Consumer Products Program's efforts to reduce CECs like PFAS (Per- and polyfluoroalkyl substances: stain and water repelling chemicals widely used in industrial and consumer products) and ethoxylated surfactants found in cleaning products and detergents to protect people (e.g., fish consumers) and the Bay ecosystem by providing management-relevant information, and through local implementation of measures to promote safer alternatives (e.g., purchasing preferences).

MILESTONE

Provide management-relevant information to the Department of Toxic Substances Control to support two management actions.

GOALS

TASK 21-3

Support statewide efforts to address microplastic pollution.

MILESTONE

Provide management-relevant information to the Ocean Protection Council, the Department of Toxic Substances Control, and other agency partners to support management actions.

Action 21 (Emerging Contaminants) Overview

Over 100,000 chemicals have been registered or approved for commercial use in the United States; however, the lack of complete information about these chemicals limits the ability of scientists to assess their potential risk. Contaminants of Emerging Concern (CECs) have the potential to harm people and wildlife, and have not yet been adequately addressed through regulation. In the San Francisco Estuary, a tiered, risk-based approach is used to classify CECs as high, moderate, or low concerns, with an additional category of possible concern where risks are uncertain or unknown.

Updates and Emerging Issues

Since 2016, the Estuary's Regional Monitoring Program has classified microplastics and key plastic ingredients, two common ant, termite, and flea pesticides, and per and polyfluoroalkyl substances (PFAS) as contaminants of moderate concern for the Estuary. This Action continues to monitor and research CECs and their potential impacts on the Estuary. Looking to the future, pesticides related to pet products is an anticipated issue.

Climate Change Considerations

CECs can be mobilized from the soil due to sea level rise and leach into groundwater supplies. While the Regional Monitoring Program and the San Francisco Estuary Institute track CECs, the effects of climate change on high-risk locations have yet to be identified. Task 1-8 will be a first step in studying the potential influence of rising sea level on contaminated sites around Bay margins.

Equity Considerations

Frontline, disadvantaged, underserved, and Tribal communities carry the highest risk of exposure to CECs due to their proximity to contaminated lands and practices such as subsistence fishing.

Connections to Other Actions

CECs negatively and inequitably impact water quality and public health; thus, this Action is closely related to:

A2: Equity

A18: Recycled Water

A19: Stormwater

A20: Nutrients

A22: Health Risks of Fish

ACTION 22
HEALTH RISKS OF FISH

Reduce health risks due to contaminants in fish.

Addresses contaminants in fish and health risks related to fish consumption, cultural and traditional uses.

TASK 22-1

Collaborate with Tribes and subsistence fishing communities to acknowledge the importance of Tribal cultural and traditional uses of water as well as subsistence fishing, and designate Tribal Tradition and Culture, Tribal Subsistence Fishing, and Subsistence Fishing Beneficial Uses of water bodies in the San Francisco Bay Region.

MILESTONE

Amend the San Francisco Bay Regional Water Quality Control Board's Basin Plan to designate additional Beneficial Uses.

TASK 22-2

Partner with community-based organizations to collect information on subsistence fishing in the Estuary, focusing on disadvantaged and underserved communities, to develop an understanding of health risks and how stakeholder values, and cultural, recreational, natural resource, and agricultural uses vary geographically and across demographics.

MILESTONE

Secure funding for community-based organizations to collect data on subsistence fishing practices and consumption in at least two communities in the San Francisco Estuary.

TASK 22-4

Work with frontline, underserved, or disadvantaged communities to collect information on community-identified and -prioritized potential toxic water quality hot spots not listed on regulatory lists for cleanup.

MILESTONE

Develop a community-based toxic hot spot map under the guidance of at least three frontline, underserved, and/or disadvantaged communities around the Estuary.

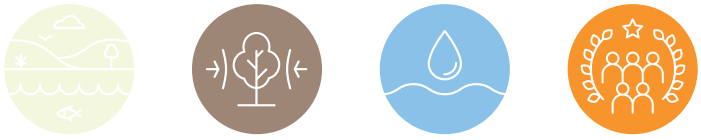
TASK 22-5

Use the results of community-based toxic hot spot mapping to update and prioritize toxic hot spots identified by the Bay Protection and Toxic Cleanup Program, including the status of sediment quality and other indicators of bioaccumulation associated with fish consumption warnings, to inform management needs.

MILESTONE

Update and prioritize known toxic hot spot lists, including community-identified hot spots, to inform management needs.

GOALS



TASK 22-3

Develop Advisory Tissue Levels for one or more chemicals found in San Francisco Estuary fish, such as PFAS chemicals.

MILESTONE

Complete development of Advisory Tissue Levels for one or more chemicals and, as appropriate, develop or update fish advisories for specific water bodies (e.g., the Delta or San Francisco Bay) within the San Francisco Bay Estuary system.

TASK 22-6

Conduct thorough fish monitoring in the locations where communities with high rates of consumption collect fish from the Bay. Analyze the species they consume and the pollutants that they are concerned about. Coordinate this monitoring with the consumption survey work of Task 22-2 in partnership with community-based organizations.

MILESTONE

Monitor fish contamination in priority locations identified by at least two communities in the San Francisco Estuary.

Action 22 (Health Risks of Fish) Overview

Organisms living in or near the Estuary can absorb contaminants in the water, such as mercury, polychlorinated biphenyls (PCBs), and Per-/Polyfluoroalkyl Substances (PFAS). In a food web, contaminants become more and more concentrated as predators consume prey and accumulate contaminants through their diet. The concentration of contaminants in fish can make them unsafe for human consumption in the Estuary, and can disproportionately impact Tribal, disadvantaged, and underserved communities that fish for cultural and subsistence purposes.

Updates and Emerging Issues

Since 2016, this Action has shifted its approach to addressing water quality from an habitat-centric approach (Total Maximum Daily Loads, or TMDLs) to a human-centric approach (exposure to hazardous levels of contaminants by subsistence fishers).

Climate Change Considerations

With sea level rise and, in some areas, associated groundwater rise, contaminants from current and former industrial sites along the Bay margins may be mobilized in groundwater or leach into the Estuary. Task 1-8 will be a first step in studying the potential influence of rising sea level on contaminated sites around Bay margins.

Equity Considerations

Some contaminants may be more concentrated in waters nearby former industrial sites, disproportionately affecting communities that fish for subsistence or cultural purposes, including communities of color and lower income, and Tribes.

Connections to Other Actions

The contamination of fish negatively and inequitably impacts public health, and is closely related to water quality; thus, this Action is connected to:

A2: Equity

A18: Recycled Water

A19: Stormwater

A20: Nutrients

A21: Emerging Contaminants

A24: Public Access

ACTION 23 TRASH

Reduce trash input into the Estuary.

Assist regional municipalities and agencies in attaining trash reduction objectives by assisting in source reduction activities, such as extended producer responsibility strategies that can reduce trash before it reaches the Estuary, and by highlighting trash reduction rates in the State of the Estuary Report when trash-tracking metrics are agreed upon by Bay Area stakeholders.

TASK 23-1

Continue to partner with municipalities, counties, pollution prevention organizations, and other stakeholders to research and implement effective extended producer responsibility (EPR) strategies or bans for items such as plastic products, microplastics, and tobacco products in the Estuary.

MILESTONE

Implement new bans or extended producer responsibility (EPR) strategies such as reduction ordinances based on recommendations (i.e., source control).

TASK 23-2

Develop an indicator based on regionally meaningful metrics of trash in the Estuary and its watershed for use in the State of the Estuary report.

MILESTONE

Include assessments of trash reduction in San Francisco Bay and its watersheds in the next report.

GOALS

Living Resources | Resilience | Water | Stewardship

Action 23 (Trash) Overview

ATTACHMENT 1

Every year, 1.36 million gallons of trash flows into San Francisco Bay and its creeks from storm drains. While trash is one of the easiest pollutants to see, it is one of the most difficult to measure, which creates a unique challenge for addressing this issue. This Action focuses on reducing the source of trash through coordinated monitoring and policy change.

Updates and Emerging Issues

While municipal governments have made significant progress towards reducing trash entering storm drains, significant work still needs to be done by municipalities to achieve regulatory milestones as trash continues to be a persistent and ongoing water quality issue. Conflicting perspectives on where to prioritize funding has stalled the implementation of coordinated monitoring, regulatory enforcement, and public engagement.

Climate Change Considerations

As climate change creates more extreme and unpredictable storms, the risk and volume of trash entering the Estuary via storm drains and waterways may increase dramatically. Tasks under this Action will improve monitoring and understanding of effective strategies to reduce this risk.

Equity Considerations

By focusing on producer responsibility as a means of source control, the environmental costs of trash will decrease in relation to the consumer. Illegal dumping and trash hot spots are more prevalent in disadvantaged and underserved communities where trash can clog storm drains and contribute to flooding.

Connections to Other Actions

The prevalence of trash in the Estuary is closely related to stormwater runoff and water quality. Thus, this Action is closely connected with:

A19: Stormwater

A21: Emerging Contaminants

A22: Health Risks of Fish

ACTION 24 PUBLIC ACCESS

Provide equitable public access and recreational opportunities compatible with wildlife.

Provide Estuary-oriented, upper watershed, and other open space public access and recreational opportunities that avoid adverse impacts to sensitive habitats and wildlife while accommodating equitable access and cultural uses, environmental education, biking, commuting, hiking, paddling, wildlife viewing, and other activities. These opportunities will increase citizen and decision-maker appreciation of the value of natural resources, and foster support for Estuary resource protection and restoration.

TASK 24-1

Add to the San Francisco Bay Trail, closing critical gaps in the main alignment (the "spine") that links the shoreline of all nine Bay Area counties, while avoiding adverse effects on sensitive resources and wildlife.

MILESTONE

Add 18 miles of new trail segments to the Bay Trail Spine.

TASK 24-2

Add to the San Francisco Bay Area Water Trail, creating or enhancing high quality public water access and paddle-in camping opportunities. Access should be designed to avoid adverse impacts to sensitive resources and wildlife.

MILESTONE

Complete six (with two specifically in the Suisun Marsh area) new or enhanced San Francisco Bay Area Water Trail sites, including two new or enhanced kayak-in campgrounds.

TASK 24-4

Track progress towards increasing quality and quantity of Bay-Delta shoreline and upper watershed open spaces for multiple public uses including recreational, cultural, religious, and stewardship.

MILESTONE

Advance indicators for the State of the Estuary Report to track both quantity and quality of shoreline open space and riparian areas.

GOALS

Living Resources | Resilience | Water | Stewardship

TASK 24-3

Advance the consideration of equity and resilience within parks and open space planning efforts through development of two new Bay Area Greenprint modules using Geographic Information System (GIS)-based analytics and tools.

MILESTONE

Release Resilience and Equity Modules for Bay Area GreenPrint

Action 24 (Public Access) Overview

The Estuary provides unique opportunities for recreational and educational experiences due to its vital role in providing refuge, forage, and nesting habitat for wildlife. Public access to the Estuary's natural resources inspires people to take an active interest in Estuary protection and restoration efforts; however, public access can also have adverse effects on wildlife and habitats if it is not sited, designed, and managed responsibly.

Updates and Emerging Issues

Since 2016, this Action has updated its Milestones for the San Francisco Bay Trail and the San Francisco Bay Area Water Trail.

Climate Change Considerations

This Action supports efforts to avoid adverse impacts to habitat and wildlife while supporting public access to open space. Looking forward to the future, rising sea levels may decrease acreage of open space for both wildlife and public access, and this Action will need to balance public access against adverse impacts to wildlife habitat.

Equity Considerations

This Action recognizes that public access to open space is not equitable for all populations and seeks to consider equity modules in local open space planning efforts. Additionally, this Action now considers the use of open space for cultural and religious purposes and acknowledges its positive effect on public health.

Connections to Other Actions

Public access to open space plays an important role in cultivating diverse and active stewardship to the Estuary. Consequently, this Action is closely connected to:

A1: Climate Resilience

A2: Equity

A3: Adaptation Planning

A4: Adaptation Projects

A5: Watershed Connections

A8: WRMP

A10: Tidal Marsh

A12: Managed Wetlands

A4: Creeks

A25: Champion

ACTION 25 CHAMPION

Champion the Estuary.

Educate partners, stakeholders, national, local, and regional leaders, and other targeted audiences about the priorities in the Estuary Blueprint. Provide local decision-makers, the public, and youth with the kind of reliable information necessary to make policy and personal decisions in favor of Estuary health.

TASK 25-1

Update and advance implementation of the Estuary Partnership's Strategic Communications Plan, leveraging existing platforms and partnerships to increase awareness of and engagement in the goals of the Estuary Blueprint.

MILESTONE
Update and fund the Strategic Communications Plan.

TASK 25-2

Provide the latest information on the science and management of the Estuary and advance integrated conferences that span the Estuary.

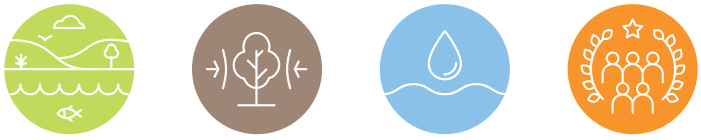
MILESTONE
Hold annual conferences that focus on the San Francisco Estuary.

TASK 25-4

Support and expand Estuary-oriented outreach and education programs provided by local and community-based organizations, either through direct funding, support with developing materials, or other tools to be identified in collaboration with existing programs.

MILESTONE
Expand existing or new outreach and education programs to reach 500 new participants.

GOALS



TASK 25-3

Provide current information on the health of the Estuary and results of management approaches by periodically updating the State of the Estuary Report.

MILESTONE

Update the State of the Estuary Report.

Action 25 (Champion) Overview

The future of the Estuary depends on support from diverse, engaged audiences. Support can be cultivated through place-based environmental education and outreach in Estuary watersheds. The San Francisco Estuary Partnership is actively developing, expanding, and funding public engagement initiatives to increase support for the restoration and protection of the San Francisco Estuary.

Updates and Emerging Issues

Since 2016, this Action has shifted away from a focus on the Estuary Blueprint itself and toward support for the Estuary as a whole. The Action has been updated to include tasks on K-12 outreach and education, with particular emphasis on climate change.

Climate Change Considerations

Communicating the urgency of the climate crisis to current and future audiences can garner support for a healthy, resilient Estuary and can foster greater participation in Estuary Blueprint priorities.

Equity Considerations

Estuary-oriented outreach and education programs are most effectively conducted by local and community-based organizations, which have established trust and relationships in the communities that they serve. While providing resources towards these organizations, it is critical that the San Francisco Estuary Partnership consider dimensions of equity to appropriately prioritize and allocate resources.

Connections to Other Actions

Championing the Estuary connects this Action to all Actions in the Estuary Blueprint. However, this Action is most directly related to:

A2: Equity

A24: Public Access

Draft Estuary Blueprint Task Leads and Collaborating Partners – January 2022

Action	Task	Lead Implementer	Collaborating Partners
1: Climate Resilience	1-1	San Francisco Bay Conservation & Development Commission, local jurisdictions, community-based organizations	San Francisco Bay Regional Water Quality Control Board, Association of Bay Area Governments/Metropolitan Transportation Commission, San Francisco Estuary Partnership, California State Coastal Conservancy, Bay Area Regional Collaborative, California Department of Transportation, Bay Area Climate Adaptation Network, San Francisco Estuary Institute, San Francisco Bay Regional Coastal Hazards Adaptation Resiliency Group (CHARG), Delta Stewardship Council, Delta Conservancy, environmental justice advocacy organizations, environmental organizations, academia, education/cultural organizations
	1-2	Delta Stewardship Council	Local jurisdictions, community-based organizations, environmental organizations, San Francisco Estuary Partnership, San Francisco Estuary Institute, Delta Conservancy, US Army Corps of Engineers
	1-3	NorCal Resilience Network, West Oakland Environmental Indicators Project, Bay Area Climate Adaptation Network, San Francisco Regional Water Quality Control Board	San Francisco Bay Conservation & Development Commission, Metropolitan Transportation Commission/Association of Bay Area Governments, San Francisco Estuary Partnership, California State Coastal Conservancy, Bay Area Regional Collaborative, National Oceanic and Atmospheric Administration, Delta Stewardship Council, community-based organizations, local jurisdictions
	1-4	San Francisco Estuary Partnership (Coordinator)	San Francisco Planning and Urban Research Association (SPUR), Save the Bay, Bay Area Council, Sierra Club California, regulatory agencies
	1-5	San Francisco Estuary Institute, Bay Area Climate Adaptation Network, San Francisco Bay Conservation & Development Commission, Association of Bay Area Governments/Metropolitan Transportation Commission	San Francisco Bay Regional Water Quality Control Board, San Francisco Bay National Estuarine Research Reserve, Delta Stewardship Council, San Francisco Estuary Partnership, California State Coastal Conservancy, Bay Area Regional Collaborative, Bay Area Climate Adaptation Network, National Oceanic and Atmospheric Administration, San Francisco Bay Regional Coastal Hazards Adaptation Resiliency Group (CHARG)
	1-6	San Francisco Estuary Institute, San Francisco Bay Regional Water Quality Control Board	Local jurisdictions
	1-7	Association of Bay Area Governments/Metropolitan Transportation Commission, San	Delta Stewardship Council, San Francisco Bay Conservation & Development Commission, California State Coastal Conservancy, Bay Area Regional

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Action	Task	Lead Implementer	Collaborating Partners
		Francisco Estuary Partnership, local jurisdictions	Collaborative, Bay Area Climate Adaptation Network, San Francisco Estuary Institute, Strategic Growth Council
	1-8	San Francisco Estuary Institute, University of California-Berkeley, Pathways Climate Institute	San Francisco Bay Regional Water Quality Control Board, City and County of San Francisco, cities of Richmond and Berkeley; Contra Costa, Alameda, Marin, San Mateo counties; San Francisco Bay Conservation & Development Commission
2: Equity	2-1	San Francisco Bay Conservation & Development Commission in coordination with Bay Area-based organizations, San Francisco Bay Conservation & Development Commission's Environmental Justice (EJ) Advisors, and regional partners	Bay Area Climate Adaptation Network, community-based organizations, interested Bay Area counties, Bay Area Regional Health Inequities Initiative
	2-2	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Restoration Authority, Coastal Conservancy
	2-3	San Francisco Bay Conservation & Development Commission, Delta Stewardship Council	California Department of Fish & Wildlife, California Department of Water Resources, University of California-Davis
	2-4	Tribes, California Indian Environmental Alliance (CIEA), San Francisco Estuary Partnership (Coordinator)	Tribes, California Indian Environmental Alliance (CIEA), San Francisco Bay Conservation & Development Commission, Centers for Disease Control and Prevention, California State Coastal Conservancy, Association of Bay Area Governments/Metropolitan Transportation Commission
	2-5	San Francisco Estuary Partnership	Universities or scientific research organizations
3: Adaptation Planning	3-1	Bay Area Climate Adaptation Network, West Oakland Environmental Indicators Project, Bay Area Regional Collaborative	Community-based organizations, San Francisco Bay Conservation & Development Commission, Metropolitan Transportation Commission/Association of Bay Area Governments, San Francisco Estuary Partnership, National Oceanic and Atmospheric Administration, California State Coastal Conservancy, California Department of Water Resources, San Francisco Bay Restoration Authority, local jurisdictions
	3-2	Metropolitan Transportation Commission/Association of Bay Area	San Francisco Bay Water Quality Control Board, San Francisco Estuary Partnership, California State Coastal Conservancy, Bay Area Regional Collaborative, Bay Area

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Action	Task	Lead Implementer	Collaborating Partners
		Governments, San Francisco Bay Conservation & Development Commission	Climate Adaptation Network, National Oceanic and Atmospheric Administration, San Francisco Estuary Institute, Delta Stewardship Council
	3-3	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, San Francisco Bay Conservation & Development Commission, Delta Stewardship Council, California Department of Fish & Wildlife, US Fish & Wildlife Service, US Army Corps of Engineers
	3-4	San Francisco Bay Restoration Regulatory Integration Team (BRRIT) Policy Management Committee	Project implementers
	3-5	Association of Bay Area Governments/Metropolitan Transportation Commission	Local Jurisdictions, San Francisco Estuary Partnership, California State Coastal Conservancy, San Francisco Bay Conservation & Development Commission
	3-6	Association of Bay Area Governments/Metropolitan Transportation Commission, San Francisco Bay Conservation & Development Commission	San Francisco Estuary Partnership, San Francisco Bay Restoration Authority, California State Coastal Conservancy
	3-7	Association of Bay Area Governments/Metropolitan Transportation Commission	Local jurisdictions
4: Adaptation Implementation	4-1	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Conservation & Development Commission, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, Delta Stewardship Council, California Department of Fish & Wildlife, US Fish & Wildlife Service, US Army Corps of Engineers, San Francisco Bay Restoration Authority, State Coastal Conservancy, San Francisco Bay Joint Venture
	4-2	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Conservation & Development Commission, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, Delta Stewardship Council, California Department of Fish & Wildlife, US Fish &

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Action	Task	Lead Implementer	Collaborating Partners
			Wildlife Service, US Army Corps of Engineers, San Francisco Bay Restoration Authority, California State Coastal Conservancy, San Francisco Bay Joint Venture
	4-3	California State Coastal Conservancy	California Department of Fish & Wildlife, National Oceanic and Atmospheric Administration, San Francisco State University/Estuary & Ocean Science Center, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, Smithsonian Environmental Research Center, San Francisco Estuary Institute, US Fish & Wildlife Service
	4-4	San Francisco Bay Conservation & Development Commission, San Francisco Estuary Institute	Association of Bay Area Governments/Metropolitan Transportation Commission, California State Coastal Conservancy, San Francisco Bay Regional Water Quality Control Board
	4-5	San Francisco Estuary Partnership	San Francisco Estuary Institute, San Francisco Bay Joint Venture, San Francisco Bay Conservation & Development Commission, Delta Stewardship Council, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, local jurisdictions
5: Watershed Connections	5-1	San Francisco Estuary Institute, local watershed management agencies	US Army Corps of Engineers, US Environmental Protection Agency, National Oceanic and Atmospheric Administration Fisheries, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Conservation & Development Commission, California Department of Fish & Wildlife, California Department of Water Resources
	5-2	San Francisco Estuary Institute	San Francisco Estuary Partnership, San Francisco Bay Conservation & Development Commission, San Francisco Bay Regional Water Quality Control Board, National Oceanic and Atmospheric Administration Fisheries
	5-3	San Francisco Estuary Institute, San Francisco Estuary Partnership	San Francisco Bay Regional Water Quality Control Board
	5-4	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, State Water Resources Control Board Division of Water Rights, National Oceanic and Atmospheric Administration Fisheries
	5-5	Marin Department of Public Works Engineering Sea Level Rise Program (E-SLR)	San Francisco Estuary Institute, San Francisco Estuary Partnership, San Francisco Bay Conservation & Development Commission, California State Coastal Conservancy, San

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Action	Task	Lead Implementer	Collaborating Partners
			Francisco Bay Regional Water Quality Control Board, National Oceanic and Atmospheric Administration Fisheries, Valley Water
6: Sediment	6-1	US Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board	US Fish & Wildlife Service, California Department of Fish & Wildlife, US Environmental Protection Agency, San Francisco Bay Conservation & Development Commission, National Oceanic and Atmospheric Administration Fisheries
	6-2	US Army Corps of Engineers, California State Coastal Conservancy, San Francisco Bay Conservation & Development Commission (unconfirmed)	San Francisco Bay Regional Water Quality Control Board, National Oceanic and Atmospheric Administration Fisheries, US Fish & Wildlife Service, California Department of Fish & Wildlife, US Environmental Protection Agency
	6-3	San Francisco Bay Regional Water Quality Control Board, California State Coastal Conservancy	San Francisco Estuary Institute, US Environmental Protection Agency, Centers for Disease Control and Prevention, US Fish & Wildlife Service, San Francisco Bay Conservation & Development Commission
	6-4	San Francisco Estuary Institute, San Francisco Bay Joint Venture	San Francisco Bay Conservation & Development Commission, San Francisco Bay Regional Water Quality Control Board, US Environmental Protection Agency
	6-5	California State Coastal Conservancy, SF Estuary Partnership (Coordinator)	US Army Corps of Engineers
	6-6	San Francisco Estuary Institute	San Francisco Bay Conservation & Development Commission, San Francisco Bay Regional Water Quality Control Board, US Army Corps of Engineers, US Geological Survey
	6-7	Delta Stewardship Council	San Francisco Estuary Institute
7: Carbon Management	7-1	California Department of Water Resources, Delta Conservancy	Ducks Unlimited, Delta Stewardship Council
	7-2	Delta Stewardship Council, US Geological Survey, California Department of Water Resources	Cal-State East Bay, University of California-Berkeley, San Francisco Bay National Estuarine Research Reserve

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Action	Task	Lead Implementer	Collaborating Partners
	7-3	Delta Stewardship Council, Delta Conservancy	
	7-4	California State Coastal Conservancy	
	7-5	San Francisco Bay National Estuarine Research Reserve	US Geological Survey, Delta Stewardship Council, UC Berkeley, academic institutions
	7-6	California Department of Water Resources, Delta Conservancy (unconfirmed)	American Carbon Registry, California Air Resources Board
8: Wetland Monitoring	8-1	San Francisco Estuary Partnership, San Francisco Estuary Institute	WRMP Technical Advisory Committee, WRMP Steering Committee (San Francisco Bay National Estuarine Research Reserve, US Geological Survey, SF Bay Regional Water Quality Control Board, San Francisco Bay Conservation & Development Commission, Environmental Protection Agency, National Marine Fisheries Service, US Fish & Wildlife Service, others)
	8-2	San Francisco Estuary Institute	WRMP Technical Advisory Committee and WRMP Steering Committee
	8-3	San Francisco Estuary Partnership, San Francisco Estuary Institute	San Francisco Bay Regional Water Quality Control Board, US Environmental Protection Agency, US Geological Survey, San Francisco Bay National Estuarine Research Reserve, and others
	8-4	San Francisco Estuary Partnership, San Francisco Estuary Institute	WRMP Steering Committee (Save the Bay, others) and WRMP Technical Advisory Committee
	8-5	Delta Stewardship Council, San Francisco Estuary Partnership, San Francisco Estuary Institute, San Francisco Bay National Estuarine Research Reserve, WRMP Technical Advisory Committee Chair & Vice Chair	WRMP Technical Advisory Committee and WRMP Steering Committee
9: Intertidal/Su	9-1	Audubon California, San Francisco State University/Estuary & Ocean Science Center	California Department of Fish & Wildlife, National Oceanic and Atmospheric Administration, Ocean Protection Council, San Francisco Bay Joint Venture, Merkel & Associates

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Action	Task	Lead Implementer	Collaborating Partners
btidal Habitats	9-2	National Oceanic and Atmospheric Administration, California State Coastal Conservancy, San Francisco State University/Estuary & Ocean Science Center	California Department of Fish & Wildlife, San Francisco Bay Joint Venture, Smithsonian Environmental Research Center
	9-3	National Oceanic and Atmospheric Administration, California State Coastal Conservancy, San Francisco Bay Restoration Authority	San Francisco State University/Estuary & Ocean Science Center, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, Smithsonian Environmental Research Center
	9-4	California State Coastal Conservancy, San Francisco Bay Restoration Regulatory Integration Team (BRRIT)	San Francisco State University/Estuary & Ocean Science Center
	9-5	California State Coastal Conservancy	California Department of Fish & Wildlife, National Oceanic and Atmospheric Administration Fisheries, San Francisco State University/Estuary & Ocean Science Center, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, Smithsonian Environmental Research Center, US Fish & Wildlife Service
	9-6	California State Coastal Conservancy	San Francisco Bay Conservation & Development Commission, California Department of Fish & Wildlife, National Oceanic and Atmospheric Administration Fisheries, San Francisco State University/Estuary & Ocean Science Center, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, Smithsonian Environmental Research Center, US Fish & Wildlife Service
	9-7	California Department of Fish & Wildlife, San Francisco Bay Joint Venture	California State Coastal Conservancy, San Francisco State University/Estuary & Ocean Science Center, San Francisco Estuary Institute
10: Tidal Marsh	10-1	California State Coastal Conservancy, San Francisco Bay Joint Venture, California EcoRestore	Restoration community and other interested public, private, and non-profit entities
	10-2	California State Coastal Conservancy, San Francisco Bay Joint Venture	Restoration community and other interested public, private, and non-profit entities

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Action	Task	Lead Implementer	Collaborating Partners
	10-3	California State Coastal Conservancy, San Francisco Bay Joint Venture	California Department of Water Resources, California EcoRestore, Restoration community and other interested public, private, and non-profit entities
11: Transition Zones	11-1	San Francisco Bay Joint Venture, San Francisco Estuary Partnership	Restoration community and other interested public, private, and non-profit entities
	11-2	San Francisco Bay Joint Venture, San Francisco Estuary Partnership	Restoration community and other interested public, private, and non-profit entities
	11-3	San Francisco Estuary Institute	WRMP Technical Advisory Committee and Geospatial Workgroup
	11-4	Central California Vegetation Managers' Workgroup	Central California Vegetation Managers' Workgroup (Novato Baylands Stewards, Point Blue's STRAW Program, others)
12: Managed Wetlands	12-1	California Department of Fish & Wildlife, State Coastal Conservancy, US Fish & Wildlife Service	California Waterfowl, Ducks Unlimited, California Department of Water Resources, Delta Conservancy, National Oceanic and Atmospheric Administration Fisheries, Point Blue Conservation Science, San Francisco Bay Bird Observatory, Suisun Resource Conservation District, University of California-Davis, US Geological Survey, Yolo Basin Foundation
	12-2	California Department of Fish & Wildlife, California State Coastal Conservancy, US Fish & Wildlife Service	California Waterfowl, Ducks Unlimited, Point Blue Conservation Science, San Francisco Bay Bird Observatory, Suisun Resource Conservation District, University of California-Davis, US Geological Survey, Yolo Basin Foundation
	12-3	California State Coastal Conservancy	California Department of Fish & Wildlife, California Waterfowl, Ducks Unlimited, California Department of Water Resources, Delta Conservancy, Point Blue Conservation Science, San Francisco Bay Bird Observatory, Suisun Resource Conservation District, University of California-Davis, US Fish & Wildlife Service, US Geological Survey, Yolo Basin Foundation
	12-4	California State Coastal Conservancy	California Department of Fish & Wildlife, California Waterfowl, Ducks Unlimited, Point Blue Conservation Science, San Francisco Bay Bird Observatory, Suisun Resource Conservation District, University of California - Davis, US Fish & Wildlife Service, US Geological Survey, Yolo Basin Foundation
	12-5	California State Coastal Conservancy	California Department of Fish & Wildlife, California Waterfowl, Ducks Unlimited, California Department of Water Resources, Delta Conservancy, Point Blue Conservation Science, San Francisco Bay Bird Observatory, Suisun Resource Conservation District,

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Action	Task	Lead Implementer	Collaborating Partners
			University of California-Davis, US Fish & Wildlife Service, US Geological Survey, Yolo Basin Foundation
13: Seasonal Wetlands	13-1	San Francisco Bay Joint Venture	Resource Conservation Districts, Natural Resources Conservation Service
	13-2	San Francisco Bay Joint Venture, Delta Stewardship Council	Resource Conservation Districts, Natural Resources Conservation Service
	13-3	Natural Resources Conservation Service, Resource Conservation Districts	San Francisco Estuary Partnership, San Francisco Bay Joint Venture
14: Creeks	14-1	San Francisco Bay Joint Venture, San Francisco Estuary Partnership (Coordinator)	San Francisco Estuary Institute, Delta Stewardship Council Delta Restoration Subcommittee, Valley Water, Conservation Lands Network, San Francisco Bay Regional Water Quality Control Board, National Oceanic and Atmospheric Administration Fisheries, California Department of Fish & Wildlife
	14-2	San Francisco Estuary Partnership, San Francisco Bay Regional Water Quality Control Board	Conservation Lands Network, Bay Area Flood Protection Agency Association, National Oceanic and Atmospheric Administration Fisheries, California Department of Fish & Wildlife, Resource Conservation Districts, Bay Area Watershed Network, ReScape California
	14-3	San Francisco Estuary Partnership, Delta Stewardship Council Delta Restoration Subcommittee	Resource Conservation Districts, land trusts, flood control districts, California Department of Fish & Wildlife, National Oceanic and Atmospheric Administration fisheries, US Army Corps of Engineers, Delta Plan Interagency Implementation Committee, Conservation Lands Network
	14-4	San Francisco Bay Joint Venture, San Francisco Estuary Partnership (Coordinator)	Bay Area Watershed Network, California Department of Fish & Wildlife, State Water Resources Control Board, National Oceanic and Atmospheric Administration Fisheries, Resource Conservation Districts, flood control districts, US Environmental Protection Agency, US Army Corps of Engineers, local municipalities, land trusts, non-governmental organizations, Conservation Lands Network
	14-5	San Francisco Estuary Partnership (Coordinator)	Homeless advocacy organizations, City/County health services departments, local non-governmental organizations
15: Invasive Species	15-1	California Invasive Plant Council, California Department of Food &	California State Parks Division of Boating and Waterways, Delta Conservancy, Delta Stewardship Council, National Oceanic and Atmospheric Administration Fisheries,

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Action	Task	Lead Implementer	Collaborating Partners
		Agriculture, California Department of Fish & Wildlife, California State Lands Commission, San Francisco Estuary Partnership, US Fish & Wildlife Service	PlantRight Partnership, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, California State Coastal Conservancy's Invasive Spartina Project, San Francisco Bay National Estuarine Research Reserve, Suisun Resource Conservation District, US Army Corps of Engineers, US Coast Guard, US Department of Agriculture, US Environmental Protection Agency
	15-2	California Invasive Plant Council, California Department of Fish & Wildlife, California State Coastal Conservancy, US Fish & Wildlife Service	California State Lands Commission, California State Parks Division of Boating and Waterways, Delta Conservancy, Delta Stewardship Council, National Fish and Wildlife Foundation, National Oceanic and Atmospheric Administration Fisheries, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, San Francisco Bay National Estuarine Research Reserve, US Army Corps of Engineers, US Department of Agriculture, US Environmental Protection Agency
	15-3	Delta Conservancy, Delta Stewardship Council, US Fish & Wildlife Service, San Francisco Estuary Partnership	California Department of Fish & Wildlife, California State Lands Commission, California Invasive Plant Council, California State Parks Division of Boating and Waterways, National Oceanic and Atmospheric Administration Fisheries, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, US Army Corps of Engineers, US Coast Guard, US Department of Agriculture, US Environmental Protection Agency
	15-4	California Department of Fish & Wildlife (Office of Spill Prevention and Response)	California Department of Fish & Wildlife, California State Lands Commission, California State Coastal Conservancy's Invasive Spartina Project, California Invasive Plant Council, California State Parks Division of Boating and Waterways, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, Delta Stewardship Council, Delta Conservancy, Moss Landing Marine Lab, National Oceanic and Atmospheric Administration Fisheries, Smithsonian Environmental Research Center, San Francisco Bay National Estuarine Research Reserve, San Francisco Estuary Partnership, US Army Corps of Engineers, US Coast Guard, US Department of Agriculture, US Environmental Protection Agency, US Fish & Wildlife Service
	15-5	California State Coastal Conservancy, California Invasive Plant Council	California Department of Fish & Wildlife, California State Parks Division of Boating and Waterways, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, Delta Stewardship Council, Delta Conservancy, National Oceanic and Atmospheric Administration Fisheries, State Coastal

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Action	Task	Lead Implementer	Collaborating Partners
			Conservancy's Invasive Spartina Project, San Francisco Bay National Estuarine Research Reserve, US Army Corps of Engineers, US Department of Agriculture, US Fish & Wildlife Service
	15-6	California State Coastal Conservancy	San Francisco Bay Conservation & Development Commission, Bay Restoration Regulatory Integration Team (BRRIT), California Department of Fish & Wildlife, California State Lands Commission, California Invasive Plant Council, Delta Stewardship Council, Delta Conservancy, National Oceanic and Atmospheric Administration Fisheries, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, US Army Corps of Engineers, US Department of Agriculture, US Environmental Protection Agency, US Fish & Wildlife Service
	15-7	National Oceanic and Atmospheric Administration Fisheries, US Army Corps of Engineers	San Francisco Bay Conservation & Development Commission, California Department of Fish & Wildlife, California State Lands Commission, California Invasive Plant Council, California State Parks Division of Boating and Waterways, Delta Stewardship Council, Delta Conservancy, San Francisco Bay Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board, San Francisco Bay National Estuarine Research Reserve, San Francisco Estuary Partnership, US Coast Guard, US Department of Agriculture, US Environmental Protection Agency, US Fish & Wildlife Service
16: Freshwater Flows	16-1	State Water Resources Control Board	San Francisco Estuary Partnership, National Oceanic and Atmospheric Administration Fisheries, Tribes, California Indian Environmental Alliance
	16-2	The Bay Institute	Virginia Institute of Marine Science, National Oceanic and Atmospheric Administration Fisheries
	16-3	Tribes, California Indian Environmental Alliance	California Department of Water Resources, State Tribal Liaisons, San Francisco Estuary Partnership
	16-4	Delta Protection Commission (unconfirmed), San Francisco Estuary Partnership (Coordinator)	Local universities or colleges, Tribes, California Indian Environmental Alliance (CIEA), fishing organizations, recreation organizations, tourist organizations
	16-5	San Francisco Estuary Partnership (Coordinator), San Francisco Baykeeper	National Oceanic and Atmospheric Administration Fisheries, Tribes, California Indian Environmental Alliance

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Action	Task	Lead Implementer	Collaborating Partners
	16-6	San Francisco Estuary Partnership	Puget Sound Partnership, Tillamook Estuaries Partnership, The Bay Foundation, Lower Columbia Estuary Partnership, Tribes, Tribal Marine Stewards Network
17: Water Conservation	17-1	Bay Area Regional Reliability (BARR) water agencies	
	17-2	Association of Bay Area Governments/Metropolitan Transportation Commission	ReScape California, water utilities
	17-3	ReScape California	Local jurisdictions
	17-4	San Francisco Estuary Partnership (Coordinator)	Sustainable Silicon Valley, Valley Water, Association of Bay Area Governments/Metropolitan Transportation Commission, Local jurisdictions
	17-5	Bay Area One Water Network	Climate Plan, San Francisco Estuary Partnership, Bay Area water and wastewater agencies
18: Recycled Water	18-1	San Francisco Estuary Partnership	Association of Bay Area Governments, Bay Area Clean Water Agencies, WateReuse California, various municipalities and water and wastewater agencies
	18-2	Bay Area Clean Water Agencies	Various municipalities and water and wastewater agencies
	18-3	Bay Area Clean Water Agencies	Bay Area One Water Network, San Francisco Estuary Partnership, San Francisco Bay Regional Water Quality Control Board, various municipalities and water and wastewater agencies
	18-4	Valley Water	San Francisco Estuary Partnership, Bay Area One Water Network, San Francisco Bay Regional Water Quality Control Board
19: Stormwater Management	19-1	San Francisco Estuary Partnership, Bay Area Municipal Stormwater Collaborative	Metropolitan Transportation Commission, California Department of Transportation, San Franciso Bay Regional Water Quality Control Board, Save the Bay, State Water Resources Control Board, Bay Area Flood Protection Agencies Association, ReScape California
	19-2	San Francisco Estuary Partnership, San Francisco Estuary Institute	Metropolitan Transportation Commission, San Francisco Bay Regional Water Quality Control Board, Bay Area Municipal Stormwater Collaborative, ReScape California

Draft Estuary Blueprint Task Leads and Collaborating Partners – January 2022

Action	Task	Lead Implementer	Collaborating Partners
	19-3	City of San Pablo, City of Walnut Creek, Contra Costa Countywide Clean Water Program	San Francisco Estuary Partnership, US Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board, Bay Area Municipal Stormwater Collaborative, San Mateo Countywide Water Pollution Prevention Program
	19-4	Metropolitan Transportation Commission	San Francisco Estuary Partnership, Bay Area Municipal Stormwater Collaborative, San Francisco Bay Regional Water Quality Control Board, Bay Area county and municipal agencies
20: Nutrients	20-1	San Francisco Bay Regional Water Quality Control Board, San Francisco Estuary Institute, Bay Area Clean Water Agencies	US Geological Survey, Interagency Ecological Program, Central Valley Regional Water Quality Control Board
	20-2	San Francisco Bay Regional Water Quality Control Board, San Francisco Estuary Institute, Bay Area Clean Water Agencies	University of California Berkeley, University of California Santa Cruz, Stanford University, Southern California Coastal Water Research Project, and other research partners
	20-3	San Francisco Bay Regional Water Quality Control Board, San Francisco Estuary Institute, Bay Area Clean Water Agencies	San Francisco Estuary Partnership, Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt), Valley Water
	20-4	San Francisco Bay Regional Water Quality Control Board, San Francisco Estuary Institute, Bay Area Clean Water Agencies	
	20-5	State Water Resources Control Board, US Geological Survey, Central Valley Regional Water Quality Control Board	Restore the Delta (unconfirmed), San Francisco Baykeeper (unconfirmed)
21: Emerging Contaminants	21-1	San Francisco Estuary Institute, San Francisco Bay Regional Water Quality Control Board	Bay Area Clean Water Agencies' Bay Area Pollution Prevention Group
	21-2	Bay Area Clean Water Agencies' Bay Area Pollution Prevention Group,	Veterinarians

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Action	Task	Lead Implementer	Collaborating Partners
		California Department of Pesticide Regulations	
	21-3	San Francisco Estuary Institute	Ocean Protection Council, Department of Toxic Substances Control
	21-4	San Francisco Estuary Institute	Bay Area Clean Water Agencies including member agencies
22: Health Risks of Contaminants	22-1	San Francisco Bay Regional Water Quality Control Board	Tribes, California Indian Environmental Alliance (CIEA)
	22-2	San Francisco Estuary Partnership (Coordinator)	All Positives Possible, First Generation Environmental Health & Economic Development (EHED), GreenAction, other community-based organizations representing disadvantaged and underserved communities, National Oceanic and Atmospheric Administration Office of Damage Assessment, Tribes, California Indian Environmental Alliance
	22-3	San Francisco Estuary Institute	All Positives Possible, GreenAction, First Generation Environmental Health & Economic Development, and other community-based organizations
	22-4	California Office of Environmental Health Hazard Assessment (OEHHA)	US Environmental Protection Agency
	22-5	San Francisco Estuary Partnership (Coordinator)	San Francisco Bay Regional Water Quality Control Board, California Department of Toxic Substances Control, US EPA Region 9, All Positives Possible, First Generation Environmental Health & Economic Development (EHED), GreenAction, other community-based organizations representing disadvantaged and underserved communities
	22-6	San Francisco Estuary Institute, California Department of Toxic Substances Control (unconfirmed), US Environmental Protection Agency Region 9`	All Positives Possible, First Generation Environmental Health & Economic Development (EHED), GreenAction, other community-based organizations representing disadvantaged and underserved communities, San Francisco Estuary Partnership, Tribes, CIEA
23: Trash	23-1	San Francisco Estuary Partnership	Bay Area Clean Water Agencies' Bay Area Pollution Prevention Group, San Francisco Bay Regional Water Quality Control Board, US Environmental Protection Agency, California Product Stewardship Council, and various municipalities.

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Action	Task	Lead Implementer	Collaborating Partners
	23-2	San Francisco Estuary Partnership, San Francisco Estuary Institute	Municipalities, San Francisco Bay Regional Water Quality Control Board, California Coastal Commission, and US Environmental Protection Agency
24: Public Access	24-1	Association of Bay Area Governments/Metropolitan Transportation Commission	San Francisco Bay Conservation & Development Commission, California State Coastal Conservancy, Bay area cities, counties, special districts, and non-profit organizations
	24-2	Association of Bay Area Governments/Metropolitan Transportation Commission, California State Coastal Conservancy	San Francisco Bay Conservation & Development Commission, California State Parks Division of Boating and Waterways
	24-3	San Francisco Estuary Partnership (Coordinator)	Together Bay Area
	24-4	San Francisco Estuary Partnership, San Francisco Estuary Institute	Community-based organizations, Tribes, California Indian Environmental Alliance
25: Champion the Estuary	25-1	San Francisco Estuary Partnership	San Francisco Bay Joint Venture, Estuary NEWS Magazine, Association of Bay Area Governments/Metropolitan Transportation Commission
	25-2	San Francisco Estuary Partnership, Delta Stewardship Council	Conference planning partners and attendees
	25-3	San Francisco Estuary Partnership, Delta Stewardship Council, San Francisco Estuary Institute	Scientific agencies and organizations, academia
	25-4	San Francisco Estuary Partnership	Community-based organizations offering outreach and education programs