

RECOMMENDATIONS & ACTIONS GUIDANCE DOCUMENT

Improving the Current Regulatory &
Flood Protection System



San Francisco Bay
Conservation & Development
Commission



A PRODUCT OF FLOOD CONTROL 2.0

FLOOD CONTROL 2.0



Flood Control 2.0: Rebuilding Habitat and Shoreline Resilience through a New
Generation of Flood Control Channel Design and Management
Guidance Document

November 2016

Updated January 2017

Funding provided by:
San Francisco Bay Water Quality Improvement Fund through EPA Region 9
and the San Francisco Estuary Partnership

*Cover Design: San Francisco Estuary Institute
Cover Photos: Adrien Baudrimont*

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Introduction:

In the San Francisco Bay Area, there is a consensus forming among flood control professionals that there may be better ways to apply for, and receive, permits and other required authorizations necessary for conducting flood protection maintenance and system renovation projects. Further, there is also a growing understanding that traditional flood protection measures, particularly concrete lined and trapezoidal channels, should evolve to restore riparian and tidal habitat features and functions, in order to better connect Bay Area communities to their watersheds, and the benefits they provide.

Historically, approximately 350 waterways made up the San Francisco Bay watershed. Today, less than 10% remain in a somewhat natural form (SFEI, 2016). Nearly a third of the original waterways were lost to development and nearly half currently flow into diked baylands, filled historical marshes or developed land, and others were re-routed to different channels (SFEI, 2016). Thirty-three of these channels are actively managed for flood control and the watershed for these channels collectively account for approximately 70% of the Bay Area watershed. Our waterways have changed and the habitat and species diversity that they once supported has also been altered. A number of plant and animal species are on the cusp of extinction and rely on the remaining habitat in these watersheds.

The move to improve aging flood control infrastructure within the region creates an opportunity for new, multi-benefit projects that incorporate flood control and habitat values into their design, leading to projects that meet the needs of flood control managers and regulatory and resource agencies. The planning and permitting process takes a significant amount of time and there is an imperative to improve both flood control projects and the regulatory response to them. However, none of the potential benefits of upgrading and adapting flood control systems to climate change will be realized without additional resources expended, both in the development of a new regulatory paradigm and sustaining it over the long term.

This guidance document is intended to highlight improved design, planning, and regulatory practices within the region that may provide benefits to both flood control managers and regulatory agencies. Guidance and recommendations provided herein were developed after conducting interviews with individual flood control managers, the Bay Area Flood Protection Agencies Association (BAFPAA), and regulatory and resource agency staff. Additionally, an extensive examination of current flood protection programs, regulatory requirements and the permitting processes in the region also informed the recommendations. The background and basis for these recommendations can be found in the companion document: [Flood Protection Projects and their Regulatory Process: An Analysis](#), and four case studies of flood control projects. During this review process, certain issues were mentioned repeatedly and therefore were identified as practices that, if addressed, may lead to healthier watersheds, a less stressful and more timely permit process, better professional relationships, and enhanced understanding of the value of the work undertaken. These key topics include: the Knowledge Base, Proposed Project, Outreach and Coordination, Information Provided/Application Package, Improved Permit Outcomes, Regional Approach, and Political and Management Support.

For each topic, a brief description of the issue is provided based on the extensive review contained in the associated [Flood Protection Projects and their Regulatory Process: An Analysis](#). Each issue description is followed by recommendations that can be undertaken by agencies, project proponents, and/or collaboratively as a group. It is anticipated that this guidance document will generate conversation among parties wanting to improve the design, construction and permitting process of flood protection projects. It should be noted that some flood protection projects are already implementing subsets of these recommendations. In the descriptions and recommendations below, the term "permit" when demarked with quotations encompasses State Lands Commission leases, water quality certifications, waste discharge requirements, consistency determinations, and incidental take permits, as well as biological opinions.

I. Knowledge Base

People from diverse backgrounds, professional or otherwise, must often work together. Each individual brings with them different values and varying levels of experience and knowledge. It is easy to make assumptions that others fully understand a topic or have the same depth of knowledge or values that you do. These assumptions can often prevent people from taking the time to explain the details of particular purposes, issues, challenges, or processes. Through discussions with flood protection agency, regulatory and resource agency staff in the region, it is clear that each group lacks full understanding of the others' activities, practices, and policies.

There are three general issues where increasing the knowledge base of flood protection agency, regulatory and resource agency staff would improve the project development and permitting process/timeline. There are many different "permitting" agencies each with their own laws, policies and requirements and it can be difficult for a project proponent to understand all of the variations and components that may apply to a project. Further, the regulatory and resource agencies do not appear to have a complete understanding of the activities and actions flood protection managers are obligated to undertake; the requirements of flood protection projects to meet levee safety and the Federal Emergency Management Agency (FEMA) standards; and the consequences of not taking certain actions. Lastly, there is a lack of understanding of the process, sequencing and timing of permit issuance from the various agencies and flood protection managers, and the dependencies between the "permits."

a. Recommendation: Training (All)

To create a common understanding of the region's creeks and rivers and their habitat value and status; flood protection practices; and laws, policies and regulations. The training would include project proponents and the agencies' representatives, allowing for many perspectives to be shared and discussed. Such a program could include descriptions and examples of flood control practices and needs, from the traditional to the innovative, including the status of the flood protection systems in the region; and the regional laws, policies and regulations and their purpose, agency mandates, and the permitting process could be explained as related to watersheds and the species that inhabit them.

b. Recommendation: Cultivate Staff Expertise (Regulatory and Resource Agencies)

Agencies have expertise in their laws and policies, as well as the environment and species they protect. However, project topic expertise, such as flood protection projects, is not specifically fostered. If staff project expertise was improved, it is likely permitting would be more efficient as agency staff would need less time to become familiar with practices and techniques of the proposed work. Agencies should consider developing a level of expertise among staff for projects types that are in high demand (e.g., habitat restoration and flood protection projects).

II. Proposed Project

Flood protection projects are a high priority for the region because they offer life and property protection for our urbanized Bay Area. Bay Area watersheds vary in their land use, topographies and ecosystems and tailoring appropriate designs to each watershed requires multiple disciplines.

Concurrently, the regulatory and resource agencies have acknowledged that a watershed-based approach is necessary to improve and restore water quality, healthy Bay and riparian ecosystems, and the species that inhabit them. When reviewing a proposed project the regulatory and resource agencies are now considering the entire watershed rather than a segment of a waterway, as well as wildlife corridors and the importance of connectivity for biological species and physical processes. Some flood protection projects in the Bay Area reflect this change in regulatory perspective, while others continue in the traditional flood protection methods and practices. The regulatory and resources agencies have determined, but perhaps not fully articulated, that while it is not possible to create new watersheds, it is possible to restore diverted systems, and their habitat and functions within and adjacent to existing flood protection systems.

Working together, flood protection and regulatory and resource agencies can create innovative projects that improve flood protection, restore habitat and ecological function and support species. But in doing this, it is important to recognize that no project is perfect and even the best of projects will have unavoidable impacts on the existing system, natural or built. Therefore, impacts should be minimized wherever possible. Inclusion of project features that widen floodplains, create floodwater basins, and improve species, habitat and water quality should be part of the project design, rather than late additions or requirements by agencies through mitigation.

Climate change will likely result in more frequent storms, increased precipitation and localized flooding as Bay waters move inland and up tidal waterways. These potential future conditions, along with the need to support wildlife suggest that a rethinking of flood protection practices and needs is important, especially for systems with traditional trapezoidal, concrete lined channel designs. The region already has some resource management plans, such as the Watershed Management Initiative, Salmon Recovery Plan, the Tidal Marsh Recovery Plan, and the Science Update to the Baylands Ecological Habitat Goals, which provide information on elements of creeks, streams, channels and tidal marshes that support species recovery and could be incorporated into flood protection programs.

a. Recommendation: Develop a Watershed Approach (Flood Protection Managers)

Reexamine flood protection projects and programs within each watershed from the headwaters to the Bay and identify ways to improve and reconnect the biological and physical systems. This is a long term planning process that requires biologists, planners, and engineers to take an integrated approach to the work. In addition, integrate agency staff from the cities and counties within the watershed, rather than by municipal jurisdictions to provide benefits throughout the watershed. Identify where dams and

other built infrastructure can be removed or upgraded; how streams and creeks can be “daylighted” and realigned; where multi-purpose flood basins can be located; and where floodplains can be widened and reconnected to marshes or the Bay.

If a flood protection agency, city or county has not started watershed level planning, this effort should be initiated. This can begin with completing an inventory of each watershed within the service area. The inventory should include: an analysis of the geomorphological processes to determine the appropriate flow regime for the creeks and channels; identifying areas where watershed and habitat features can be established; identifying ways to reconnect the system to marshes; and developing methods to remove constrictions to sediment and water flow through the system. These actions would support the development of a watershed approach to flood protection in each service region.

b. Recommendation: Support through Technical Assistance (Regulatory & Resource Agencies)

When flood protection agencies are undertaking this planning process, or initiating it, regulatory and resource agencies need to recognize their effort, the resources necessary to undertake and complete the process, and its significance to the watersheds and the Bay.

Through this recognition, the regulatory and resource agencies should act as a resource, providing technical guidance and supporting the overall goal through consistent and timely participation in meetings and document review. Because completing a watershed plan will require input through meetings and document review, significant staff time should be allocated for this activity.

c. Recommendation: Develop Best Management Practices (All)

Examine existing streambed maintenance programs for established practices approved by regulatory and resource agencies (e.g., Santa Clara Valley Water District, Napa County, Sonoma County). For ongoing stream and channel maintenance, the resource and regulatory agencies should work with the Bay Area Flood Protection Agencies Association (BAFPAA) to develop a set of regional best management practices that account for and minimize impacts to habitat, species and water quality. Once developed and refined, distribute the best management practices to flood protection agencies at the state, county and city level for incorporation into regular flood protection management and maintenance practices.

d. Recommendation: Stream Maintenance and Ten Year Permits (Flood Protection Managers and Regulatory Agencies)

Flood protection managers should develop stream maintenance plans for each watershed within the agencies’ service area and request ten year permits for these activities. Incorporate best management practices (developed through the above process) into the project proposal; hold an annual meeting of agencies to review

upcoming work; develop an annual work plan and report on the previous year's work; and have placeholders for unforeseen work that may be necessary during the ten-year period. The Santa Clara Valley Water District's Stream Maintenance Program provides a good example of this type of planning and coordination activity. As capital projects are permitted, consider including maintenance activities as part of the initial permitted activity.

e. Recommendation: Reconnect Flood Channels to Marsh/Bay (Flood Protection Managers)

Throughout the Bay region there are areas where creeks, streams and flood channels significantly change direction via channelization along the Bay front, diked baylands, or former salt ponds. Adjacent to these waterways are properties that are either in active restoration or targeted for restoration over time. These properties are an opportunity for the waterways to reconnect the floodplain to the marsh through the creation of a more natural creek, stream or channel terminating in the marsh plain or Bay. Cities and counties should work with flood protection agencies, restoration managers and watershed managers to realign these waterways to a more natural form supportive of marsh and Bay ecosystems.

III. Outreach and Coordination

Large projects with multiple stakeholders require significant outreach and coordination. Outreach can take many forms and involves the agencies that have influence on project development and approval, as well as the general public who may be impacted by the project and property owners immediately adjacent to the project. The local community is an important resource in the planning phase, as stakeholders often have specific information about benefits that the creeks and streams provide. Outreach to these groups can impact the project as public comment is solicited and received during the environmental review process; during presentations to Boards and Commissions for project review, approval and funding; and as part of the permit process. Appropriate outreach can help planners understand what the community values and can help generate ideas to improve recreational and habitat value within a flood control infrastructure project. Marin County Watershed Program provides a good example of a significant public outreach program and technical advisory group that is well utilized.

Similar to public outreach, coordination efforts with permitting agencies are helpful to both the applicant and the agencies. It provides an opportunity for applicants to hear early and first-hand the agencies' main concerns, discuss the different approaches or policy conflicts, and begin to problem solve. While various coordination opportunities exist, they are not fully utilized and attendance at meetings is sporadic and not mandatory. Further, the existing coordination efforts for permits do not have an agreed upon structure, or conflict resolution and decision making process. In order to improve the permitting process, it appears that an additional interagency coordination structure and process would be beneficial as it would

increase coordination and improve consistency of information provided and promote the understanding of projects and the decision making process.

Timing is an important element in coordination activities. In order to garner information and advice, coordinating with agencies early on in the project development process creates a climate in which creative solutions can be implemented and support for the project can be established at the community and agency level. In contrast, conferring with agencies when the project is at 90% design provides little room for compromise or necessary adjustments to the project. Projects that have significant agency support when entering the permit process are often those that have coordinated early and often as the project was being developed.

a. Recommendation: Public Outreach Program (Flood Protection Managers)

Develop, engage, and sustain a robust public outreach program to gain insight into community needs and desires, support for the project(s), and an informed constituency. If possible use a facilitator to assist in designing and implementing the meeting. Develop a web page to keep project stakeholders informed and to post key documents.

b. Recommendation: Interagency Coordination (All)

Project proponents should request and set up an interagency project coordination team early in the project development, as early as its conceptual design phase. Coordinating at the early design phase should be recognized as technical advice from the agencies and not regulatory approval. This allows the regulatory and resource agencies to provide technical advice and join in discussions and provide input about the potential alternative solutions and their benefits and challenges prior to decisions being made about the proposed solutions. While it is recognized that many agencies may lack the resources to attend these meetings, agencies should make every effort to have a staff member involved early on in a project to prevent future issues and project delays.

c. Recommendation: Project Element Guidance (Regulatory and Resource Agencies)

The regulatory and resource agencies should consider developing guidance regarding project features that when implemented in appropriate locations, would enhance species, habitat, water quality and the watershed. Look to the Salmon and Tidal Marsh Recovery Plans, current habitat conservations plans, and others such as the Baylands Habitat Goals Update for inspiration.

d. Recommendation: Develop Flood Protection Coordination Process and Decision-Making Structure (All)

The regulatory and resource agencies, in conjunction with the flood protection agencies, should establish a project review structure and decision making process similar to the operations of the Dredged Material Management Office. The process and meeting frequency of such a structured coordination body would need to be tailored to the specific needs of flood protection projects.

IV. Application Package

Incomplete or insufficient project information provided by the applicant is a common problem that hinders or stalls projects at the outset of the regulatory process. Providing incomplete information upfront or changing the project/information during the process can cause delays in permitting. The lack of complete information may be the result of the following: (1) the project information may not be written in a way that elicits the agency staff's full understanding of the project; (2) the applicants may not have all the project information, but are hoping to start the process in an effort to move the permitting forward; (3) the applicant may not be aware of an information need, and; (4) application completeness can be delayed because some applications rely on other "permits" being issued, such as biological opinions.

a. Recommendation: Improve the Application (Regulatory and Resource Agencies)

Use the Joint Aquatic Resource Permit Application (JARPA) as a starting point, revising it to create an application specific to flood protection projects – both maintenance and innovative capital improvement (realignment) projects. Rewrite the application questions so they focus on flood protection issues, impacts, and improvements. The revised application should include instructions that clearly explain the permitting process and which documents are necessary for filing an application complete (i.e., State Lands Commission lease needed for BCDC permit filing, etc.).

b. Recommendation: Jurisdiction Description (Regulatory and Resource Agencies)

Consider ways to clearly communicate jurisdiction, related boundaries, and areas of special ecological importance to applicants. Agencies should consider re-evaluating and/or reaffirming jurisdictions for tidal creeks to provide better guidance to flood protection projects where appropriate.

c. Recommendation: Permit Process Guidance and Workshops (Regulatory and Resource Agencies)

The agencies should provide guidance regarding permit sequencing and timing so that it is clearly laid out for applicants. This information should be provided online with links to other agency websites so forms and requirements can be easily found and used by applicants. Holding biannual permitting workshops to explain and answer questions about the permitting process from project proponents or other interested parties may improve applicant knowledge, and result in better project information provided to the different permitting agencies.

d. Recommendation: Project Schedule (Flood Protection Managers)

Project proponents often do not allow sufficient time for the permitting process. Efforts should be made to ensure time is available in the project schedule for the permitting process. Early coordination will help move projects forward more quickly, as will providing necessary information in a timely manner. Keep in mind that large projects

that impact habitat must go through the public review processes and permits are likely to require Board or Commission votes, which increases the permitting time.

e. Recommendation: Modeling Approach (All)

Using multiple models for flood protection projects requires agencies to learn about the approach that applicants used and can create a delay in the permit process. Evaluate existing models and modeling approaches to identify the best approaches for modeling flood protection alternatives. Select modeling approaches that are approvable by the regulatory community, and incorporate the expertise of the San Francisco Bay Regional Water Quality Control Board (Water Board) and FEMA regarding validity of modeling approaches and modeling future conditions such as sea level rise. Use the identified model and modeling approaches for evaluation of flood protection throughout the Bay Area.

f. Recommendation: Minimization and Mitigation Measures (Flood Protection Managers)

If pre-application discussions with regulatory and resource agencies have identified minimization and mitigation measures, include these measures into the project description and application. This allows the agencies to permit the project in a more expeditious fashion because the project mitigation is included in the design rather than as an extra project element that is required post-design.

g. Recommendation: Innovative Design Features (Flood Protection Managers)

When applying for a permit with innovative features, frame the project in a way that provides clear rationale for the project elements, practices, and monitoring to ensure success. Use the best available scientific information, and provide citations and examples of where the techniques have been successfully used as the basis for design. When possible, present information that decreases uncertainty and measures that increase the probability of success of the innovative component(s). Further, if an impact is identified that will prompt a policy issue but that also provides a benefit and is aligned with another policy, identify both policy issues and describe the value of the action. Do not assume that the agency has the same information you have about similar projects completed in other regions.

h. Recommendation: Application Package (Flood Protection Managers)

In providing the initial application package to the regulatory agencies, a complete project description, project maps and biological assessment should be included. This information is necessary for the U S Army Corps of Engineers (USACE) staff to send out a public notice of the project and to initiate threatened and endangered species consultations with federal resource agencies on behalf of the applicant. Because the federal agency consultation process can be lengthy, it is important to initiate it as early as possible in the process. Several of the state and federal regulatory agencies cannot file an application complete without issuance of biological opinions or incidental take permits from the resource agencies.

i. Recommendation: Response to Information Request (Flood Protection Managers)

Once the initial application has been submitted, regulatory agencies will respond in writing requesting additional information necessary to file the application complete. Provide complete responses as soon as they become available, because a complete application is necessary for project review and permit issuance. Work with the agencies to develop a realistic permitting timeline that incorporates the appropriate amount of time for obtaining other required permits and for Board or Commission review.

j. Recommendation: Understand Permit Schedule (All)

Once an application is received, the analysts should work with the other regulatory and resource agencies and flood the protection manager to develop a schedule that clearly identifies all permitting components, including dependencies of the permitting process, advisory boards, and whether projects are being processed administratively or through a Board or Commission hearing and vote.

V. Improve Permitting Outcomes

In addition to the process itself, the permit outcomes sometimes create challenges for both the permittees and agency staff in managing the project, providing mitigation, and meeting monitoring requirements.

a. Recommendation: CEQA/NEPA Findings (Flood Protection Managers)

The minimization and mitigation measures included in the final CEQA/NEPA document are often converted into terms and conditions in permits, and limit further conversations and collaboration with the agencies to develop the most appropriate measures once the project is further defined. In developing the minimization and mitigation measures during the CEQA/NEPA review process do not be too prescriptive without having initial discussions or gaining feedback from the regulatory and resource agencies.

b. Recommendation: Monitoring (Regulatory and Resource Agencies)

Monitoring requirements often vary significantly between projects that have seemingly similar components and between agencies. This causes confusion for project proponents and agencies alike and perhaps results in less comparative information between similar projects. There is motivation to develop regional monitoring programs for habitat restoration projects and marshes along the Bay given the amount of restoration that is underway, the dynamic changes the Bay is undergoing, the prospect of getting better data and information, as well as potential cost savings.

Regulatory and resource agencies should develop agreed upon metrics and monitoring requirements that can be applied to flood protection projects. It is suggested that longer term monitoring programs, potentially with reduced frequency, may be more valuable to monitor function and trends over time. Long term monitoring may facilitate

adaptation to sea level rise and other climate related changes that may affect watersheds. The monitoring program should incorporate short-term metrics to ensure the establishment of new vegetation or initial implementation of mitigation measures. The long-term monitoring would evaluate the progress of the mitigation/restoration as the site fully matures, and if it is successful and adapting to change over time. To this end, the regulatory and resource agencies should consider authorizing longer time periods for monitoring to achieve habitat features and functions that were targeted by the project.

c. Recommendation: Monitoring Project Success and Adaptation (Flood Protection Managers)

Because the system is changing, and goals for watershed-based flood protection would include increasing habitat features and functions, monitoring should be included as a project element and budgeted appropriately in capital projects. Flood protection managers are already monitoring the system features for storm capacity, vegetation management, and necessary maintenance and repairs. Long-term monitoring for biological features and function can be incorporated into this work, so long as measures are clearly defined for field workers. Staff biologists can interpret this monitoring and report out to regulatory and resource agencies as part of annual progress meetings.

d. Recommendation: Mitigation (Regulatory and Resource Agencies)

There are two general types of mitigation required for flood protection projects – mitigation for temporal and permanent impacts. Temporal impacts tend to be those incurred during maintenance activities, such as sediment and vegetation removal. These impacts are difficult to minimize when restoring stream capacity. Because these impacts are cyclical, and flood protection managers have limited land available for mitigation, repeated mitigation requirements are difficult to fulfill.

Permanent impacts generally involve loss of specific habitat features and function when repairing parts of the system and raising floodwalls or widening banks, etc. In many cases, in-kind mitigation is required for these impacts, and this type of mitigation can be difficult to implement.

As flood protection projects take on a watershed approach, it may be valuable to consider mitigation requirements that address overall watershed benefits, such as restoring reaches upstream as mitigation for loss in another area. This type of mitigation may be out-of-kind, but will benefit the larger watershed function and health. Regulatory and resource agencies should consider the larger watershed when requiring mitigation.

Conversely, flood protection managers may consider including features in the larger projects that promote habitat and species development that they wouldn't ordinarily consider or include, and discuss with the regulatory agencies how these features mitigate for known impacts.

e. Recommendation: Land Stewardship and Endowment Alternatives (All)

When a project requires mitigation, the mitigation site must be managed in perpetuity. In order to ensure that funds are available into the future for this purpose, some regulatory and resource agencies require flood protection agencies to create large endowments for stewardship and management of the mitigation sites. It is important to note that flood protection agencies are public agencies that own the property on which they work. They do not sell the property and are stewards of the land, and therefore are enduring partners in watershed maintenance and restoration. They also receive their funding annually from a guaranteed tax base, and therefore the need to set aside an endowment for maintenance is not necessary. Creating large endowments for stewardship prevents the use of these funds for necessary public projects. While both sides of this argument have merit, it is possible that another remedy could be identified that provides confidence that the mitigation lands will remain cared for and provide habitat benefits into the future and free up funds for public projects. Regulatory and resource agencies and flood managers should enter into a facilitated discussion to identify potential alternate solutions to this issue.

VI. Regional Approach

The Bay Area is facing a crisis and an opportunity with its current flood protection system. The crisis is that the infrastructure is reaching the end of its design life. The need to replace deteriorating infrastructure creates an opening to rethink and redesign projects to provide flood protection, habitat features and community benefits. Because there are several flood protection agencies within the region and many different physical settings, there is no single approach to solving this issue. However, developing common goals and a vision for the region can be a unifying exercise that provides a level of understanding and commitment towards a healthier, better managed system with multiple benefits. For example, the Santa Clara Valley Water District has established goals for its Flood Protection and Stream Stewardship Master Plan. They include:

- To inventory and understand natural flood protection needs and opportunities
- Reduce potential for flood damages
- Healthy creeks and Bay ecosystems: riparian habitats; improving fisheries; and improving tidal and fresh water wetlands
- Clean, safe water in our creeks and bays: pollution reduction; address impaired water bodies; and trash and litter reduction
- Trails and Open Space Opportunities

a. Recommendation: Develop a Partnership (All)

Taking advantage of BAFPA's leadership, create a regional partnership that includes flood protection managers, regulatory and resource agencies all working collaboratively to improve watershed function in the Bay Area. Flood protection agencies would make a commitment to improve watershed function in their projects. This commitment would be demonstrated in improved projects over time, recognizing the constraints that would

make this a long-term effort. Regulatory and resource agencies would make a commitment to work with the flood protection agencies over time to reach this goal. The restoration community would also commit to providing support and expertise to the flood protection agencies and work together to reconnect watersheds to the Bay. Input into the project development would be welcome and provided by flood managers, city planners, restoration community representatives, regulatory and resource agencies.

b. Recommendation: Regional Vision and Goals (All)

The flood protection and associated regulatory and resource community should enter into a process to create a regional vision and goal for flood protection activities in the Bay watershed. These goals could include commitments to reduce damage from flooding, improvements to watershed function, and increased habitat values, providing a stake in the process for all parties.

VII. Political and Management Support

While all of the above recommendations are within the ability and existing regulatory authority of the agencies, the capacity to do this work is unlikely without additional resources, including dedicated staff, additional staff time and funding, and political and management buy-in. Further, participants would need to be committed to make it happen.

a. Recommendation: Program Proposal (All)

Develop a clear outline of a proposed program, identify the resources likely needed and seek high level commitment from the flood protection community and regulatory and resource agency executives.

b. Recommendation: Identify Funding Needs and Sources (All)

The current funding structure may not support the initiation of this effort. Once buy in has occurred, seek funding outside normal agency budgeting process to support the program development, potentially through granting programs or other means of financial support.

c. Recommendation: Increase Staff Capacity (Regulatory & Resource Agencies)

All agencies have suffered staff shortages, either due to budget cuts, retirement, or increased workload. In the future, large capital projects and changing environmental conditions related to climate change are likely to only exacerbate staffing issues because of the necessary additional planning, program adjustments, analysis, and monitoring review that will be required. To address the staff capacity issue, management should seek to increase funding for additional staff and hire the adequate amount of staff to meet the growing needs for future projects.

d. Recommendation. Support Increase in Staff Capacity (Flood Protection Managers)

In order to increase regulatory and resource agency staff capacity, Congress, the Governor, and state legislators need to understand the issues and support increases in

agency budgets and staffing for flood protection purposes. Flood protection managers working with agency managers could join a coalition to advocate for funding and political support at the state and federal level.

Actions	Desired Outcomes	Who
Project Improvements – Short Term		
Watershed Approach: Identify flood protection programs that are undertaking a watershed approach and gather lessons learned, best practices and advice to share with others.	Aligned regulatory and flood protection approach	FPM
Interagency Coordination. At the project level, an interagency project coordination team is incorporated into the conceptual design phase of the project. Agency staff should participate in these coordination efforts to guide project development	Encourage more collaboration and understanding	All
Innovative Design Features. Projects with innovative or adaptive features should include clear rationale for project elements, practices, and monitoring to ensure success, using the best available scientific information to support the design.	Improve flood protection projects for dynamic changes	FPM
Project Element Guidance. Develop guidance regarding flood project features that, where appropriately used, would enhance species, habitat, water quality, and watersheds.	Provide guidance and resource for flood protection managers	R&RA
Information Exchange. Create and use a network to exchange information about successful projects that have undertaken innovative and adaptive flood protection measures.	Improve understanding and knowledge	All
Regulatory Improvements – Short Term		
Jurisdiction Description. Determine whether there is confusion regarding jurisdictions or regional offices that manage tributaries or tidal creeks. If jurisdiction is unclear, agencies can develop better information to reduce or eliminate confusion for project managers. Information on jurisdiction would be ideally provided on the agency's website, and may even include a tool to assist in determination.	Create clarity regarding jurisdictions	R&RA

Permit Process Guidance and Workshops. The regulatory and resource agencies should develop a workshop that would provide guidance on application and permit processes.	Develop workshop agenda and materials	R&RA
Application Process – Short Term		
Project Schedule. Project proponents should allow a minimum of 18 months to obtain all of the permits and approvals for capital projects.	Set realistic expectations for the permit process	FPM
Application Package. Project proponents should provide a complete project description, project maps and biological assessment in the application package at a minimum.	Sufficient information provided to begin the permit and consultation process	FPM
Permit Schedule. For each application received, agency staff and project proponents should develop a comprehensive permitting schedule.	An agreed upon understanding of permit schedule and milestones	All
Response to Information Request. Provide complete responses to agencies as soon as they become available.	Application completeness	FPM
Minimization and Mitigation Measures. If pre-application discussions identify minimization and mitigation measures, build them into the project description and application.	Reduction in analysis time	FPM
CEQA/NEPA Findings: Keep minimization and mitigation measures in the CEQA/NEPA document flexible to allow for more discussion and flexibility in the permit requirements.	Allow for adjustments within the project design and permit requirements	FPM
Regional Flood Protection & Watershed Program – Short Term		
Seek Initial Management Support: The Bay Area Flood Protection Agencies Association (BAFPAA) meets with partners and agency management to discuss the potential to create an improved regulatory program for flood protection projects.	Gain management support for initial work	All

<p>Create the Team: Identify interested staff from flood protection, regulatory and resource agencies to collaborate and guide the effort of improving flood protection projects and regulation in the region. Dedicate time in their workload to undertake this effort.</p>	<p>Identify people willing and able to develop a team and initiate activities to develop a regional program</p>	<p>All</p>
<p>Agreements: Develop initial agreements on goals of work and desired outcomes.</p>	<p>Clear understanding of expectations</p>	<p>All</p>
<p>Outreach Plan: Identify stakeholders in flood protection and watershed enhancement and restoration. Create a meeting plan to inform and solicit participation and support for effort.</p>	<p>Design outreach program to gain political support</p>	<p>All</p>
<p>Coordination Process and Decision-making Structure: The team, working with stakeholders, should develop a proposed project review structure and decision making process. Consider the types of projects, level of review, needed frequency of meetings/review, required agency participation, advisory participation and decision making. Once developed and approved (see below) project decisions by staff would be binding with an appeal process to upper level management.</p>	<p>Develop coordinated approach to flood protection permit processing</p>	<p>All</p>
<p>Feedback and Review. As the regional program emerges, create an iterative review process with management and stakeholders, as well as willing trial projects to determine if the structure can function as designed to improve the process.</p>	<p>Program vetting and stakeholder support</p>	<p>All</p>
<p>Training: The team, or subset, develops a training outline, topics, length of training, schedule, locations, target group, and appropriate trainers.</p>	<p>Available training program to increase expertise</p>	<p>All</p>

Project Improvements - Mid Term		
Initiate a Watershed Approach. Reexamine flood protection projects and programs within each watershed from its headwaters to the Bay and identify ways to improve and reconnect the biological and physical systems.	Initiate the regional program	FPM
Inventory Watersheds. Within each service area, inventory and identify improvements to flood protection using a multi-benefit, watershed approach that incorporates natural features and function. Integrate biologists, planners and engineers in to a cross disciplinary project team.	Clear understanding of potential actions within each watershed to support the regional effort	FPM
Support through Technical Assistance. Regulatory and resource agencies participate in the program development and provide technical support. Agencies attend quarterly meetings and provide document review.	Agency participation and support	R&RA
Public Outreach Program. Working with city and county planners, develop, engage in and sustain a robust public outreach program in developing a watershed approach for local channels. Incorporate community concepts and benefits into project. Develop a project webpage to inform stakeholders and provide access to key documents.	Public supports changes in flood protection program, and has input into design process	FPM
Regulatory Improvements - Mid Term		
Develop New JFPPA Application. Working with flood protection managers, develop a Joint Flood Protection Project Application (JFPPA) and instructions specific to flood protection projects. Create specific sections for maintenance activities and capital projects. Test the new application with representatives from each agency and a flood protection manager. Revise as needed.	Improve application and permit process	R&RA

<p>Permit Process Guidance and Workshops. The agencies should develop and provide guidance on permit sequencing and timing, available on agency websites. In addition, the agency should host biannual permitting workshops to explain and answer questions about the permitting process.</p>	<p>Increase understanding of the permit process</p>	<p>R&RA</p>
<p>Standardized Monitoring. Discuss with flood protection managers their current annual and semi-annual monitoring. Determine how this monitoring could be augmented to support agency needs. Discuss how best to monitor improved habitat and function, and at what intervals and period.</p>	<p>Improve monitoring program to gain better data on individual watersheds and regionally. Improve project management</p>	<p>All</p>
<p>Regional Flood Protection & Watershed Program - Mid Term</p>		
<p>Program Proposal. Develop a clear outline of a proposed Regional Flood Protection & Watershed Program, identify the resources needed and seek high level commitment from the flood protection community and regulatory and resource agency executives.</p>	<p>Develop a regional plan for flood protection and watershed management</p>	<p>All</p>
<p>Cultivate Staff Expertise. Within each agency identify staff that can provide technical assistance on watersheds, flood management practices, and fluvial and tidal habitat function both for agency staff and project proponents. Cultivate these staff and increase their knowledge. Dedicate time in their workload so they can provide technical support to others.</p>	<p>Increase staff knowledge on watersheds, flood management, ecosystem function and improve permit processing</p>	<p>R&RA</p>
<p>Training. Develop training modules per plan discussed above, pilot the training modules with small groups of regulatory and resource agencies and flood protection managers.</p>	<p>Available and vetted training materials</p>	<p>All</p>
<p>Funding needs and Sources. Identify and seek funding sources for improved programming and augmentation of agency budgets to build capacity for the program.</p>	<p>Identify potential funding sources for program change</p>	<p>All</p>

Project Improvements - Mid to Long Term		
Watershed Approach. Continue to share lessons learned, and successes of projects underway. Begin to plan improvements for more constrained watersheds, including those that are densely populated.	Build expertise, share lessons learned	All
Best Management Practices (BMP). Create a work group that would review stream and channel maintenance activities through out the region with the goal of creating best management practices appropriate for riparian and tidal flood protection systems. Vet the proposed BMPs through stakeholders, adjust as necessary and provide refined BMPs to regulatory and resource agencies for review and approval.	Development of best management practices that can be applied in appropriate settings	All
Distribute Best Management Practices. Once approved, distribute to flood protection agencies at the state, county and city level for incorporation into regular flood protection management and maintenance practices.	Create a standard of practice in the region	
Regulatory Improvements - Mid to Long Term		
Implement JFPPA Application. Once the application has been finalized, agencies make any necessary regulation changes to officially use the new form.	More efficient application process	R&RA
Modeling Approach. Develop a technical work group to gather information about the appropriate models for flood protection, riparian and tidal creeks, channels and marshes. Draft a white paper that describes these models, the benefits and limitations of each, and their applicability to different types of watershed/flood protection projects. Host technical workshops to assist the region in determining appropriate modeling approaches.	Identify a standard modeling approach for use in the region	All

<p>Identify model approaches to be used when developing and evaluating flood protection projects.</p> <p>Seek support from the regulatory and resource agencies in determining appropriate model.</p> <p>Use these models in support of the permit application process.</p>		
<p>Modeling Training. Develop and host training for agencies in modeling approach, assumptions and validity.</p>	A better understanding of modeling outcomes and applicability to flood protection alternatives	
<p>Increase Staff Capacity. Management should seek increase in funding for additional staff and hire staff sufficient to meet the need.</p>	Increase regulatory staff capacity	R&RA
<p>Support Increase in Staff Capacity. Flood protection agencies, cities, and counties and non governmental organizations should request Congress and state legislators support increases in agency budgets and staffing to build capacity to develop innovative flood protection projects that meet the region’s changing needs.</p>	Provide political support for increase in agency funding to address flood protection issues	FPM
<p>Training. Offer program flood protection and regulatory and resource agency training on a regular basis, biannually (every two years) as needed. Create an archive so new staff can view as needed.</p>	Sustained and supported expertise in flood protection, riparian and tidal issues	All
<p>Regional Flood Protection & Watershed Program - Mid to Long Term</p>		
<p>Develop a Partnership. Create a regional partnership to improve watershed function in the Bay Area.</p>	Improved coordination and partnership to provide flood protection in a watershed setting, increase region’s flood resilience and ecological health	All
<p>Regional Vision and Goals. Enter into a facilitated process to create a regional vision and goal for watershed-based flood protection.</p>	Create common goals and vision for Bay Area watersheds	All

Project Improvements - Long Term		
Reunite Flood Channels to Marsh/Bay. Reconnect creeks, streams and flood channels to marshes or habitat restoration projects.	Increase ecosystem function, improve flood management	FPM
Habitat Benefits Evaluation. In preparation for reconnecting watersheds to marshes and the Bay, regulatory and resource agencies evaluate the water quality, habitat and species benefits, as well as the potential impacts of the initial work, and analyze the long term benefits to the ecosystem and its function, and dependent species.	Improve understanding of benefits of watershed approach. Enable the agencies to balance impacts of realignment with future benefits	R&RA
Mitigation. Identify measures that can be applied within flood protection systems that can mitigate for repetitive maintenance activities, such as vegetation removal. Consider advanced mitigation activities to support habitat function when maintenance occurs.	Improve outcomes for mitigation projects and flood protection projects	R&RA
Mitigation. Determine and agree upon aspects of watershed based-flood protection that is self-mitigating.	Reduce need for mitigation for projects increasing ecological function	R&RA
Regulatory Improvements - Long Term		
Stream Maintenance Program: Develop ten-year stream maintenance plans for each watershed within service area and request ten year permits for these activities.	Improve habitat benefits, reduce permit workload and create more certainty for flood protection managers	FPM
Ten-Year Stream Maintenance Permits. Using the ten-year stream maintenance plans, authorize these plans for ten-year periods. Work with flood protection managers to provide input for success plans in advance of applications.	Issue long term permits for routine work	R&RA
Stewardship and Endowments. Consider whether there is a better way to ensure stewardship and maintenance mitigation sites that are publicly held lands beyond requiring large endowments for this purpose.	Improved understanding of land stewardship and improve use of public funds	All

Regional Flood Protection & Watershed Program - Long Term		
Partnering. Over time, continue to meet to discuss and support watershed planning and flood protection projects. Refine program and process, as well as adaptive management measures to address changing system.	Improved partnership in the region, provide a forum to continue to improve flood protection	All
Constrained Channels. Using lessons learned and improved processes, tackle the most difficult and constrained flood protection projects to provide community and habitat benefits to these areas as well.	Improved flood protection and ecological function in the most constrained channels in the region	All

VIII. Who We Are

This regulatory guidance document was developed through *Flood Control 2.0: Rebuilding Habitat and Shoreline Resilience through a New Generation of Flood Control Channel Design and Management*, an EPA-funded partnership of the San Francisco Bay Conservation and Development Commission (BCDC), the San Francisco Estuary Partnership (SFEP), the San Francisco Bay Joint Venture (SFBJV), and the San Francisco Estuary Institute (SFEI). This document was only possible through the cooperation of the flood protection, regulatory and resource agencies who candidly provided their thoughts and suggestions on flood protection projects and the regulatory process in the San Francisco Bay Region. The primary author for this paper is Brenda Goeden, Sediment Program Manager at the San Francisco Bay Conservation and Development Commission, with assistance from Anniken Lydon, Pascale Soumoy, Alex Braud, and Cherise Johnson on the Sediment Management Team. For information about this document please contact Brenda Goeden at 415.352.3600.

More information about the Flood Control 2.0 project & products at floodcontrol.sfei.org

Appendix A

This tips document is from multiple sources, including the San Mateo Stream and Wetland Permitting Guide; State Guide to Watershed Permitting; and Marin County Wetland Permit Guide, and is relevant to any permitting action in the Bay Area.

Practical Tips for Getting Your Project Approved

1. **Consult Early.** Consultation with permitting and regulatory agencies should begin as early as possible in planning your project.

2. **Carefully Select and Design Your Site.** Evaluate several alternative sites before making your choice. It is also important to conduct an environmental constraints analysis prior to site design.



3. **Have Written Descriptions and Site Plans Available.** You may need to provide a written description as well as a map and site plan of your project at your first meeting with each agency.

4. **Learn the Rules.** Take time to study the protocols and regulations of those agencies that must approve your project. Study all applicable state, local and federal agency permitting requirements.

5. **Know the Players.** Become familiar with the regulators and how they function.

6. **Approach the Process with a Positive, Non-adversarial Attitude.** It is generally counterproductive to resist the permit process as you are going through it. Indeed the squeaky wheel gets the grease. But be polite!

7. **Reduce Adverse Environmental Impacts.** Design your project to eliminate or reduce as many potential environmental impacts as possible. Consider environmentally superior alternatives. Incorporate the

suggestions you learned during early consultation.

8. **Involve the Public.** Plan a public participation program. Meet with members of your community to get their ideas and views of your proposed project.

9. **Pay Attention to Details.** Follow all the rules. Respond promptly to requests for information. Do not cut corners.

10. **Be Willing to Negotiate.** The permit process has been established because of the public concern for protecting the waterways and this is the prime responsibility of the agency reviewer. The reviewers are sensitive to the concerns of individuals and property rights, and are willing to consider alternative project designs to meet the needs of the property owner and still protect natural resources.



11. **When in Doubt, Ask.** If you are not sure whether your project needs a permit, ask. Going ahead without all the proper permits or without following conditions of approval very likely will cost you time and money.

12. **Get Everything in Writing.** Request each agency you contact to put everything in writing. This will help prevent any misunderstandings.

Appendix B

A Stepwise Process for Salmon Features within a Watershed

The National Marine Fisheries (NMFS) has evaluated and identified the most significant threats to the continued existence of the San Francisco Bay segment of the Central California Coastal (CCC) steelhead, these include water diversions and impoundments; residential and commercial development; roads and railroads; and channel modifications (NMFS Steelhead Recovery Plan Volume IV). Generally, the entire (CCC) steelhead distinct population segments (DPS) has been rated poorly for many indicators of population viability such as estuary/lagoon quality and extent, habitat complexity, sediment quality and quantity, and sediment transport, and other indicators.

Design of flood protection projects can play a significant role in assisting in salmonid recovery. The NMFS Salmonid Recovery Plan provides guidance on how to identify the status of steelhead; identify its current threats; and identify methods and specific actions to improve conservation features and ratings for Bay Area watersheds. Flood protection managers can use the following guidance to identify ways to improve projects in watersheds. The NMFS species recovery plan related to the San Francisco Bay Region is the *Volume IV- Central California Coast Steelhead distinct population segments (DPS) Plan*. Additional information will be come available as the draft salmonid recovery plan becomes final.

Follow the steps below to identify what design features and methods can be used to improve steelhead habitat with the watershed.

1. Identify whether your project area is located within the:
 - “Interior San Francisco Bay Diversity Stratum Results” (Petaluma River, Sonoma Creek, Napa River Green Valley/Suisun Creek, Alameda Creek, Coyote Creek), or
 - “Coastal S.F. Bay” (Corte Madre Creek, Novato Creek, Stevens Creek, Guadalupe River and San Francisco Creek)
2. Find the heading related to the diversity stratum (segment of the DPS) for the project’s river or creek and read the summary of the life stages and requirements for different salmonids and the identification of the most significant threats within that area.
3. After reading the summary of the diversity stratum, turn to the section labeled “DPS Conservation Assessment Planning Methods (CAP) Viability Results” and associated Table 7, which identifies the current NMFS ratings for the summarized life stage viability for multiple attributes of the specific creek/river watershed or the watershed near the project area and with similar characteristics.
4. Turn to Table 8 to view the conservation target ratings that NMFS has set for the specific creek or river.
5. Turn to Table 9 to for an overview and identification of the threats that pose the highest risk to the populations in or near your watershed.

6. In the appendices, identify the section/summary for the individual creek or river watershed that is relevant to your project. Read through this section, focusing on the tables of specific actions to improve the attribute ratings or decrease threats levels to various salmonid life stages within your watershed.
7. Identify stream management methods or project elements that can feasibly be incorporate into the project early in the design to help improve the status of various salmonid life stages in the project's creek or stream.
8. Turn to *Volume V- Appendix B –Climate Change* Table 3 and Table 7 to assess potential threats and potential future vulnerability of populations of salmonids within your watershed as a result of climate change.
9. Begin discussions with NMFS and California Department of Fish and Wildlife (CDFW) and other regulatory and resource agencies on siting and design of the project elements early in the design process and incorporate elements of the recovery strategy or specific recovery actions into your project to allow for prioritized and streamlined consultations with NMFS and CDFW.

Appendix C

Reference Documents

Flood Control. 2.0: San Francisco Bay Area Flood Protection Projects Regulatory Guidance:

<http://www.sfei.org/projects/flood-control-20#content-8-region>

Tidal Marsh Ecological Recovery Plan:

www.fws.gov/sacramento/es/recovery-planning/tidal-marsh/es_recovery_tidal-marsh-recovery.htm

Salmonid Recovery Plans:

www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/recovery_plans_supporting_documents.html

<http://www.dfg.ca.gov/fish/Resources/Coho/CohoRecovery.asp>

<http://www.dfg.ca.gov/fish/Resources/Chinook/CValleyAssessment.asp>

Habitat Conservation Planning:

www.fws.gov/endangered/esa-library/pdf/HCP_Handbook-Draft.pdf

Federal Endangered Species Act

www.fws.gov/endangered/laws-policies/

California Endangered Species Act

www.wildlife.ca.gov/Conservation/CESA

San Francisco Basin Plan

www.swrcb.ca.gov/rwqcb2/water_issues/programs/basin_plan/docs/basin_plan07.pdf

Watershed Management Initiative (2005)

www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/watershed/WMI/WMI_2004_Regionwide_Activities04-12-05.pdf

San Francisco Bay Plan

www.bcdc.ca.gov/plans/sfbay_plan.html

San Francisco Estuary Institute

San Francisco Estuary Institute-Aquatic Science Center. 2016. Changing Channels: Regional Information for Developing Multi-benefit Flood Control Channels at the Bay Interface.

<http://www.sfei.org/documents/changing-channels-regional-information-developing-multi-benefit-flood-control-channels-bay>

Photo courtesy of Dreamstime:

<https://thumbs.dreamstime.com/t/flood-control-channel-los-angeles-county-arroyo-seco-pasadena-just-trickle-runoff-arroyo-seco-drains-54776896.jpg>

Photo courtesy of Delta Stewardship Council:

<http://deltacouncil.ca.gov/sites/default/files/06%20SMMP%2002%20-%20Suisun%20Marsh2.jpg>