



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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~~~~~ **NATIONAL FLOOD INSURANCE PROGRAM** ~~~~~  
THE CHANGING LANDSCAPE OF FLOODPLAIN INSURANCE & REGULATION

by Molly Lawrence, Van Ness Feldman (Seattle, WA)

### INTRODUCTION

For many years, the physical boundaries and laws applicable to the nation's floodplains were fairly static and of relatively little concern. For most property owners and local governments, being in the floodplain meant some occasionally odd, but manageable development restrictions (e.g., electrical outlets placed mid-way up the wall and "critter pads" for cattle grazing near rivers), and the requirement to purchase easily available and generally affordable flood insurance. The last decade, however, has seen significant changes to the floodplain landscape — changes that are ongoing and which are significantly affecting the value, cost to own, and utility of floodplain properties.

This article summarizes the history and key elements of the National Flood Insurance Program (NFIP), and then explains the numerous changes occurring to the Program that are affecting the way we think about and utilize floodplains. These changes relate to three key elements of the NFIP: its floodplain mapping program; the minimum development regulations applicable to floodplains; and flood insurance coverage and rates.

In short, the areas regulated as part of the floodplain are typically expanding at the same time the development regulations and costs for owning and developing in the floodplain are increasing (in some cases exponentially). This is negatively affecting the value, marketability, and utility of properties within the floodplain, and leaving many property owners — who reasonably believed they owned valuable and useful property — in difficult times. Similarly, many local governments have been caught in the middle between conflicting state and federal "mandates" both to permit and restrict development, which are likely to preclude future development in areas that for decades have been urban and economic centers.

### NATIONAL FLOOD INSURANCE PROGRAM: PRIMARY COMPONENTS

Congress passed the National Flood Insurance Act in 1968 following several significant flooding disasters that triggered requests to the federal government for financial assistance. The purposes of the NFIP were two-fold: (1) to make flood insurance "available on a nationwide basis through the cooperative efforts of the Federal Government and the private insurance industry"; and (2) to reduce future flood damage through community floodplain regulations. 42 U.S.C. § 4001. Congress hoped to reduce federal expenditures for flood losses and disaster assistance by providing flood insurance at reasonable rates within communities that choose to participate in the program. The program proved popular. For instance, more than 290 communities in the State of Washington currently participate in the NFIP, including 38 counties, over 200 cities and towns, and 10 tribal reservations. As of August 2014, only 14 Washington communities did not participate in the NFIP.

## Floodplains

### NFIP Components

### Floodplain Mapping

### "Base Flood" Area

### "No Build" Zone

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The Federal Emergency Management Agency (FEMA) is the federal agency charged with administering NFIP.

#### THE FOUR BASIC COMPONENTS OF THE NFIP ARE:

- 1) the identification and mapping of flood-prone communities
- 2) the development of minimum development standards applicable within the floodplain that local jurisdictions must adopt and enforce to qualify to participate in the NFIP
- 3) the provision of flood insurance
- 4) the development of a community rating system that offers communities discounted flood insurance premiums if they adopt flood management regulations that exceed FEMA's minimum criteria

Each of these components is explained briefly below.

#### Identification and Mapping of Flood-Prone Communities

As a foundational step to implementing the NFIP, FEMA must determine "who's in and who's out," i.e., which properties are within the designated floodplain and which are outside the floodplain. To make this determination, FEMA assesses the flood risk within each flood-prone community by conducting a Flood Insurance Study (FIS), which typically relies on computer and engineering models and statistical techniques. FEMA converts the results of each local FIS onto a map referred to as a Flood Insurance Rate Map (FIRM), which is subject to public review and administrative and judicial appeal processes. The flood risk information contained in the FIS and the resulting FIRM form the technical basis for the administration of the NFIP.

The primary area delineated on a FIRM is known as the Special Flood Hazard Area (SFHA), which is the area anticipated to be inundated by flood water in a 100-year flood event, known as the "base flood." While the name suggests that the "base flood" is the flood that occurs only once every 100 years, in fact, the NFIP defines the base-flood as that flood having a one percent chance of occurring in any given year. 44 C.F.R. §59.1. As a result, many regions around the county have experienced several base (100-year) flood events within a few years or a few decades of one another. Identification of a property as within a SFHA triggers mandatory flood insurance purchase requirements under the NFIP, as well as the application of additional layers of development regulations.

FEMA uses the water levels from the base flood to determine the scope of the SFHA/floodplain — i.e., the area measured horizontally over the land which will be inundated with water in the base flood — and to establish the "base flood elevation" (BFE) for the floodplain area — i.e., the maximum vertical elevation of the water anticipated during a base flood event.

In many regions, FEMA also uses the FIS to establish the "regulatory floodway." The regulatory floodway is defined as "the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height," which is typically (but not always) one foot. 44 C.F.R. §59.1. Historically, the development regulations applicable within the floodway have been significantly more restrictive than those applicable in the balance of the floodplain, making it generally a "no build" zone.

#### Minimum Floodplain Development Standards

Community participation in the NFIP is technically voluntary. However, for property owners within a jurisdiction to be able to obtain flood insurance through the NFIP, their local community must participate in the Program. To qualify, local jurisdictions must adopt flood hazard regulations at least as stringent as FEMA's adopted minimum development standard. FEMA may not issue flood insurance to property owners if a local floodplain ordinance is not in place that at least meets these minimum criteria. 42 U.S.C. § 4012(c)(2); 44 C.F.R. §59.22(a)(3).

FEMA's existing minimum standards are set forth in its regulations at 44 C.F.R. §60.3 and cover a range of topics relevant to protecting people and property from flood damage (e.g., elevation requirements, construction materials and standards, anchoring of structures and outdoor storage tanks, etc.). Additional standards for mudslide prone areas and flood-related erosion prone areas are set forth at 44 C.F.R. §60.4 and 44 C.F.R. §60.5. Key amongst these standards is the requirement that any new or substantially improved residential structure in the SFHA be elevated at least one foot above the BFE, and that all new or substantially improved commercial structures in the SFHA be elevated or otherwise flood proofed to at least BFE.

The NFIP defines "substantial improvements" as "[a]ny repair, reconstruction, or improvement of a structure the cost of which equals or exceeds 50 percent of the market value of the structure either (a) before the improvement or repair started, or (b) if the structure has been damaged and is being restored, before the damage occurred." 44 CFR § 59.1. The term substantial improvement includes structures that have incurred "substantial damage" regardless of the actual repair work performed. The term does not, however, include either: (1) any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or (2) any



**Floodplains**

**“Substantial Improvement” Standard**

**FEMA Review**

**Flood Insurance**

**Higher Standards**

**CRS Program**

**2013 Manual**

alteration of a “historic structure,” provided that the alteration will not preclude the structure’s continued designation as a “historic structure.” *Id.*

When a building within the floodplain is significantly damaged by a flood or other event, repairs are evaluated under the “substantial improvement” standard. If the cost of restoring a structure to its pre-damaged condition equals or exceeds 50 percent of the market value of the structure before the damage occurred, the entire structure must be brought into compliance with the NFIP standards for new construction. (This is a very abbreviated explanation of the minimum NFIP standards. See 44 C.F.R §60.3, §60.4, and §60.5 for additional information).

FEMA (with the assistance of the state liaisons) monitors each participating community to ensure that they have adopted an ordinance that meets or exceeds the NFIP’s minimum development standards and to ensure that they are effectively enforcing the ordinance. If communities do not adequately enforce their floodplain management regulations, FEMA may place them on probation and potentially suspend them from the NFIP. While FEMA has very rarely invoked either sanction, doing so is a significant threat for NFIP participating communities because suspension means that property owners within the suspended jurisdiction may no longer purchase flood insurance policies through the NFIP — which can trigger default under any federally-backed loan.

**Provision of Flood Insurance**

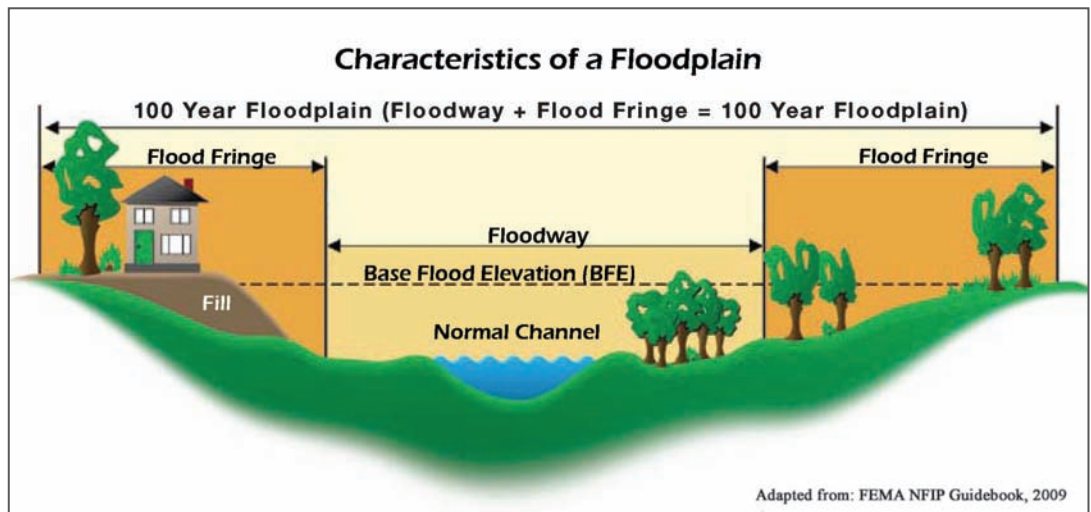
Congress authorized FEMA to “establish and carry out a national flood insurance program.” 42 U.S.C. § 4011. FEMA must provide flood insurance to communities which have indicated a desire to participate in the Program and which have adopted floodplain land use controls at least as restrictive as FEMA’s minimum flood hazard criteria (discussed above).

FEMA provides flood insurance through arrangements with private sector property insurance companies and agents. For residential homebuilders and owners, NFIP based insurance is often the only flood insurance available. Coverage limits top out at \$250,000 for the structure, and another \$100,000 for the contents. By comparison, commercial builders and owners often purchase supplemental flood insurance on the private market because the NFIP coverage limits are relatively low (topping out at \$500,000 for the structure and \$500,000 for the contents). Commercial owners often use NFIP based insurance for smaller claims and/or to cover the deductible on their private policies.

**Community Rating System**

The Community Rating System (CRS) is a voluntary program through which local governments can reduce flood insurance rates paid by constituents within their jurisdictions by adopting floodplain development standards that are more restrictive than the NFIP minimum development standards. Several counties in Washington, including King, Pierce, and Snohomish counties, have taken advantage of the CRS program by adopting significantly more restrictive development standards in exchange for lower insurance rates for their constituents.

FEMA periodically updates its CRS Coordinator’s Manual, which is a guidebook for the CRS and sets the criteria for CRS classification. It explains how the CRS Program operates, what is credited, and how credits are calculated. Although it is primarily a reference for CRS activities and credits, it can also help guide communities that want to design or improve their floodplain management programs. FEMA issued the most recent Manual in 2013, which remains effective through 2016. Many of the changes implemented as part of the 2013 update reflect changes suggested by the National Marine Fisheries Service (NMFS) as part of Endangered Species Act consultations discussed in Section V below, including providing credits for protecting natural floodplain functions and accounting for future conditions such as climate change.



## FEMA'S FLOODPLAIN MAPS: ONGOING UPDATES

## Floodplains

## Map Updates

The first major and ongoing change to the NFIP relates to the mapping program. The NFIP provides that FEMA should review the FIRMs at least once every five years to assess the need to update the floodplain designations and flood risk zones. 42 U.S.C. §§ 4101(e), (f)(1). In practice, however, before the early 2000s, FEMA had not significantly updated the FIRMs for most jurisdictions in more than 15-20 years.

## Broader Floodplains

In the early 2000s, FEMA began a national project called “Map Modernization” or “Map Mod” to update the FIRMs and make them available to the public in digital form. In addition to mapping prior FIS results on updated topographic maps, in some jurisdictions FEMA also updated the underlying engineering analyses used to create the maps. In many locations, these changes (topography, changes in patterns and degree of land development, and mapping technology) have yielded significantly broader floodplains and floodways than were shown previously.

## Levees Protocol

Further, changes in the protocol for mapping levees have also triggered significant changes to the nation’s FIRMs. For several decades, FEMA had not actually required scientific documentation to demonstrate a levee’s reliability. The agency had largely just assumed levees provided 100-year flood protection and consequently mapped areas landward of those levees as outside the floodplain. Over time, however, conditions had changed and undermined the efficacy of many levees (e.g., poor maintenance, erosion, sediment build up in the river, etc.). In response, in August of 2005 (just weeks before Hurricane Katrina), FEMA issued “Memorandum 34” to NFIP participating jurisdictions around the country requiring them to produce documentation demonstrating that their levees met FEMA’s accreditation standards before they could be included in the updated floodplain maps. These accreditation standards require documentation of freeboard, compliance with engineering standards, and ongoing levee maintenance. See 44 C.F.R. § 65.10 for a complete listing of FEMA’s levee accreditation standards.

## Levee Accreditation

In many cases, local jurisdictions lack the records necessary to demonstrate compliance with FEMA’s accreditation standards. In those cases, FEMA’s policy had been to map the area as though the levee did not exist (i.e., “without levees”). For example, in King County, Washington, the County and affected cities were unable to produce the necessary documentation to establish that the levees along the Green River just south of Seattle meet accreditation standards (with one exception, the “Tukwila 205”). Consequently, in 2007 (and then again in 2010), FEMA issued new preliminary floodplain maps showing significant portions of Kent, Tukwila, Auburn, and Renton within the floodplain for first time since inception of the NFIP. (These maps have yet to be finalized as explained below). This is the fifth largest industrial area in the country and is an industrial manufacturing and storage hub for the west coast.

## “Without Levees” Policy

The effect of levee de-accreditation was felt across the country with myriad individuals and local jurisdictions complaining to Congress about FEMA’s levee mapping procedures. In response, in February 2011, twenty seven US Senators sent a letter to Craig Fugate, then Director of FEMA, requesting that FEMA revisit its “without levees” policy. Fugate agreed and in March 2011 issued a response stating that FEMA would place all pending FIRMs on hold that involved the “without levees” analysis and re-evaluate that policy.

## Levee Mapping Protocol

Since then, FEMA has been working on a revised levee mapping protocol. In December 2011, FEMA issued a proposed new protocol for public review and comment. In the summer of 2013 FEMA issued its final procedures and operational guidance. FEMA, *Analysis and Mapping Procedures for Non-Accredited Levees – A New Approach* (2013); FEMA, *Operational Guidance 12-13: Non-Accredited Levee Analysis and Mapping Guidance* (2013). The new procedure — known as LAMP or Levee Analysis and Mapping Procedures — does not alter FEMA’s pre-existing levee accreditation standards. Instead, LAMP recognizes that non-accredited levees provide some measure of flood risk reduction and outlines the new process FEMA will use to map areas on the landward side of non-accreditable levees.

## “Levee Reach” Procedures

This new approach permits mapping by levee reach, rather than the entire levee system. A “levee reach” is defined as “any continuous length of a levee system to which a single technical procedure may be applied.” LAMP also created five new “technical procedures” for evaluating non-accreditable levees. (A detailed description of the new technical procedures is beyond the scope of this article, but they are called the Sound Reach Procedure, the Freeboard Deficient Reach Procedure, the Overtopping Procedure, the Structural-Based Inundation Procedure, and the Natural Valley Procedure). By enabling differential analyses for individual segments of a non-accredited levee system, LAMP enables more precise modeling and better map accuracy for levee systems that do not meet 100-year protection standards.

## Local Interaction

In addition to revising the technical manner in which FEMA considers non-accredited levees, the LAMP policy also attempts to ensure interaction between key stakeholders throughout the mapping and analysis process. One of the ways it facilitates interaction is through the creation of Local Levee Partnership Teams (LLPTs) to represent levee owners and impacted communities in discussions with



**Floodplains**

**Levee Analysis**

FEMA. These teams consist of local officials, subject matter experts, and other key stakeholders and are tasked with working with FEMA to decide how a particular levee will be divided into reaches, which technical approach will be applied to each reach, and making other data/funding decisions (such as explaining unique conditions, collecting existing local data, determining additional data that communities plan to submit, and developing a reasonable schedule to obtain input or other data).

As part of the levee analysis process, FEMA may not invest in data required for levee accreditation or in data to determine a levee’s structural condition. *Analysis and Mapping Procedures for Non-Accredited Levees – A New Approach* 1-9 (2013). Because appropriate analysis requires documentation of a levee’s condition (i.e., the structural stability, elevation of levee, and armoring), however, the LLPT takes on additional significance as an opportunity for impacted property owners to remind the levee’s owner (often the local jurisdiction or levee district) that it is their responsibility to produce this information. Using input from these LLPTs, FEMA makes its decision regarding the final approach for analyzing and mapping of non-accredited levees.

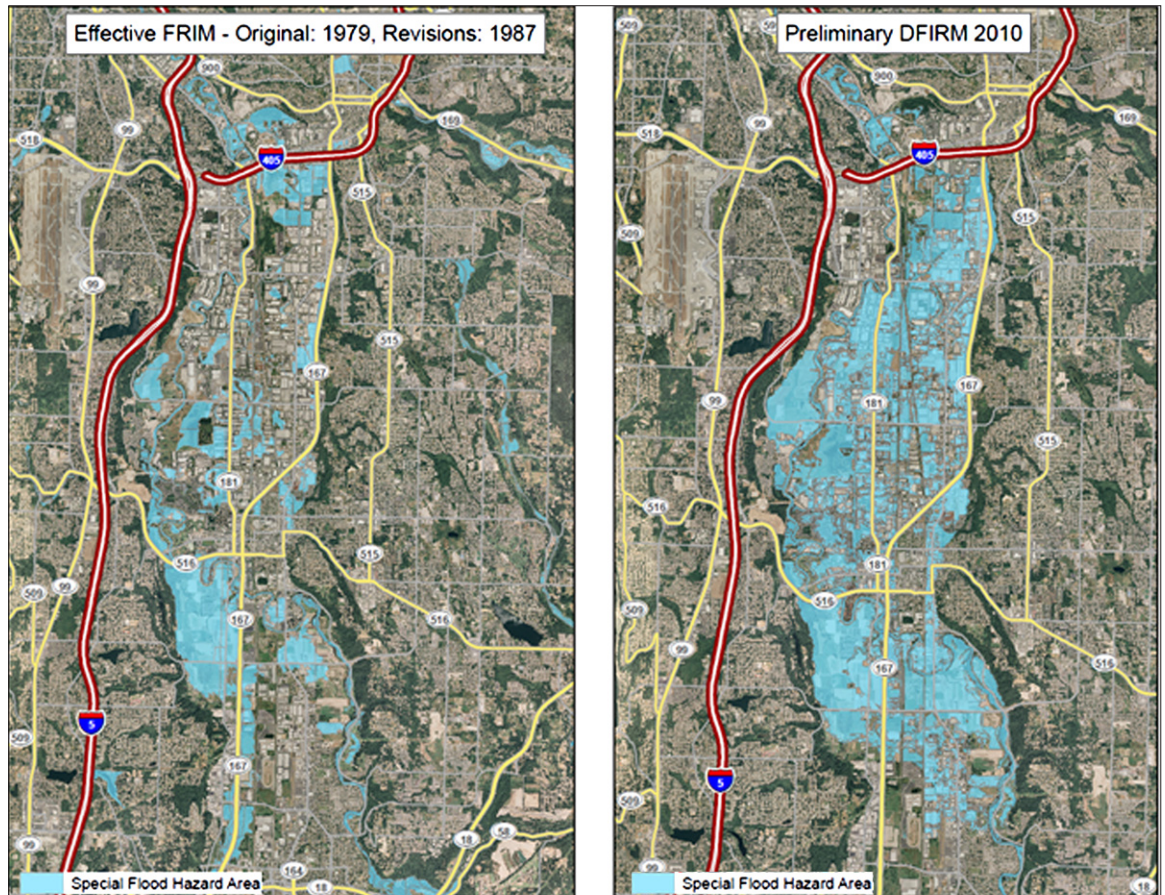
**Pilot Phase**

Although FEMA issued the new LAMP policy in mid-2013, updated floodplain maps using these new procedures are still several years from completion. FEMA began a pilot project applying LAMP to approximately 25 of the 280 flood studies, including non-accredited levee systems under review as part of the Map Mod process. The purpose of the pilot phase is to allow FEMA the opportunity to document trial applications of the new policy, refine the standards and guidance for implementation, and prepare educational and training materials for future communities that will need to apply the LAMP policy.

**Preliminary Maps**

FEMA anticipates that preliminary maps showing the results of these pilot studies will be available in 2017 with final effective maps sometime in 2018 (at the earliest). Between now and then, FEMA is moving forward with “sequestration” (at least in some regions) — a process whereby the floodplain maps for areas not affected by levees within a community may be issued independent from those that have been delayed by the levee mapping issues. While FEMA continues to work through these issues, numerous jurisdictions around the country remain in a state of limbo regarding their floodplain maps.

**“Without Levees” Mapping**



**A comparison of the maps for the Green River Valley south of Seattle.** On the left is from the 1990s and reflects FEMA assuming the levees met accreditation standards. The second is the DFIRM (digital rate map) produced by FEMA in 2010 without that assumption. Adapted from FEMA sources.

**MINIMUM FLOODPLAIN DEVELOPMENT STANDARDS TRIGGERED BY THE ESA**

**CHANGES TO FEMA’S IMPLEMENTATION**

The second major change to the implementation of the NFIP has resulted from the Program’s interface with the US Endangered Species Act (ESA), 16 U.S.C. §1531 et seq. ESA § 7(a)(2) provides in pertinent part: “Each Federal agency shall, in consultation with and with assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat of such species.” 16 U.S.C. § 1536(a)(2). This section imposes a procedural duty on an acting agency to consult with either the US Fish and Wildlife Service (USFWS) or NMFS if the action may affect a species listed as threatened or endangered (T/E species) or its critical habitat. 50 C.F.R. § 402.14(a). The responsibility for the administration and enforcement of the ESA lies with the Secretaries of Commerce and Interior, who have delegated the responsibility to NMFS with respect to marine species, and to USFWS with respect to terrestrial and freshwater species. 50 C.F.R. § 402.01(b).

Although the NFIP has been operating since the late 1960s, the Program has never completed a systematic review pursuant to the ESA regarding how it affects endangered species. Beginning in the 1990s, environmental groups around the country filed various suits against FEMA with the goal of forcing FEMA to consult with USFWS and/or NMFS regarding the impacts of the NFIP on T/E species (*E.g.*, *NWF v. Fugate*, No. 1:10-cv- 22300-KMM (S.D. Fl. July 13, 2010); *Wild Earth Guardians v. FEMA*, No. 01-0079-MCA/RLP (D. N.M. Sept. 14, 2009); *Coalition for a Sustainable Delta v. FEMA*, 711 F.Supp.2d 1152 (E.D.Cal. 2010); *Audubon Soc’y of Portland v. FEMA*, No. 3:09-cv-00729-HA (D. Or. June 25, 2009); *NWF v. FEMA*, 345 F.Supp.2d 1151 (W.D. Wash. 2004); *Forest Guardians v. FEMA*, No. 1:01-cv-00079-MCA-RLP (D. N.M. Jan. 22, 2001); *Florida Key Deer v. Stickney*, 864 F.Supp. 1222 (S.D. Fl. 1994)). After asserting unsuccessfully in two suits that it did not have adequate discretion under the NFIP to consider and implement the ESA, FEMA has ultimately conceded and entered into settlements in which it agreed to initiate consultations with USFWS and NMFS on potential impacts from the NFIP to T/E species and critical habitat. While these consultations have progressed to varying stages in different regions, the Pacific Northwest is continuing to serve as a “ground zero” for some of the most dramatic changes to the NFIP as a result of this litigation and resulting ESA consultations.

**LITIGATION & ESA CONSULTATION IN WASHINGTON**

**FEMA Ordered to Consult regarding the NFIP in Washington**

Following the theory of a similar suit in Florida in the 1990s (*Florida Key Deer v. Stickney*, 864 F.Supp. 1222 (S.D. Fl. 1994)), the National Wildlife Federation (NWF) and other environmental groups, filed suit against FEMA in 2003 alleging that FEMA failed to consult with NMFS regarding the impact of the NFIP on T&E salmon, steelhead, and killer whales. *NWF v. FEMA*, 345 F.Supp.2d 1151 (W.D. Wash. 2004). NMFS has jurisdiction over the Puget Sound Chinook salmon. Therefore, ESA § 7.2 imposes a procedural duty on FEMA to initiate formal consultation with NMFS if any action authorized, funded, or carried out by FEMA may affect Puget Sound Chinook salmon. In 2004, the U.S. District Court for the Western District of Washington agreed with the plaintiffs and concluded that FEMA had violated ESA § 7(a)(2) by failing to consult with NMFS regarding certain elements of the NFIP. In particular, the court ordered that FEMA undergo consultation regarding three of the NFIP programs: (1) the floodplain mapping program; (2) the minimum floodplain management criteria for community inclusion in the NFIP; and (3) the Community Rating System (CRS). The Court in *NWF v. FEMA* concluded that a fourth component of the program, the actual sale of flood insurance, is not a discretionary action within the meaning of the NFIP and ESA, so that program element was not evaluated in the consultation.

The endangered species considered in the consultation included Puget Sound Chinook salmon, Puget Sound steelhead, Hood Canal summer-run chum salmon, Lake Ozette sockeye salmon, and Southern Resident killer whales. Following significant, but unsuccessful, negotiations between FEMA and NMFS regarding the impact of these portions of the NFIP on T/E species and critical habitat in the Puget Sound region, NMFS issued a Biological Opinion (BiOp), which concluded that FEMA’s implementation of the NFIP in the Puget Sound region likely jeopardizes the continued existence of the listed species and adversely modifies their critical habitat. NMFS, *Endangered Species Act – Section 7 Consultation Final Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation* (2008). In particular, the BiOp concluded that by allowing individuals to remove their property from the floodplain artificially through fill, FEMA in effect encouraged filling in the floodplain and, causally, the destruction of salmon habitat. The BiOp also found that by providing an opportunity to avoid NFIP requirements if a property was landward of an accredited levee, the mapping program encouraged levee maintenance standards that negatively impact riparian vegetation and constrain channel migration, ultimately impairing habitat and protection for juvenile salmon.

**Floodplains**

**ESA Consultation**

**Systematic ESA Review Lacking**

**Lawsuits**

**FEMA Settlements to Consult**

**Failure to Consult**

**Involved Programs**

**NMFS BiOp (Jeopardy)**

**Floodplain Fill**

**Levee Issue**



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| <b>Floodplains</b>                            | <b>NMFS's RPAs and FEMA's Effort at Implementation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>"Reasonable &amp; Prudent Alternative"</b> | <p>As part of the BiOp, NMFS set forth a seven element "Reasonable and Prudent Alternative" (RPA) — NMFS's road map to FEMA for how to change its implementation of the NFIP to avoid jeopardy and adverse modification. The most substantive elements of the RPA suggested that FEMA significantly revise its flood mapping program (RPA Elements 2 and 5) and the minimum floodplain development criteria that each local jurisdiction must adopt to participate in the NFIP (RPA Element 3).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>NMFS' Suggested Changes</b>                | <p>Based on findings regarding the adverse effect of the floodplain mapping program, RPA Element 2 directed FEMA to implement changes to the program, including: (1) limiting approval of manmade floodplain alterations to those that avoid habitat functional changes or provide mitigation for the habitat changes that will occur as a result of the floodplain alteration; (2) prioritizing mapping activities based on the presence of sensitive salmon populations; (3) increasing the accuracy of floodplain modeling, including incorporating on-the-ground data; and (4) encouraging local jurisdictions to evaluate and identify the risk of flooding landward of 100-year levees based on anticipated future conditions, including climate change, and the cumulative effects of future land use changes. RPA Element 5 further ordered FEMA to stop recognizing levees certified by the Army Corps of Engineers using the Corps' vegetation maintenance standards unless it demonstrated that such vegetation standards would not adversely affect T/E species or their habitat.</p>                                                                                                                                                                                                                                                                                                                                                               |
| <b>FEMA Response</b>                          | <p>In response to RPA Elements 2 and 5, FEMA issued two procedural memorandums. Memorandum 63 mandates that applicants seeking levee accreditation demonstrate substantive ESA compliance, while Memorandum 64 addresses ESA compliance for map revisions based on other man-made changes to the floodplain. FEMA, however, declined to discontinue recognizing Army Corp certified levees, asserting that it lacks the authority to reject Corp certified levees, and claiming that Memorandum 63 should address NMFS's levee accreditation concerns.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Development Regulations</b>                | <p>RPA Element 3 has proved to be the most controversial element within the BiOp because it proposed to significantly change the development regulations applicable within all floodplains in the Puget Sound region. The BiOp concluded that FEMA's minimum floodplain development standards not only cause floodplain development that adversely affects listed species and their habitat, but also allow development without compensating for or addressing the resulting reduction of listed species habitat. As a result, RPA Element 3 proposed floodplain preservation through more stringent minimum floodplain management criteria. Specifically, RPA Element 3 directs FEMA to require local jurisdictions to modify their flood hazard development standards to prevent and/or minimize the degradation of channel and floodplain habitat. In short, the recommended changes to flood hazard standards include prohibiting development within the floodplain unless the applicant can demonstrate that the development will have "no adverse effect" on floodplain habitat or functions. This is a significant change from the previously existing NFIP minimum development standards, which focus on public safety and flood risk reduction, not T/E species and their habitats. (<i>See Id.</i> at Appendix 4 for a complete list of the recommended modifications to the NFIP minimum standards to achieve the "no adverse effect" standard).</p> |
| <b>Floodplain Habitat</b>                     | <p>In a novel approach, FEMA sought to implement RPA Element 3 by directing local jurisdictions to take one of three options: "Door 1" — adopt a FEMA-developed Model Ordinance that meets the ESA requirements identified in RPA Element 3; "Door 2" — demonstrate through a FEMA-approved checklist that the jurisdiction's current land use regulations already meet the requirements of RPA Element 3; or "Door 3" — demonstrate "no adverse effect" through permit-by-permit review of any new development proposed in the floodplain. FEMA has stated that all 122 NFIP participating jurisdictions in the Puget Sound region are now in compliance with RPA Element 3 because each has selected one of the three "Doors." As of March 2014, however, only five jurisdictions had adopted the Model Ordinance. Thirty six requested that FEMA approve their flood hazard regulations as BiOp compliant (Door 2), but to date FEMA has approved only 12. The remaining 81 jurisdictions opted for a permit-by-permit review (Door 3).</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>FEMA Options</b>                           | <p>While FEMA has sought to enforce RPA Element 3 against local jurisdictions, FEMA has not formally revised its minimum floodplain management criteria (44 C.F.R. § 60.3) to conform to the more stringent development regulations set forth in RPA Element 3. Instead, FEMA has asserted authority to enforce RPA Element 3 against local jurisdictions through existing 44 C.F.R. § 60.3(a)(2). This regulation provides that local communities participating in the NFIP must ensure that "all necessary permits have been received" before issuing a floodplain development permit.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Management Criteria</b>                    | <p>FEMA's efforts to leverage 44 C.F.R. §60.3(a)(2) to require local government compliance with RPA Element 3 is legally suspect. The only "permit" required under the ESA is a Section 10 Incidental Take Permit (ITP). However, ITPs are not required unless a project generates a "take." The BiOp and RPA Element 3 appear on their face to restrict many projects that fall far below the take threshold. Consequently, the validity of FEMA's approach to implementing RPA Element 3 is ripe for challenge by local governments and property owners.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>"Take" Provisions</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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| <b>Floodplains</b>                | <b>FEMA Sued A Second Time — This Time Over Implementation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Implementation Challenged</b>  | <p>In the fall of 2011, NWF again sued FEMA, this time asserting that FEMA had failed to implement the RPAs as written and consequently was continuing to jeopardize T/E species and their habitat. As part of the suit, NWF sought an injunction against the sale of flood insurance in the majority of Puget Sound jurisdictions and an injunction against map revisions pending complete BiOp implementation by FEMA. Sixteen Puget Sound cities, as well as Property Owners for Sensible Floodplain Regulations (a group representing private property interests), intervened. On April 12, 2012, Judge Ricardo Martinez, US District Court, Western District of Washington, denied NWF’s request, concluding that it had failed to demonstrate irreparable harm based on the way FEMA is currently implementing the NFIP in the Puget Sound region. <i>National Wildlife Federation v. FEMA, et al.</i>, No. C11-2044-RSM, Order Denying Plaintiff’s Motion of Preliminary Injunction (W.D. Wa. Apr. 12, 2012).</p> |
| <b>Litigation Positions</b>       | <p>This litigation highlighted fundamental differences in the parties’ understanding of the 2008 BiOp and the RPA’s “requirements.” NWF interpreted the RPA as very specific and directive, requiring FEMA to take steps to change its implementing regulations, to monitor the progress of local jurisdictions in their permitting activities, and to sanction those jurisdictions who do not strictly comply with the RPA. FEMA, by comparison, pointed to significant changes to its administration of the minimum floodplain management criteria, extensive modifications to the floodplain mapping program, as well as a number of procedural changes to incorporate ESA compliance into NFIP administration, as evidence of its implementation of the RPA. While NWF asserts that FEMA has not modified its implementation of the NFIP in accordance with the changes prescribed by the RPA, FEMA defends that it is faithfully executing all the tasks required by the RPA.</p>                                   |
| <b>Burden of Challenger</b>       | <p>On October 24, 2014, Judge Martinez issued his final order affirming the adequacy of FEMA’s implementation of the BiOp. <i>National Wildlife Federation v. FEMA, et al.</i>, No. C11-2044-RSM, Order Denying Plaintiff’s Motion for Summary Judgment and Granting Defendant FEMA’s Motion for Summary Judgment (W.D. Wa. Oct. 24, 2014), 2014 WL 5449859. In short, Judge Martinez concluded that where an action agency (here FEMA) does not fully implement the specific recommendations (in the form of an RPA) from a biological opinion, it is up the challenging party (here NWF) to demonstrate that the action agency’s substitute efforts are arbitrary and capricious, an abuse of discretion, or otherwise contrary to law. Judge Martinez concluded that NWF had <i>not</i> met this burden with regard to any of the seven elements of the RPA contained in the BiOp — at least not at this time.</p>                                                                                                    |
| <b>FEMA Victory: Implications</b> | <p>Judge Martinez’s decision is a significant victory for FEMA — and a great precedent for other action agencies attempting to implement biological opinions in the future. The implications of this decision for local governments and property owners/developers, however, are less clear. Judge Martinez appears to have shifted the obligation to implement the development restrictions contained in Element 3 of the RPA from FEMA to each of the 122 Puget Sound jurisdictions that participate in the NFIP.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>FEMA Authority</b>             | <p>OF PARTICULAR NOTE, JUDGE MARTINEZ WROTE:</p> <p>[A]s FEMA notes, it is not a land-use authority and it can only provide guidance, technical assistance, require reporting, and institute enforcement actions, which is what is required of it under the RPA. FEMA believes that it has done, and continues to do, what it can with the authority it has.</p> <p>The BiOp states that it is the local jurisdiction with permitting authority that must demonstrate to FEMA that any proposed development will not adversely affect protected habitat.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>ESA Scope Expanded</b>         | <p><i>Id.</i> at *11.</p> <p>The Judge went on to explain that where the local government fails in this duty, the BiOp sets up an elaborate multi-step process through which FEMA is to mitigate for any floodplain habitat impacts not addressed in the local permitting process.</p> <p>This appears to be a significant shift in the regulatory landscape. This decision appears to make the terms of a federal agency (FEMA) to federal agency (NMFS) ESA consultation and biological opinion directly applicable to local governments and local land use decisions absent any federal action or federal nexus. On its face, this expands the scope of the ESA beyond federal actions and designated critical habitat to purely local permitting decisions anywhere in the 100-year floodplain.</p>                                                                                                                                                                                                                  |
| <b>Flexibility Granted</b>        | <p>In making this ruling, Judge Martinez did grant local governments some flexibility. Although RPA Element 3, and particularly Appendix D to the NFIP BiOp, is written as a “one size fits all” set of development restrictions, the Judge acknowledged that each community’s existing environmental conditions vary and that the NFIP BiOp can only require Puget Sound communities to preserve existing floodplain and habitat functions, not create them where they do not exist. Further, the Judge criticized NMFS for creating an entirely new performance standard — the “no adverse effects” standard — that</p>                                                                                                                                                                                                                                                                                                                                                                                                |



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|---------------------------------|
| <b>Floodplains</b>              |
| <b>Compliance Determination</b> |
| <b>Local</b>                    |
| <b>FEMA Agreement</b>           |
| <b>Implementation Actions</b>   |
| <b>Incidental Take Permit</b>   |
| <b>Significant Overreach</b>    |
| <b>NMFS Response</b>            |
| <b>Draft BiOp</b>               |
| <b>Notice to Communities</b>    |

is neither drawn from the ESA nor well defined in the NFIP BiOp itself. (“It is the BiOp, not FEMA, that created the undefined ‘no adverse effects’ enforcement obligation.” *Id.* at \*12). In so doing, he acknowledged that each local government will not be required to implement the specific development restrictions outlined in RPA Element 3. Instead, Judge Martinez affirmed that each local community is best able to determine how to comply with the general standards (i.e., “no adverse effect”) outlined in the RPA within its boundaries.

It remains to be seen whether any party will appeal Judge Martinez’s decision to the 9th Circuit Court of Appeals, or equally important, whether this decision will change how either FEMA or the 122 NFIP participating jurisdictions in the Puget Sound region enforce or apply the NFIP BiOp and RPA to development in the region. Initial indications from FEMA’s regional staff are that it will continue (and perhaps increase) implementation efforts now that the Court has affirmed its approach.

**LITIGATION AND ESA CONSULTATION IN OREGON**

**Litigation and Settlement**

In a lawsuit substantially similar to the Washington case discussed above, conservation groups including NWF again filed suit against FEMA in 2009 in Oregon alleging that FEMA failed to consult with NMFS regarding the impact of NFIP implementation on T/E salmon and steelhead. *Audubon Soc’y of Portland*, No. 3:09-cv-00729-HA; *NWF*, 345 F.Supp.2d 1151. In July 2010, the parties settled the lawsuit with FEMA agreeing to initiate informal and formal consultation with NMFS on the impacts of the floodplain mapping program, minimum development standards, and the CRS program on T/E salmon and steelhead in Oregon.

FEMA began consultation with NMFS regarding the NFIP in Oregon in August of 2012. FEMA released a Programmatic Biological Assessment (PBA) in May of 2013 proposing a number of actions to change its implementation of the NFIP in Oregon to ensure a “not likely to adversely affect” determination. Many of the proposed measures mirrored changes to FEMA’s implementation of the NFIP in the Puget Sound region.

In an unprecedented step, FEMA also determined that its pre-PBA compliance monitoring program under 44 CFR Part 60.3 had been applied too narrowly by communities. Advancing a new interpretation of its regulations, FEMA stated, “if the potential of a ‘take’ exists for a proposed development permit within the SFHA, the community has a requirement under Part 60.3(a)(2) to ensure the ESA ‘permit for a take’ has been obtained from NMFS.” In other words, any action that has a potential for take (i.e. any disturbance or loss of floodplain habitat function affecting a listed species) would not be allowed under FEMA’s new interpretation of its regulations without a take authorization from NMFS through a Section 10 incidental take permit (ITP) or an incidental take statement. This new interpretation is a significant change — and overreach — from FEMA’s prior application of its regulations. It has the potential to chill, if not freeze, all development in the SFHA because almost any action taken within the zone could result in “potential” harm to T/E species or habitat, and obtaining a ITP is prohibitively time consuming and expensive for most development projects.

**Oregon Draft BiOp & Reasonable and Prudent Alternative (RPA)**

In September 2013, NMFS responded to FEMA’s PBA by providing a Preliminary Discussion Draft of a BiOp. This Draft Discussion concluded that FEMA’s proposed actions do not ensure against jeopardy to the continued existence of T/E species and do not ensure against the destruction or adverse modification of critical habitat designated or proposed for these species. NMFS expressed the belief that FEMA’s proposed changes to the implementation of the NFIP would not position FEMA to know or reliably estimate the general and particular effects of the NFIP on T/E species or designated critical habitat.

The draft Oregon BiOp sets forth a five-part RPA, which NMFS designed to remedy the perceived violation of the ESA (*see* NMFS, *Endangered Species Act (ESA) Section 7(a)(2) Draft Jeopardy and Adverse Modification of Critical Habitat Biological Opinion and Section 7(a)(2) “Not Likely to Adversely Affect” Determination for the Implementation of the National Flood Insurance Program in the State of Oregon*, pp. 253-276 (Sept. 5, 2014)).

The first element of the draft RPA would require FEMA to provide notice to all NFIP participating communities regarding the outcome of FEMA’s consultation on the implementation of the NFIP in Oregon. Specifically, FEMA would inform communities that its implementation of the NFIP in Oregon *does not ensure* that FEMA is not likely to jeopardize the continued existence of T/E species. Nor could FEMA ensure that its implementation of the NFIP in Oregon is not likely to result in the destruction or adverse modification of critical habitat for those species.

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| <b>Floodplains</b>                         | <p>The second element of the RPA would require FEMA to incorporate certain program standards and policies to guarantee that floodplain development under the Oregon NFIP avoided and minimized adverse effects on habitat functions and processes in basins occupied by T/E species or containing critical habitat. Moreover, NMFS would also require that FEMA’s revised standards and policies “adequately compensate for unavoidable adverse effects.” Ultimately, if FEMA chooses to adopt the RPA it would have to promulgate and issue revised regulations, policies, procedures, guidance, and protocols. Amongst the several changes proposed by the RPA, NMFS suggests that FEMA establish significant “conservation zones” (including the floodway, a riparian buffer zone extending 170 feet from the Ordinary High Water Mark (OHWM) of non-tidal surface waters and Mean Higher High Water (MHHW) of tidal waters) — where only very limited development would be permitted. Element two would affect FEMA’s floodplain mapping program, numerous provisions of its minimum development criteria, and the CRS program.</p>                                           |
| <b>Habitat Functions</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Conservation Zones</b>                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Minimum Management Criteria</b>         | <p>The third element would require FEMA to ensure that NFIP communities are compliant with minimum floodplain management criteria as revised under Element 2. Communities would be considered compliant if they foreclosed altogether development in the floodplain. In communities that continued to permit development in a floodplain, FEMA would be responsible for ensuring those communities codified revised minimum floodplain management criteria no later than 24 months from the date of the final opinion. Communities that failed to meet this deadline would be put on probation and ultimately could be suspended from the NFIP. FEMA would also be tasked with filing an annual report with NMFS providing status updates regarding efforts to implement the revised minimum floodplain management criteria and detailing the number of communities that had codified the criteria. Ultimately, Element 3 would require that FEMA ensure the achievement of adequate mitigation. FEMA would have to provide additional mitigation where local permitting decisions resulted in a “shortfall in habitat function.”</p>                                             |
| <b>Cumulative Impacts &amp; Mitigation</b> | <p>The fourth element provides specific criteria and practices to ensure that the negative effects of floodplain development do not aggregate over time. It would require that all adverse effects to ESA-listed species and habitat functions be mitigated and provides examples of suitable types of mitigation. Included in the list of acceptable mitigation methods are “creation of new or restoration of flood storage volume” and “creation of new or restoration of floodplain area[s].”</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Monitoring</b>                          | <p>Lastly, the fifth element of the draft RPA would require FEMA to systematically monitor all NFIP participating communities, to collect and report development information, and to use adaptive management to prevent further degradation when certain measurable performance standards are triggered. The fifth element also states that FEMA shall develop and require all participating communities to use a standardized form to report permit information and that FEMA should review these permitting reports for consistency with the other requirements of the BiOp.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>FEMA Response</b>                       | <p><b>Dispute between FEMA and NMFS over the RPA in the Oregon BiOp</b></p> <p>In late May 2014, FEMA responded to the NMFS draft BiOp and identified a number of issues with the RPA. FEMA posited that many sub-elements of the proposed RPA conflict with the statutory purpose and language of the NFIA, require actions outside of FEMA’s authority, and do not meet the statutory criteria for a “reasonable and prudent alternative” — i.e., they are not economically, technologically, or practically feasible. (<i>Letter from Roy E. Wright, Deputy Associate Administrator for Mitigation, Federal Insurance and Mitigation Administration, to Will Stelle, Regional Administrator, National Marine Fisheries Service, Northwest Region</i> (May 29, 2014)). For example, FEMA asserted that because the draft RPA would require the agency to develop state-specific regulations in Oregon, the RPA would require actions that violate FEMA’s statutory mandate to establish a unified national floodplain management program.</p>                                                                                                                                   |
| <b>Unified National Program</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Statutory Authority</b>                 | <p>In addition, regarding Element 2 — which suggests a general prohibition on development in the SFHA until “conservation zones” are identified and delineated — FEMA cited 42 U.S.C. § 4102 and explained that it allows FEMA to develop comprehensive criteria for NFIP community participation only when the Administrator deems the measure “necessary.” FEMA does not consider the conditional prohibition “necessary” to accomplish the goal of protecting private property and people from the consequences of flooding, and therefore considers this Element of the RPA to be beyond their statutory authority. Similarly, proposed RPA Element 5 would require FEMA to review floodplain development permits submitted to the participating communities for consistency with the RPA. In response, FEMA pointed out it is not a permitting agency and has no constitutional or statutory authority to insert itself into the local permitting process. Fundamentally, determining whether FEMA or the localities have the responsibility to ensure floodplain development conforms to ESA requirements has been the crux of the issue in both Washington and Oregon.</p> |
| <b>Local Permits</b>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Unresolved Conflicts</b>                | <p>As of the date this article, the conflicting understanding of FEMA’s abilities to remedy the NFIP’s purported non-compliance with ESA has not been resolved. Oregon federal, state, and local officials have become involved, responding that the draft RPA is infeasible for numerous reasons. As a result, NMFS has stated that it will revisit — and likely tailor — the RPAs. While NMFS would like to issue the Oregon BiOp “soon,” no date has been identified for issuance of the final version.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



**OTHER NFIP/ESA LITIGATION**

**Floodplains**

**Delta Smelt Cases**

Other consultations are now pending around the country. For example, the “Consolidated Delta Smelt Cases,” resulted in a 2012 settlement whereby FEMA agreed to request initiation of consultation, to release a biological assessment, and to notify communities about the settlement and consultation proceedings (*Coalition for a Sustainable Delta v. FEMA*, No. 1:09-cv-02024-LJO-BAM (E.D. Cal., Mar. 6, 2012)). Since the settlement, FEMA has engaged in early consultation with NMFS and the USFWS, conducting meetings to define an approach and to discuss which federally listed species would be included in a PBA on the effects of NFIP implementation in the Sacramento-San Joaquin River Delta. With the submittal of two PBAs on May 6, 2013, FEMA officially requested to initiate consultation for its implementation of the NFIP in the Sacramento-San Joaquin River Delta. The PBA analyzed the potential effects of NFIP implementation on federally listed species and their designated critical habitat. Based on both PBAs, FEMA determined that its implementation of NFIP’s discretionary actions was not likely to adversely affect listed species and/or designated critical habitat in the Delta. Both Services disagreed with FEMA’s initial finding, and the agency has been engaged in back-and-forth dialogue.

**Agency Dialogue**

**FEMA’S PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT REGARDING NFIP**

**Nationwide “PEIS”**

As part of the settlement of the Arizona ESA-consultation litigation, FEMA agreed to prepare a nationwide Programmatic Environmental Impact Statement (PEIS) regarding potential changes to the NFIP to address its impact on ESA-listed species and critical habitat. *WildEarth Guardians v. FEMA*, No. 10-CV-863-PHX-NVW (D. Az. Mar. 21, 2012). In May 2012, FEMA published a Noticed of Intent to initiate the PEIS process. At that point, FEMA tentatively indicated that the PEIS would consider the following alternatives: enhanced floodplain management standards including ESA; No Action; Discontinuance; Removal of subsidies; and a combination of the first and fourth alternatives.

**Changes Considered**

In April and May 2014, FEMA held a series of scoping meetings via webinar to inform the public regarding the status of the PEIS and solicit additional comments. Although FEMA has not yet identified the final alternatives that will be evaluated in the PEIS, all indications are that FEMA is considering significant changes to the Program to address its impact on the environment, particularly ESA-listed species and critical habitat. Consistent with the settlement agreement, the PEIS is to be completed by 2018 (although it is unclear whether FEMA is on track with this schedule).

**INCREASES IN FLOOD INSURANCE RATES**

**“True Flood Risk”**

The third area of significant change to the NFIP concerns the provision of flood insurance. In the past five years, Congress has enacted two statutes that have significantly affected the availability and rates of flood insurance coverage under the NFIP. The first, the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12), substantially reformed the NFIP. Recognizing that the Program was fiscally unsustainable (\$24 billion in debt following Hurricanes Katrina and Sandy), Congress proposed BW-12 as a solution to make the Program more financially sound, requiring the NFIP to raise rates to reflect “true flood risk” and change how FIRM updates impacted policyholders. (The discussion of both BW-12 and HFIAA here is limited to its effects on flood insurance policy rates. Each statute includes other provisions not summarized here related to mapping processes and protocols and other NFIP-issues).

**Actuarial Principles**

To ensure policies more accurately reflected flood risk, BW-12 required FEMA to use actuarial principles in determining premium rates — to create “full risk rates.” This sets rates adequate to cover Program obligations in a year with average historical losses, which includes years with catastrophic losses in the calculation of the average historical loss year (H.R. 4348, 112th Cong. (2011-2012), § 100211; Pub. Law 112-141). BW-12 also required FEMA to establish the National Flood Insurance Reserve Fund, equal to 1% (or a higher percentage determined by the Administrator) of the Program’s total potential loss exposure, to meet expected future claims or other obligations of the Program. *Id.* at § 100212.

**Reserve Fund**

BW-12 also eliminated subsidized flood insurance rates for nearly all structures except single family owner-occupied first homes. BW-12 began a four year phase in (25% increase per year beginning in 2013 through 2017) to reach full risk rates for all Pre-FIRM multifamily, commercial, and vacation properties (Pre-FIRM structures are those constructed before the date of the community’s first FIRM), and for “severe repetitive loss” properties. *Id.* at § 100205. Further, it immediately applied full risk rates to properties not insured as of the date of enactment of BW-12, properties with lapsed NFIP policies, and properties purchased after the date of enactment of BW-12.

**Subsidies Eliminated**

Finally, BW-12 eliminated grandfathering of many insurance rates. Prior to BW-12, property owners could purchase flood insurance for a property located outside of the floodplain or in a low risk area, and then retain that rate if the property was subsequently mapped into the floodplain or a higher risk area. BW-12 made flood insurance rates change concurrently with changes to the FIRMs, phased in at rate of 20% per year until rates reached full risk rates. *Id.* at § 100207. Collectively, these changes resulted in an immediate surge in rates for many policy-holders who had previously paid subsidized rates, and chilled sales of properties that had previously benefited from subsidized rates as potential purchasers faced immediate exponential rate increases.

**Grandfathering Change**

## Floodplains

### Public Outcry

### Mapping Coordination

### Advocate Established

### Other Changes

#### Molly Lawrence

counsels public and private clients in all facets of land use law. Her practice includes helping clients navigate divergent federal, state, and local requirements; drafting new and revised development regulations and development agreements; and advising clients through the legislative process. Molly has considerable experience permitting medium- and large-scale commercial projects and is adept at developing an overall strategy for taking a proposal from conception through construction. In addition, Molly regularly litigates zoning and permit-related appeals before local governments, the Washington Growth Management Hearings Board, and State court. In the last several years, Molly has focused her efforts on helping clients address ongoing changes in the regulations affecting development within floodplains.

These rate increases triggered public outcry. After the enactment of BW-12, the media began reporting stories of property owners facing 100-fold insurance rate increases (e.g., from \$400/yr to \$40,000/yr at the point of sale) leaving property owners unable to afford their properties. In response to this outcry, Congress enacted the second major NFIP reform bill, the Homeowner Flood Insurance Affordability Act of 2014 (HFIAA). H.R. 3370, 113th Cong. (2013-2014); Pub. Law 113-89.

HFIAA modified and repealed many provisions of BW-12. HFIAA repealed the section of BW-12 that triggered full actuarial rates at the point of property sale. Under HFIAA, a new purchaser may assume the prior owner's policy and retain the same rates. Refunds were to be dispersed to those who paid an increased premium as a result of the property being sold between the enactment of BW-12 (July 6, 2012) and enactment of HFIAA (March 21, 2014). HFIAA also repealed the provision of BW-12 that effectively eliminated FEMA's ability to grandfather properties into lower risk classes. For properties newly mapped into the floodplain, HFIAA sets the first year premiums at the same rate offered to properties located outside the SFHA (providing preferred risk policy rates), and (with limited exceptions) limited the premium increase to no more than 18% per year. Although HFIAA does not affect the rate increases on pre-FIRM vacation homes or commercial properties, the Act extended the time to full risk rates by capping annual premium increases at 18% for many other properties.

Additionally, HFIAA requires FEMA to enhance coordination with communities before and during mapping activities and requires FEMA to report certain information to members of Congress for each State and congressional district affected by preliminary maps. HFIAA also established a Flood Insurance Advocate within FEMA to advocate for fair treatment of NFIP policy-holders. The Flood Insurance Advocate is responsible for answering questions from current and prospective policy-holders about the mapping process and insurance rates. The Advocate will also educate property owners on individual flood risks, mitigation options and implications, and other elements of the NFIP (including helping policy holders understand the appeal procedure for preliminary FIRMs).

Finally, HFIAA removed the catastrophic loss years from the calculation of the average historical loss year; increased the Reserve Fund assessment; and imposes a new surcharge on all policy holders. Policies for primary residences incur a \$25 surcharge, while all other policies include a \$250 surcharge. The surcharges will expire when all pre-FIRM subsidies are eliminated.

Changes implemented through HFIAA addressed the most immediate and significant rate increases, but left in place the general policy for BW-12 of phasing in actuarially sound rates over a period of years.


### CONCLUSION

Based on these myriad changes to the NFIP, communities and property owners are seeing and will continue to see significant legal and practical limitations on the ability and desirability of developing in floodplains. In short, at the same time floodplains are getting larger, the development regulations and costs associated with owning and improving properties within the floodplain are increasing dramatically. While at first blush this may appear to be positive — moving people out of harm's way and improving habitat for various T/E species that utilize floodplains — the effect is in fact murky, particularly for industry that depends on shoreline locations (e.g., ports) and for areas that have already been developed based on prior understandings that they were at low or no risk for flooding. This will have significant implications for communities in the Pacific Northwest and around the country that have historically relied on areas as development centers that are now considered floodplain.


#### FOR ADDITIONAL INFORMATION:

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NATIONAL FLOOD INSURANCE PROGRAM WEBSITE: [www.floodsmart.gov/floodsmart/](http://www.floodsmart.gov/floodsmart/)



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WATER MANAGEMENT INNOVATION IN SAN FRANCISCO

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San Francisco Water

Infrastructure Importance

Repairs Needed

San Francisco Investments

Senate Testimony of Harlan Kelly
General Manager of the San Francisco Public Utilities Commission

Editors' Introduction: On December 2, 2014, the US Senate Subcommittee on Water and Wildlife held a hearing entitled, "Innovation and the Utilities of the Future: How Local Water Treatment Facilities are Leading the Way to Better Manage Wastewater and Water Supplies." This article presents the testimony of Harlan Kelly, General Manager of the San Francisco Public Utilities Commission, minimally edited to better fit The Water Report's format. In addition to providing information concerning his agency's innovative "Triple Bottom Line" decision-making process, Mr. Kelly's presentation coincides with a landmark agreement between San Francisco Bay area municipalities and water utilities concerning a regional groundwater storage project and the historic completion of a water delivery tunnel under San Francisco Bay. Supplemental information about these aspects of San Francisco Public Utilities Commission activities is also included.

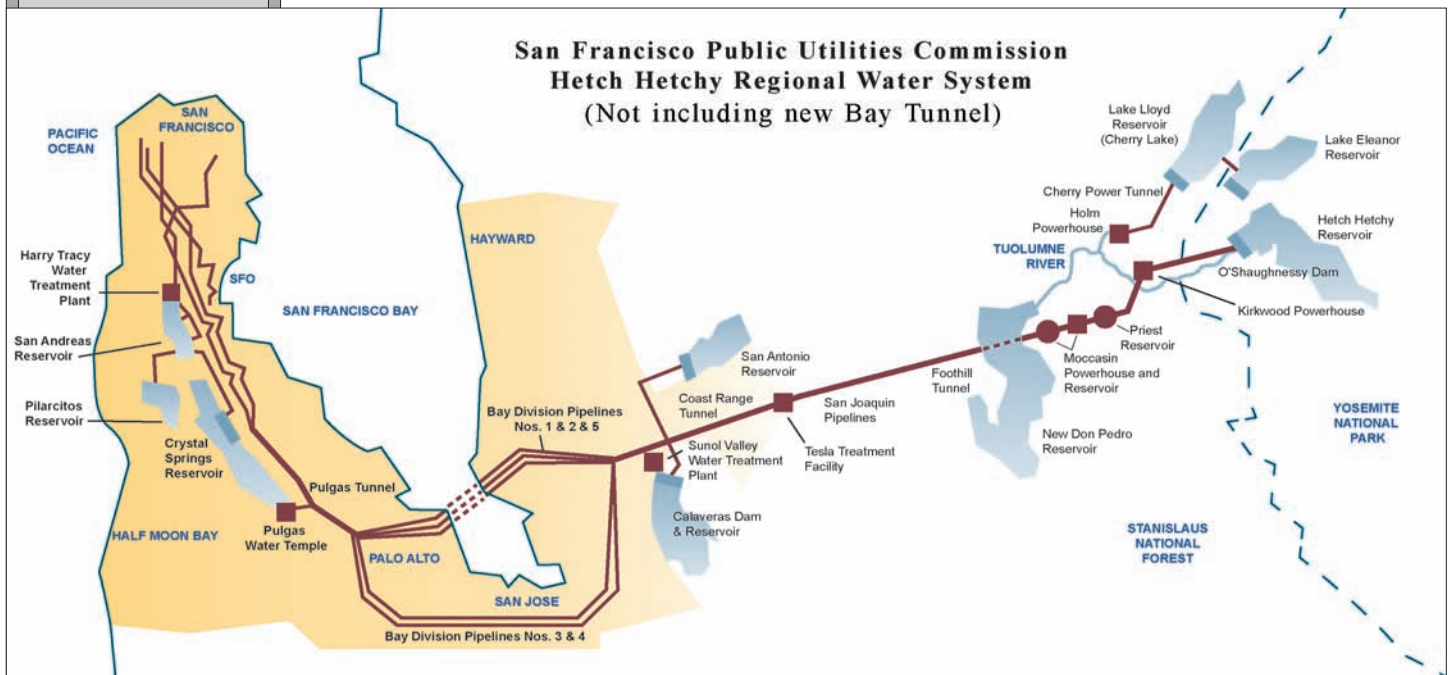
Information on accessing the other, highly informative, presentations given at the December 2 subcommittee hearing are provided following the article.

INTRODUCTION

Water and wastewater systems are the backbone of our cities and essential for growth, development, and economic prosperity. For over a century, utilities across the country have been putting people to work to construct, operate, and maintain the water and wastewater infrastructure that we rely on daily. Since its earliest days, water has been vital to the growth and prosperity of the Bay Area. From Silicon Valley to San Francisco, the Bay Area's rich regional history and thriving economy were made possible by building reliable water and wastewater infrastructure.

Water agencies across the country have been working tirelessly to maintain high quality and reliable service while preserving affordable rates. Yet, nationwide water and wastewater infrastructure is in dire need of repair. In 2013, the American Society of Civil Engineers gave drinking water and wastewater systems a D grade, on average. The 1.7 trillion gallons of treated water per year we are losing from our aging and failing water distribution systems is costing us \$2.6 billion annually. The United States Conference of Mayors estimates that \$4.8 trillion in capital investment will be needed over the next 20 years to bring our water and wastewater systems to a state of good repair and maintain current levels of service.

Local utilities are reinvesting. In San Francisco, that has meant a nearly \$5 billion investment in our drinking water system and a needed investment of \$6.9 billion in our wastewater system. We have seen firsthand how our investments make San Francisco a more viable place to work and live. These investments are not only improving our water infrastructure, but are also creating a positive ripple effect throughout the regional economy.



**San Francisco Water**

**Nationwide Investments**

**Innovation Embraced**

**Regional System**

**Hydroelectric & Solar**

**Wastewater**

**Aging System**

**Redundancy & Seismic Reliability**

**Capital Plan**

San Francisco is not alone. According to the report *National Economic and Labor Impacts of the Water Utility Sector*, published by the Water Research Foundation and Water Environment Research Foundation (September, 2014), 30 of the largest public water and wastewater agencies will be investing \$233 billion through operational and capital spending over the next decade. These investments will generate over half a trillion dollars in economic output over the next ten years and support 289,000 jobs annually. With our investments, we have the opportunity and the responsibility to think about how we can maximize our returns.

After decades of working on large infrastructure projects, I have seen firsthand how investments in water and wastewater infrastructure can present opportunities to create jobs, grow the economy, address broader city challenges, and improve communities. As general manager of the San Francisco Public Utilities Commission (SFPUC), I have watched our industry transform over recent years and embrace innovative approaches. The 2013 report from the National Association of Clean Water Agencies (NACWA), *Water Resources Utility of the Future...A Call for Federal Action*, is indication that our field is moving in a new direction, one that SFPUC embraces. Utilities across the nation are pushing past traditional mandates of service delivery to integrate innovative technologies, partnerships, and business approaches of the 21st century.

As general manager, it is my priority that we have 21st century infrastructure to support a 21st century city. This testimony will share how we are investing in our infrastructure in a way that: integrates new technologies; addresses climate change concerns; and provides benefits to the community — all while optimizing our core mandate of providing efficient, high-quality water and wastewater services to the people of the San Francisco Bay Area.

**THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION**

SFPUC is a department of the City and County of San Francisco that provides retail drinking water and wastewater services to San Francisco, wholesale water to three Bay Area counties, and green hydroelectric and solar power to San Francisco’s municipal departments. We are the third largest public utility in California, with 2,300 employees working in seven California counties, and a combined operating budget of nearly \$1 billion.

Our regional water system traverses over 167 miles and over three active fault lines to deliver 265 million gallons of pristine, high-quality water per day from the Sierras to 2.6 million residents and businesses in San Francisco, San Mateo, Santa Clara, and Alameda counties. A collateral benefit of this gravity-driven system is that it generates over 400 megawatts of hydroelectric power along the way. Combined with our in-city solar arrays and biogas energy generation, our power enterprise generates 1.7 billion kilowatt hours (equivalent to the annual power usage of 350,000 San Francisco homes) of clean renewable energy for San Francisco public schools, fire and police stations, and other municipal customers. On the wastewater side, we operate and maintain San Francisco’s combined sewer system, which collects and treats sanitary flows and stormwater run-off to protect public health, the environment, and the San Francisco Bay and Pacific Ocean. This expansive network includes 1,000 miles of sewers, tunnels, and transport/storage boxes that carry flows to one of our three treatment facilities, where we treat an average of 83 million gallons of wastewater per day, and up to 575 million gallons per day during storms.

**System Challenges and Vulnerabilities**

Like other utilities across the nation, our infrastructure systems face critical challenges. Our systems are aging. On the sewer side, 130 miles of our system is over 100 years old and 60% of the system is over 70 years old. Our largest wastewater treatment plant, which treats 80% of the city’s flow, still relies on 1940s technology. While we conduct video inspections on 150 miles and replace 15 miles of sewers annually, we are beginning to experience additional failures to our pipes and treatment plants that threaten service reliability. Last year alone we experienced around 100 water main breaks in San Francisco. In many cases, water or sewer main breaks or emergency failures have substantial impacts on residences, businesses, transportation routes, and the tourism industry. We cannot afford to allow incidents like this to continue to occur in our communities.

In the Bay Area, we also have to consider issues of redundancy and seismic reliability. According to a US Geological Survey study, there is a 63% chance our city will face a 6.7 or larger quake in the next 30 years. See, USGS, 2008. *The Uniform California Earthquake Rupture Forecast, Version 2*. A major earthquake could cause catastrophic failure to both the water and wastewater systems and could cause service interruption for water delivery for up to two months — which is why seismic upgrades are a significant part of our capital improvement programs.

**Our Capital Programs**

To ensure our systems continue to provide essential services for future generations, we are undertaking significant improvements to our water and wastewater infrastructure. Our capital programs are driven by a 10-year capital plan, which outlines approximately \$10 billion in fiscal needs and takes into consideration infrastructure demands, sustainability, and ratepayer affordability.



**San Francisco Water**

**Water System Improvements**

**Employment Gains**

**Sewer Improvements**

**Stormwater Projects**

**Integrated Approach**

**Core Priorities**

**Watershed-Based Planning**

We currently have two capital programs underway: the Water System Improvement Program and the Sewer System Improvement Program. In developing these capital programs, we established levels of service goals that address the deficiencies in the current systems and foreseeable future challenges, and ensure that SFPUC continues to meet our core mission. All projects within the two capital programs are developed and selected to fulfill these benchmarks. This process compliments our results-driven approach to establish specific, measurable goals and objectives that guide project selection and implementation, and measure success.

**Water System Improvement Program**

In 2004, SFPUC launched the Water System Improvement Program (WSIP), a capital program to improve the water system’s reliability and seismic safety. Now over 80% complete, this nearly \$5 billion program is one of the largest infrastructure programs in the country, consisting of 82 projects across seven counties. The most notable WSIP projects include: the first tunnel under the San Francisco Bay; the second largest ultra-violet treatment facility in California; and a seismic upgrade project that will create a new pipeline crossing the Hayward fault — Bay Division Pipeline No. 3 — with the ability to absorb up to 6.5 feet of movement should an earthquake occur.

The program has been an excellent avenue to expand employment and small business opportunities across our service territory. To date, this rebuild has generated 11,000 jobs and over 7 million craft hours since 2007. De-bundling contracts for the program allowed contracting opportunities to reach a broader group of local contractors in our service territory. In 2007, we adopted a Project Labor Agreement to cover all WSIP projects of \$5 million or greater. The agreement binds projects to: California prevailing wages; local workforce hiring; apprenticeship training; and other labor practices that benefit both the program and workers.

**Sewer System Improvement Program**

Building on the success of the WSIP, in 2011, we embarked on a 20-year, multi-billion dollar Sewer System Improvement Program (SSIP) that will bring our sewer infrastructure to a state of good repair through a phased-approach. Our commission validated a \$6.9 billion need and approved \$2.7 billion for Phase 1, mission-critical projects, including vital repairs at the Southeast Treatment Plant, which is located in one of San Francisco’s most disadvantaged neighborhoods — Bayview Hunters Point. The repairs will modernize treatment facilities, transform our campus into a community asset, and address community impacts such as odors. The SSIP presents a historic, once-in-a-generation opportunity to utilize a large-scale infrastructure program to reinvest in the community through contracting, procurement, and local employment opportunities.

Phase 1 of the SSIP also includes \$57 million for eight large-scale stormwater management demonstration projects that will utilize and evaluate green infrastructure technologies, and determine lifecycle costs and standards to pave the way for future green infrastructure implementation. Based on these assessments, up to \$350 million is designated for additional green infrastructure projects in future phases of the SSIP.

As we build the infrastructure of the future, we are also integrating new technologies, initiatives, and business strategies that make us a utility of the future. The SSIP is an opportunity to embed new innovations into our work and set an example for the nation in areas of: climate resiliency; resource recovery; integrated planning; and community benefits.

**STORMWATER PLANNING**

**INTEGRATED WATERSHED-BASED APPROACH USING TRIPLE BOTTOM LINE**

The US Environmental Protection Agency (EPA) promotes an “*Integrated Municipal Stormwater and Wastewater Planning Approach Framework*” to help local governments meet consent decrees and federal Clean Water Act water quality objectives. This approach also helps prioritize capital investments. The framework is a means to maintain regulatory standards in a cost effective manner while considering sustainable technologies, community impacts, and affordability. *See* [water.epa.gov/polwaste/npdes/stormwater/Integrated-Municipal-Stormwater-and-Wastewater-Plans.cfm](http://water.epa.gov/polwaste/npdes/stormwater/Integrated-Municipal-Stormwater-and-Wastewater-Plans.cfm)

While SFPUC is currently in full regulatory compliance, this is a principle that we have long integrated into our planning efforts. As we plan and prioritize our capital programs, we evaluate projects based on our core priorities: 1) delivery of high-quality, reliable 24/7 services; 2) maintenance of our infrastructure; and 3) ratepayer affordability.

As we developed the SSIP, we wanted to institutionalize our integrated approach to planning on the front end. The Urban Watershed Assessment (UWA) is SFPUC’s most innovative and comprehensive planning effort to date and is a critical part of the SSIP. UWA uses a watershed approach to planning to develop a long-term plan for our collection system by assessing: seismic reliability; stormwater management; odor reduction; water quality protection; flood reduction; and the effects of climate change on rainfall, sea level rise, and storm surges.

**San Francisco Water**

**“Triple Bottom Line” Assessment**

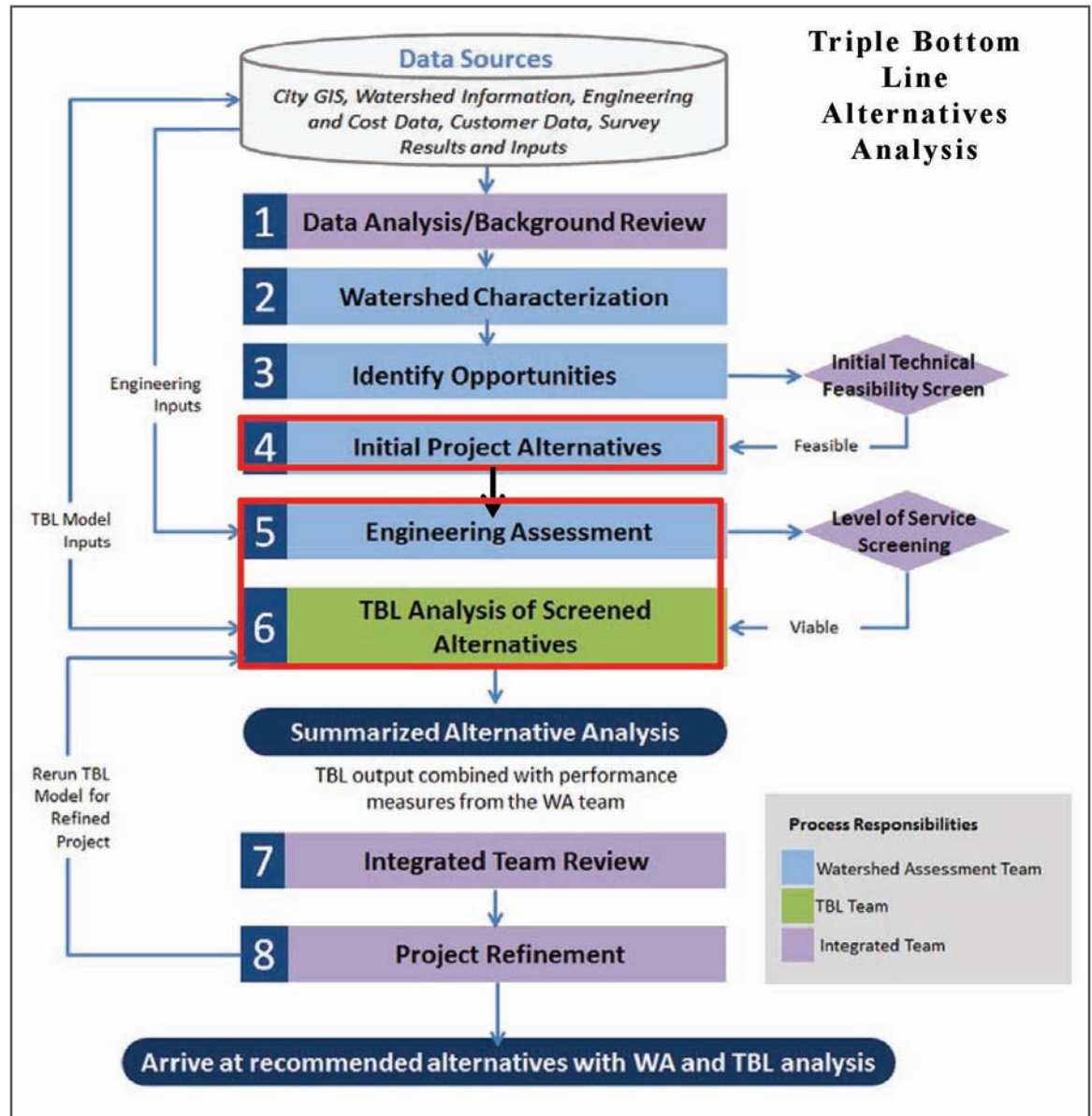
**Green Infrastructure**

**“TBL” Assessment Process**

Our city is divided by a natural ridge that runs north and south and splits our drainage areas into eight urban watersheds. The UWA process begins with a needs assessment that spatially depicts the features of our watersheds by looking at elements such as: soil composition; flood areas; rainfall runoff; and lack of system redundancy. This process informs prioritizing projects in areas where needs are the greatest. There are many alternative solutions to addressing the challenges in each watershed, and potential projects could include any combination of grey and green infrastructure. Each alternative is evaluated based on its fulfillment of the SSIP levels of service goals and our Triple Bottom Line (TBL) assessment, which considers and evaluates: 1) financial; 2) environmental; and 3) social aspects.

The TBL assessment model, developed specifically for our agency, balances the values and priorities of SFPUC including: engineering performance; financial costs; and environmental and social benefits. The model includes 19 indicators for evaluation, such as: odor; noise; construction impacts; lifecycle costs; climate change resiliency; and habitat — the logic for these indicators is based on specific city policy standards. The tool helps us weigh our alternatives and allows for flexible and transparent decision making.

Based on the information collected through our assessments, we are developing a tailored suite of projects that will address the challenges specific to each watershed. Using this method of integrated planning for stormwater management we can make informed and economical decisions about how to improve the performance of our system through grey and green approaches. The UWA helps us maximize green infrastructure solutions where they make sense and build them in a way that also maximizes the economic, environmental, and social benefits provided.



**San Francisco Water TBL Criteria**

**Innovative Public Engagement**

**Water/Energy Nexus**

**Energy Efficiency**

**Grease to Biofuel**

**Methane Potential**

| TBL EVALUATION CRITERIA |                                                                                                                                                               |                                                                                                                                                                                        |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Financial</b>        | 1. Life-Cycle Costs<br>2. Good Governance<br>3. Cost Sharing/Collaboration                                                                                    |                                                                                                                                                                                        |
| <b>Social</b>           | 1. Reduced Flooding damage<br>2. Local Employment Gains<br>3. Recreation Improvements/Community Amenities/Property Value Changes (+)<br>4. Reduction in Odors | 5. Protect of / Improvement in Public Health<br>6. Increased Education<br>7. Interruption in Traffic<br>8. Hazard Mitigation/Improved Public/Pedestrian Safety<br>9. Cost to Ratepayer |
| <b>Environmental</b>    | 1. GHG Reduction<br>2. Reduction in Combined Sewer Discharge<br>3. Habitat Enhancement/Improvement in Water Quality<br>4. Limit Soil Erosion                  | 5. Adaptive Capacity for Climate Change<br>6. Recharge Aquifers<br>7. Avoided Water Consumption<br>8. Construction Related Pollution (-)                                               |

One of the most innovative ways we have conducted this integrated planning is by employing unique and creative public engagement strategies. From 2007 to 2009 and again in 2013 and 2014, we hosted “Urban Watershed Planning Games” to engage the larger community in creating a vision for what stormwater management could look like in San Francisco’s future. Participants contributed their input and generated ideas for green and grey solutions to address specific watershed challenges through an interactive, award winning game. In addition to the game, input was gathered via MetroQuest, a customized online survey software, and various social media platforms including Twitter, Instagram, and Facebook. By making this an inclusive process, we were able to further integrate the values and inputs of community members and stakeholders into the rebuild of our sewer system.

**EXPANDING RESOURCE RECOVERY AT WASTEWATER TREATMENT PLANTS**

Water and energy are inextricably tied together. As has been noted by EPA, pumping, treating, transporting, and distributing water and wastewater requires a great deal of energy, with treatment systems typically accounting for 30-40% of municipal government energy usage. *See EPA (March, 2008) Water and Energy: Leveraging Voluntary Programs to Save Both Water and Energy (viii)*. The average amount of energy used to treat one million gallons of wastewater is 1,200 kilowatt-hours. *See EPA (January, 2009) Clean Energy Opportunities in Water and Wastewater Treatment Facilities*. Energy efficiency improvements at water and wastewater treatment facilities have high rates of return, and can significantly reduce facility costs. In addition to making efficiency improvements, EPA recognizes a great opportunity for utilities to reduce their carbon footprint by recovering resources at wastewater treatment plants. For SFPUC, this means finding ways to generate energy through our treatment process and our innovative fats, oils, and grease program.

**SF Greasecycle**

SFPUC’s biofuel program — “SF Greasecycle” — is a successful resource recovery program. The program collects fats, oils, and grease (FOG) throughout the city and treats it to be used for biofuel generation. FOG traditionally causes clogging and malfunctions in the sewer collection system, costing the city millions of dollars each year. To date, more than one million gallons of used cooking oil have been collected from eight residential drop-off points and over 1,000 restaurants. After removal of impurities (food scraps and water) and primary polishing, SFPUC sells the grease byproduct to be converted into biodiesel. The biofuel can then be sold to city transit fleets, with the potential to replace over 250,000 gallons of petroleum diesel each year.

**Biogas to Energy Programs**

In San Francisco, methane gas currently produced during the wastewater treatment process at our Southeast Treatment Plant has the potential to meet up to 40% of the plant’s energy needs. Unfortunately, at this time our plants do not have the technology or capacity to convert all biogas to energy, and excess is burned off in waste flares. With the SSIP, SFPUC is well poised to take advantage of groundbreaking technologies to increase energy extraction and improve resource recovery capacity at our wastewater treatment plants.



## San Francisco Water

### Biogas Production

### Biomethane Pilot Project

As we upgrade our treatment plants, we are embarking on two projects that will improve biogas production and the biogas-to-energy conversion process. A \$1.2 billion biosolids project at the Southeast Treatment Plant will update this important facility to produce enough biogas to generate 7 MW of power, increasing on-site energy generation to 87.5% of the plant's needs. At the Oceanside Treatment Plant, we are investing \$48 million in a gas utilization project that will replace the existing biogas handling and power cogeneration process equipment with new systems that will reliably increase existing peak energy production capacity at the plant by over 150%. Collectively, these improvements will: produce over 9 MW of renewable energy; improve our ability to capture and convert energy for useful purposes; eliminate the need to burn excess biogas; reduce energy costs and greenhouse gas emissions; provide ratepayer savings; and improve air quality in the surrounding neighborhoods.

SFPUC is also exploring options for a biomethane generation demonstration facility pilot project at the Southeast Treatment Plant. Biomethane generation at wastewater treatment plants could potentially be a source of significant generation of renewable energy. However, additional information is needed to assess the feasibility of this sort of activity on-site at local treatment plants. A biomethane generation demonstration project would give SFPUC — and the broader utility industry — more precise data on the feasibility of large-scale biomethane generation. If successful, it could lead to significant investment in the generation of renewable energy.

## BUILDING RESILIENT SYSTEMS IN THE FACE OF CLIMATE CHANGE

### Adaptation Strategies

As an agency responsible for vital natural resources, we are on the front lines of environmental protection. From droughts that threaten water supplies, to super storms that cripple sewer systems, we are already seeing the adverse effects of climate change across the country. Preparing our communities and infrastructure systems to be resilient against climate change is one of the biggest challenges our cities faces. SFPUC is working to integrate climate change adaptation strategies into the rebuild of our sewer system.

### Climate Change Adaptation Planning Framework

### Climate Change Planning Framework

As we implement the SSIP, it is important that we have precise data on the impact of rising sea levels, storm surges, rainfall patterns, and temperature variations on our system to inform engineering and design. To do this, we are employing an Adaptation Planning Framework to guide our agency through risk analysis and adaptation implementation. Using scientific studies and scenarios, the framework assesses the vulnerability of our assets (exposure, sensitivity, and resiliency), the likelihood of climate risks, and consequences of inaction to develop adaptation plans. As we implement these adaptation measures, we are constantly monitoring our adaptive capacity and are ready to make adjustments as new information becomes available.

### Design Standard Revisions for Storm Intensity

### Intense Storm Planning

Climate scientists have long warned that weather events will increase in intensity in the future, but quantifying these predictions has proven very difficult. For example, in San Francisco we experienced: three 5-year storms (two of which were in the same year); one 10-year storm; and one 25-year storm — all in just over a five year period. Few, if any, municipalities have revised design standards that accommodate changes to the return rate of storms or their intensity. As part of the SSIP, we are undertaking a survey of the latest projection data emerging from the *Intergovernmental Panel on Climate Change's Fifth Assessment Report* (2013) to determine how we can make changes to the Intensity-Duration-Frequency curves that we currently use for rainfall predictions.

### Sea Level Rise Inundation Mapping

### Saltwater Intrusion Guidelines

We are already experiencing saltwater intrusion into our sewer system during storm surges, which causes significant challenges to our wastewater treatment process and harms our facilities. With sea levels predicted to rise 11 inches by 2050 and 36 inches by 2100, we are developing seal level rise inundation maps for all three of our shorelines. These maps will help with broader city-wide planning efforts to address sea level rise challenges through capital planning. Our inter-agency Sea Level Rise Committee is developing guidelines that will ensure future capital projects undertaken by city departments are resilient to projected effects of sea level rise. These guidelines are a first of their kind at the local level and demonstrate how we can incorporate uncertainty into our planning efforts — a further example of how San Francisco and SFPUC are providing leadership in areas of national concern.

In San Francisco, we recognize our vulnerability as a coastal city, and SFPUC has stepped up to ensure our systems are sustainable, resilient, and will meet the needs of a changing environment through our capital programs.



**Bay Area Groundwater Storage Project**

On December 16, 2014, a landmark agreement between the San Francisco Public Utilities Commission (SFPUC) and three San Mateo County organizations was finalized and signed. The agreement is intended to ensure long-term management and sustainability of the South Westside Groundwater Basin. The basin, which stretches from San Francisco to Burlingame, has the capacity to store 20 billion gallons of groundwater in a regional water “savings account” to protect against future drought and earthquake.

The \$113 million Regional Groundwater Storage and Recovery Project is a partnership between the SFPUC, City of Daly City, City of San Bruno and California Water Service Company. During years of normal or heavy rainfall, the project will provide additional surface water to the partner agencies in San Mateo County in order to reduce the amount of groundwater pumped from the South Westside Groundwater Basin. Over time, the reduced pumping will create a groundwater savings account of up to 60,500 acre-feet of water (20 billion gallons) — a volume equivalent to that of the SFPUC’s existing Crystal Springs Reservoir.

The project is needed to meet dry year water supply needs. Without the project, regional water utilities would need to increase mandatory rationing above currently projected levels. The concept of groundwater storage and recovery — also known as “conjunctive water management” — consists of

storing water in wet years and recovering that water for use during dry years. As part of this proposed project, surface water will be used instead of groundwater in wet years. This will create a savings account of groundwater stored in the aquifer by allowing it to recharge through rainfall and decreased pumping. In dry years, when less surface water is available, the saved water will be pumped from the new groundwater well recovery facilities.

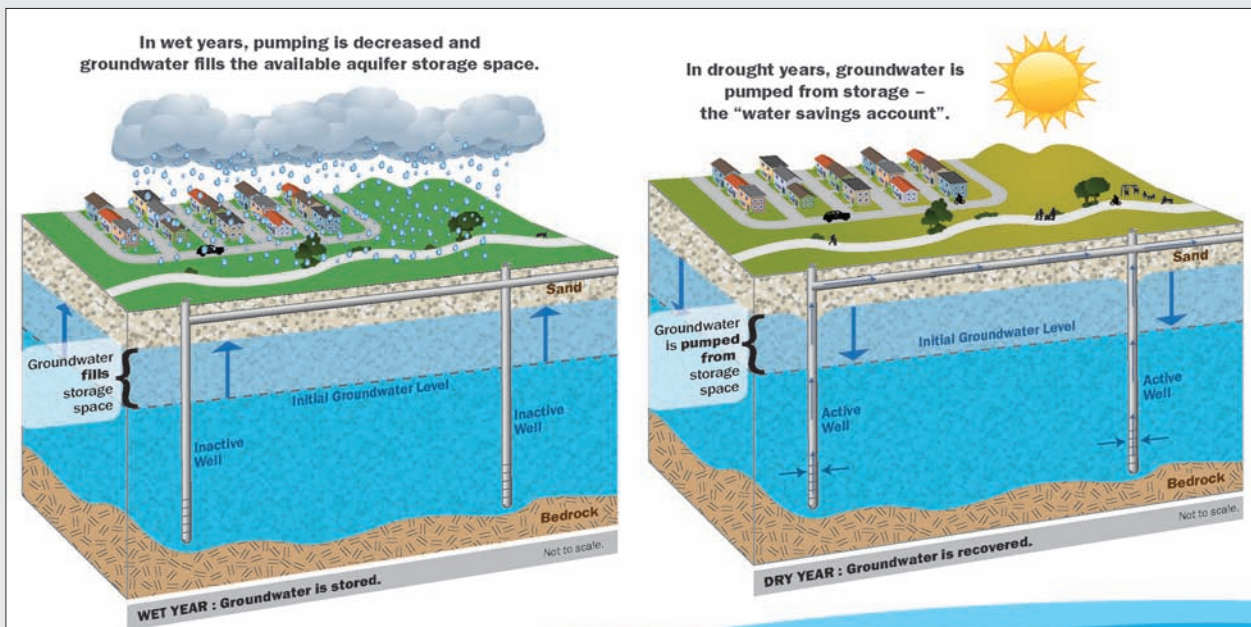
Project water savings account will also be available during emergency situations such as an earthquake. During years of normal or heavy rainfall, the project will provide additional surface water to the partner agencies in San Mateo County in order to reduce the amount of groundwater pumped from the South Westside Groundwater Basin. The water will be stored underground in the South Westside Groundwater Basin aquifer in San Mateo County.

The partner San Mateo County agencies currently provide drinking water from two sources, local groundwater from the South Westside Groundwater Basin and surface water supplies from the Hetch Hetchy Regional Water System.

The groundwater supply project has completed environmental review and is moving forward to construction in 2015. Once completed in 2018, this project, through 16 new recovery wells, stations, pumps and pipelines constructed in the Peninsula will provide 7.2 million gallons of water per day for the 2.6 million people in the Bay Area who rely on the Hetch Hetchy Regional Water System.

Within the City of San Francisco, the SFPUC is starting construction on the San Francisco Groundwater Supply Project to diversify the City’s local water supply portfolio. This project will provide up to four million gallons of local, sustainable groundwater every day.

**For info:** Updates and additional information on the Regional Groundwater Storage and Recovery and San Francisco Groundwater Supply Projects are available online at: <http://sfwater.org/groundwater>.



**San Francisco  
Water**

**Income  
Inequality**

**“Good  
Neighbor”  
Policy**

**Environmental  
Justice**

**Workforce  
Strategies**

**BEING A GOOD NEIGHBOR**

As one of the largest city agencies in terms of revenues, contracts awarded, and land owned, SFPUC has a major economic impact in our city.

Providing benefits to the community is especially important in a city like San Francisco, where prosperity and poverty coexist. In many ways, San Francisco is experiencing a period of incredible growth and prosperity as vast numbers of people and businesses are moving into the city. The City has a low 4.3% unemployment rate, and median home prices have increased 15.5% year to year. At the same time, the gap between the average household income of wealthy residents and that of poor ones has grown wider and faster in San Francisco than any other city in the country.

We have an opportunity to leverage our capital dollars to provide community benefits as we bring our infrastructure to a state of good repair, and have been able to accomplish this through our landmark “good neighbor policies.” The SFPUC was the first public utility in the nation to proactively adopt an Environmental Justice Policy (2009) and Community Benefits Policy (2011) that guide the agency to be a good neighbor and positively impact the communities that are affected by our operations. But in order to be successful, these can’t be stand-alone policies — this way of doing business has to be integrated into all aspects of the organization.

To help SFPUC operationalize these policies, we started a community benefits program through which we are investing in career pathways for adults and youth, education initiatives to educate the next generation of environmental stewards, and more.

**Environmental Justice**

Our environmental justice policy directs SFPUC to integrate environmental justice principles into all business decisions that affect the agency’s core operations, programs, and policies. For example, as part of our urban watershed assessment to inform sewer system planning, we identified particular environmental justice areas of concern and incorporated metrics that allowed us to assess if our public outreach efforts were adequately engaging residents in neighborhoods of concern. Furthermore, the process also highlighted considerations for SFPUC project managers at each relevant step of the assessment to analyze potential social, health, and economic impacts of various projects, with a special focus on more beneficial alternatives or redesigns.

**Workforce Development**

With nearly one-third of the water sector workforce and 25% of SFPUC employees currently eligible to retire, workforce development is a major issue for our agency. As one of the City’s largest employers, we have a role to play and a vested interest in building a skilled workforce that meets the future needs of our city. We are committed to supporting and initiating successful workforce investment strategies that create a career pipeline for our future workforce. Internally, we have a 9910 stationary engineer apprenticeship program for individuals from underserved communities. So far 100% of participants have secured employment opportunities after completing the program. In addition, every summer we support over 1,000 youth interns working with SFPUC, with over half of them producing final service learning projects tied to SFPUC issues.

**New San Francisco Bay Water Delivery Tunnel**

On October 15, 2014, the San Francisco Public Utilities Commission (SFPUC) joined with Dave Pine, President of the San Mateo County Board of Supervisors, to celebrate the completion of the first tunnel under San Francisco Bay at the location where the first Hetch Hetchy Water through the tunnel enters Crystal Springs Reservoir.

SFPUC’s multi-billion dollar Water System Improvement Program (WSIP) is a response to the 1989 Loma Prieta Earthquake and the likely seismic event that will occur in the Bay Area in the next 30 years. As one of the last WSIP projects, the Bay Tunnel replaces two aging pipelines (Bay Division 1 & 2) that sit on the Bay floor. The new Bay Tunnel acts as a seismically-reliable lifeline connecting our Hetch Hetchy and East Bay water supplies with customers on the Peninsula and in San Francisco.

Construction on the Bay Tunnel began in April 2010, and the tunnel was just put into service after weeks of testing and disinfection. At \$288 million, the project was delivered on-time and below the original budget estimate of \$313 million.

The Bay Tunnel is one of the last projects in SFPUC’s WSIP — one of the largest water infrastructure improvement programs in the country. Like water utilities in many parts of the country and world, SFPUC is in a race against time to buttress its aging infrastructure. Since 2002, the nearly \$4.8 billion WSIP has strengthened the water lifelines that cross over the major earthquake faults in the Bay Area to deliver high-quality Hetch Hetchy Water to SFPUC customers. Comprised of 83 projects, WSIP is more than 80 percent complete and has seismically strengthened vulnerable pipelines and reservoirs, constructed redundant facilities and completed major projects like this one as well as the seismic slip-joint upgrade project at the Hayward Fault.

WSIP was also an important economic engine helping to sustain our Bay Area economy after the 2008 Recession. Since 2002, WSIP investments have created 11,000 jobs, generated nearly 7,000,000 craft hours for workers and have trained new workforces in skilled trades, all while stimulating our local economy.

The 1989 Loma Prieta earthquake was a wake-up call for the Bay Area, serving as the catalyst for WSIP, the Bay Tunnel, and many other infrastructure projects. The timing could not be more prescient. The US Geologic Service predicts a major earthquake will occur within the next 30 years in the Bay Area.



## San Francisco Water

### Community Benefits

### Assistance Center

We also work with community organizations to provide apprenticeships, on-the-job trainings, and internships for youth and adults that are aligned with our core operations. For instance, we partner with the Sheriff's Department and The Garden Project, a local nonprofit, to employ at-risk youth and ex-offenders for watershed maintenance on SFPUC land. This creates a win-win situation: SFPUC fulfills maintenance and landscaping needs, and participants receive wages and important work experience.

#### Contracting and Business Opportunities

Perhaps one of our most measurable contributions to the community is achieved through embedding community benefits requirements in professional services contracts over \$5 million. This ensures that we partner with businesses that are also committed to leaving positive impacts in the communities they work in. By the end of the year, we will have commitments in 30 contracts with multinational and local engineering, construction, and architecture firms and will have leveraged more than \$6 million to local nonprofit organizations, small businesses, and schools in the form of direct financial contributions, volunteer hours, and in-kind donations over the life of their SFPUC contracts.

While leveraging contracts with large firms is important, small local businesses must be equipped with the tools and resources to adequately get access to, compete for, and perform on large contracts. Our Contractors Assistance Center offers a range of free, tailored services to new and existing local small businesses—from technical assistance and classroom training to networking events—to increase their competitiveness for city contracting opportunities. It's an integral part of our efforts to support workforce and economic development that moves beyond local hire policies and Local Business Enterprise goals.

At the end of the day, being a good neighbor is good for business. Through our community benefits program, we can meet operational goals, raise visibility of our services, build community trust, and serve as catalysts for economic, social, and environmental improvements in the community.

#### CONCLUSION

As public utilities look to the future, our challenges have never been greater. Balancing infrastructure needs, regulatory demands, climate risks, and financial considerations has never been more critical. Yet, our opportunity has never been more abundant. Our sector is driving innovations in technology, engineering, and social well-being.

#### FOR ADDITIONAL INFORMATION:

SAN FRANCISCO PUBLIC UTILITIES COMMISSION WATER SYSTEM IMPROVEMENT PROGRAM WEBSITE:  
<http://sfwater.org/> — Select: Construction >> Water System Improvement Program

#### Congressional Hearing

On December 2, 2014, the Senate Subcommittee on Water and Wildlife held a hearing entitled, "*Innovation and the Utilities of the Future: How Local Water Treatment Facilities are Leading the Way to Better Manage Wastewater and Water Supplies.*"

**IN ADDITION TO HARLEN KELLY'S TESTIMONY, THE FOLLOWING PRESENTATIONS WERE SUBMITTED:**

Jerry Johnson, General Manager, Washington Suburban Sanitary Commission  
*System Improvements & "Going Green"*

Tom Sigmund, Executive Director, Green Bay Metropolitan Sewerage District  
*The Water Resources Utility of the Future is Today*

Andrew H. Kricum, Executive Director and Chief Engineer, Camden County Municipal Utilities Authority  
*The Utility of the Future*

Jeffrey Longsworth, Partner, Barnes & Thornburg  
*Treatment Facilities Lead The Way: Analysis of Negative Impacts of Certain Federal Regulations*

John C. Hall, President, Hall & Associates; Director, Cent for Regulatory Reasonableness

*Innovation and the Utilities of the Future: How Local Water Treatment Facilities are Leading the Way to Better Manage Wastewater and Water Supplies*

**All submitted written testimony is available online at:**

[www.epw.senate.gov/public/index.cfm?FuseAction=Hearings.Home](http://www.epw.senate.gov/public/index.cfm?FuseAction=Hearings.Home) (12/02/2014 options)

**Harlan Kelly** is General Manager of the San Francisco Public Utilities Commission (SFPUC). He previously served as SFPUC's Assistant General Manager, Infrastructure, and was responsible for implementing over \$10 billion in capital programs for water, sewer and power, including the \$4.6 billion Water System Improvement Program, the \$6.9 billion Sewer System Improvement Program, and the \$191 million SFPUC Headquarters and Administration Building. His civil engineering career spanning nearly three decades includes his tenure as the City Engineer of San Francisco. At San Francisco Department of Public Works, he held functional and project management positions. He is a licensed professional engineer, and a graduate of the University of California at Berkeley. He is the recipient of the Municipal Fiscal Advisory Committee's Public Municipal Excellence Award from the San Francisco Planning and Urban Research Association; the Public Works Leader of the Year Award from the American Public Works Association – Northern California Chapter; the Eminent Engineer Award from the National Engineering Honor Society Tau Beta Pi; and the Heroes and Hearts Award from the San Francisco General Hospital Foundation for exceptional community service. He is a member of the Construction Managers Association of America, the American Society of Civil Engineers, the National Society of Black Engineers, and the American Public Works Association. He is co-founder of the youth internship program Project Pull, which has been in continuous operation since 1995, and he has served on the Board of Directors of the Embarcadero YMCA.

## WHOOPING CRANE ESA CASE

FIFTH CIRCUIT REFUSES TO RECONSIDER ESA "TAKE" CHALLENGE

by David Moon, Editor

### INTRODUCTION

The Fifth Circuit Court of Appeals, in an en banc decision, refused to reconsider an earlier decision by a Fifth Circuit panel that had rejected a finding that the Texas Commission on Environmental Quality's (TCEQ's) issuance of water permits resulted in a "take" of endangered whooping cranes. *The Aransas Project v. Texas Comm'n on Environmental Quality, et alia.*, Case No. 13-40317, 5th Circuit (Dec. 15, 2014). The federal court's en banc ruling (i.e., a ruling arising from consideration by all 15 judges of the Fifth Circuit) allows the Fifth Circuit's prior June 30th decision to stand. *The Aransas Project v. Texas Comm'n on Environmental Quality, et alia.*, 7567 F.3d 108 (June 30, 2014)(Whooping Crane Case).

The ruling, with 11 judges voting not to hear the case and four voting in favor of the request to reconsider the June 30th decision, may not be the end of the lawsuit. A vigorous dissent was filed with the opinion, authored by Judge Edward C. Prado and joined by Justices James Dennis and James Graves, which could lead to an appeal by The Aransas Project to the US Supreme Court. A recent article in *The Water Report* — *Federal Endangered Species Acts Decisions* (Richardson, Weinberg, Wang & Fansler, *TWR* #126) — provides detailed discussion regarding the Whooping Crane Case, ESA "takings," and agency liability. See also, Robb, *TWR* #85.

### BACKGROUND

The plaintiffs, The Aransas Project (TAP), brought the lawsuit in federal district court against all three TCEQ Commissioners, TCEQ's executive director, and the South Texas watermaster. The suit alleged that TCEQ's actions — authorizing users to withdraw water upstream that led to a significant reduction in freshwater inflow to the estuary — were responsible for 23 whooping cranes deaths. TCEQ issued new permits to withdraw water from rivers that feed the Guadalupe Bay estuary where the whooping cranes (the Aransas - Wood Buffalo (ABW) flock, named after the cranes' two critical habitats in Canada and the US) make their winter homes in Aransas National Wildlife Refuge. Evidence was introduced in a eight-day trial that the lack of freshwater depleted the cranes' food staples of blue crabs and wolfberries, ultimately resulting in the deaths of 23 whooping cranes in the winter of 2008-2009. The suit maintained that TCEQ's permitting actions thereby resulted in a "take" of an endangered species in violation of the federal Endangered Species Act (ESA).

The trial court (federal district court) found in favor of TAP and "granted an injunction prohibiting TCEQ from issuing new permits to withdraw water from rivers that feed the estuary where the cranes make their winter home. The injunction also required TCEQ to seek an incidental-take permit ('ITP') from the U.S. Fish and Wildlife Service ('FWS')." *Id.* at 2.

The Fifth Circuit panel of three judges, however, reversed the trial court's decision. The Fifth Circuit concluded that "the district court's opinion misapplies proximate cause analysis and further, even if proximate cause has been proven, the injunction is an abuse of discretion." *Id.* Essentially, the Fifth Circuit decided that the lower court did not establish a causal connection — under the legal standard of proximate cause — between TCEQ's actions and the cranes' deaths: "Nowhere does the court explain why the remote connection between water licensing, decisions to draw river water by hundreds of users, whooping crane habitat, and crane deaths that occurred during a year of extraordinary drought compels ESA liability." *Id.* at 24. The Fifth Circuit summed up its conclusion that proximate cause and foreseeability were lacking as a matter of law: "Finding proximate cause and imposing liability on the State defendants in the face of multiple, natural, independent, unpredictable and interrelated forces affecting the cranes' estuary environment goes too far." *Id.* at 31. See Water Briefs, *TWR* #125, for more details on the Fifth Circuit's decision and Taylor, *TWR* #110, for additional background.

### THE DISSENT

Judge Prado's ten-page dissent concluded that TAP's petition for an en banc rehearing before the (entire) Fifth Circuit should be granted, noting that the Fifth Circuit panel's June 30th decision "independently weighs facts to render judgment in violation of fundamental principles of federal law." *Dissent* at 3. Citing *Pullman-Standard v. Swint*, 456 U.S. 273, 290 (1982), Judge Prado points out that "the Court emphasized that it is an 'elementary' principle of our system of justice that, as between district judges and the appellate bench, '[f]actfinding is the basic responsibility of district courts, rather than appellate courts.' *Id.* at 291-92 (quoting *DeMarco v. United States*, 415 U.S. 449, 450 n.94 (1974))." The dissent goes on to give the following admonition: "If uncorrected by this Court en banc or the Supreme Court, this decision, and others like it, sends a clear message to litigants: if you don't like the factual findings of a district court, the doors of our Court are wide open to endless retrials on appeal." *Id.* at 4.

## Whooping Crane Case

### Rehearing Rejected

### Vigorous Dissent

### Alleged ESA "Take"

### Trial Court Decision

### Fifth Circuit Reversal

### "Proximate Cause"

### Fact Finding v. Appellate Review

## Whooping Crane Case

### Credibility Deference

### Clear Error v. De Novo Review

### Proximate Cause

### "Take" Conclusions

### Evidence Reweighed

### Permitting Decisions

### ESA Take

The dissent goes on to harshly criticize the Fifth Circuit's fact finding, stating that "[T]he reweighing of facts in this case is particularly egregious. The trial judge made specific credibility determinations after an eight-day bench trial that included ten expert witnesses." Judge Prado then cited *Anderson v. City of Bessemer City, N.C.*, 470 U.S. 564, 575 (1985) in support of this point: "When findings are based on determinations regarding the credibility of witnesses, Rule 52(a) [of the Federal Rules of Civil Procedure] demands *even greater deference* to the trial court's findings..." (emphasis added). The dissent's credibility position was bolstered by referring back to the trial judge's findings. "The trial judge found The Aransas Project's witnesses credible and disbelieved the defendants' and intervenors' witnesses — and for good reason: The Aransas Project's witnesses included a shared recipient of the 2007 Nobel Prize for his work as an environmental scientist, holders of endowed chairs at prestigious national universities, MacArthur Fellows, and authors of numerous scientific papers in respected journals. In contrast, the other side's expert witnesses had limited experience and insignificant expertise — indeed, one of them admitted he 'made up' key portions of his testimony." *Dissent* at 5.

The dissent then noted that the Fifth Circuit panel's "ruling that the plaintiffs failed to show proximate cause as a matter of law — decidedly a question of fact — is equally puzzling. As discussed *infra*, to render judgment on this issue, the panel was required to conclude 'the record permits only one resolution of the factual issue.' *Pullman-Standard*, 456 U.S. at 292." *Id.* at 6. In other words, the dissent pointed out that an appellate court should not overturn a trial court on a factual question *unless* it concludes that there is only one "resolution of the factual issue" possible and that the trial court was clearly erroneous in its findings of fact. If the facts show instead that relevant evidence was considered by the trial court, the appellate court should not substitute its own fact finding, but should defer to the findings of the trial court. While discussing the law on proximate cause and the question of "closeness between cause and effect" Judge Prado articulates the underlying factual issue — "[I]t is beyond dispute that harms to downstream water users are among the risks of carelessly regulating upstream users." The dissent later discusses in additional detail the distinctions between the "clear error" standard for an appellate court versus a "de novo review" (where a higher court would re-try the case). *Dissent* at 10-11.

Judge Prado goes on to compare another Fifth Circuit decision that found proximate cause existed; the case involved the government's timber policy and its impact on endangered woodpeckers. "The connection in this case — between the TCEQ allowing freshwater to be diverted, a reduction in freshwater inflows, the increased salinity in the whooping crane habitat, and observed impaired feeding behavior — is similar to the causal connection in *Sierra Club v. Yeutter* [926 F.2d 429 (5th Cir. 1991)]. If the difference between 80- and 100-year-old trees can support a finding of a 'take,' surely a district court — faced with emaciated crane corpses — could reasonably conclude that a reduction of freshwater inflows into the critical habitat of the AWB flock significantly impaired feeding behavior and proximately caused a 'take' here. Moreover, unlike in *Sierra Club v. Yeutter*, the increased mortalities of whooping cranes from reduced freshwater inflows were not only foreseeable — they were in fact foreseen and anticipated. In 2007, two years before the 'take' here, the International Recovery Plan for the Whooping Crane, prepared by the U.S. Fish & Wildlife Service in consultation with the Texas Parks & Wildlife Department, concluded that: 'Freshwater inflows starting hundreds of kilometers inland, primarily from the Guadalupe and San Antonio rivers, flow into whooping crane critical habitat at Aransas; these inflows are needed to maintain proper salinity gradients, nutrient loadings, and sediments that produce an ecologically healthy estuary.' U.S. Fish & Wildlife Serv., International Recovery Plan Whooping Crane..." *Dissent* at 8-9 (citation omitted).

The dissent's analysis goes into significant depth regarding the "proximate cause" issue and the appellate court's standard of review that is well worth reading in full. Judge Prado and the dissent's position on the standard of review was concisely set out near the end of the dissent. "In sum, the panel disregarded the district court's credibility determinations and reweighed the evidence." *Id.* at 11.

### CONCLUSION

The Fifth Circuit panel's decision in the Whooping Crane Case, as it currently stands, impacts water agencies throughout the United States especially in regard to how much deference is owed to environmental authorities (agencies) for their permit decisions affecting endangered species.

In the Whooping Crane Case, the federal district court ruled against the state agency (TCEQ) and found that its actions resulted in an ESA "take." The Fifth Circuit reversed that decision on the basis of proximate cause. Given the dissent in the en banc decision, the issue is now framed as to the level of deference that an appellate court should give to the trial court's findings of fact — specifically on the issue of proximate cause and TCEQ's permitting action. The US Supreme Court may yet come into play in sorting out appellate court deference as it relates to ESA issues.

#### FOR ADDITIONAL INFORMATION:

Fifth Circuit En banc Order and Dissent (en banc) at: [www.ca5.uscourts.gov/opinions/pub/13/13-40317-CV1.pdf](http://www.ca5.uscourts.gov/opinions/pub/13/13-40317-CV1.pdf); June 30th Decision at: [www.ca5.uscourts.gov/opinions/pub/13/13-40317-CV0.pdf](http://www.ca5.uscourts.gov/opinions/pub/13/13-40317-CV0.pdf)



## WATER BRIEFS

**FRACKING SETTLEMENT US  
FILL MATERIAL DISCHARGES**

In December, the US Environmental Protection Agency (EPA) and Department of Justice (DOJ) announced that XTO Energy, Inc. (XTO), a subsidiary of ExxonMobil and the nation's largest holder of natural gas reserves, will spend an estimated \$3 million to restore eight sites damaged by unauthorized discharges of fill material into streams and wetlands in connection with hydraulic fracturing operations. XTO will also implement a comprehensive plan to comply with federal and state water protection laws at the company's West Virginia oil and gas extraction facilities that use horizontal drilling methods.

XTO will pay a civil penalty of \$2.3 million for violations of Section 404 of the Clean Water Act (CWA), which prohibits the filling or damming of wetlands, rivers, streams, and other waters of the US without a permit from the US Army Corps (Corps). The settlement resolves alleged violations of state law asserted by the West Virginia Department of Environmental Protection (WVDEP). West Virginia is a co-plaintiff and will receive half of the \$2.3 million civil penalty.

The settlement alleges that XTO impacted streams and discharged sand, dirt, rocks and other fill material into streams and wetlands in order to construct well pads, road crossings, freshwater pits, and other facilities related to natural gas extraction. It also alleges that the violations impacted more than 5,300 linear feet of stream, and 3.38 acres of wetlands. The settlement requires XTO to fully restore the wetlands and streams wherever feasible, monitor the restored sites to assure the success of the restoration, and implement a comprehensive compliance program to ensure future compliance with the CWA and applicable state law.

EPA discovered some of the violations through information provided by the state and through routine joint inspections conducted with the Corps. The company voluntarily disclosed potential violations at five of the sites following an internal audit. The consent decree, lodged in the Northern District of West Virginia, is subject to a public comment period and court approval.  
**For info:** Jennifer Colaizzi, 202/ 564-7776, Colaizzi.jennifer@epa.gov or [www2.epa.gov/enforcement/xto-energy-inc-settlement-2014](http://www2.epa.gov/enforcement/xto-energy-inc-settlement-2014)

**INTEGRATING STORAGE CA  
SUPPLY & STORAGE ANALYSIS**

California's approval of a \$7.5 billion water bond has bolstered prospects for expanding reservoirs and groundwater storage, but the drought-prone state can effectively use no more than a 15% increase in surface water storage capacity because of lack of water to fill it, according to a new analysis released in November. The report by UC Davis, The Nature Conservancy (TNC), and three prominent water consultants, said California could potentially use up to 6 million acre-feet in combined additional surface and groundwater storage. Exceeding this expansion runs into limits of available precipitation and the ability to transport water. "Reservoir storage does not equate to water supply," said Jay Lund, lead author of the report and director of the UC Davis Center for Watershed Sciences.

"*Integrating Storage in California's Changing Water System*" evaluates the possibilities of increasing water storage capacity. The study does not encompass economic or environmental analysis to determine whether additional storage is justified. Rather, they determined the maximum that could be used, both with and without coordination with other parts of California's water system. The study comes as the California Water Commission begins developing rules for allocating investments in storage projects from funds recently approved in California's Proposition 1. More than a third of the \$7.5 billion in the water bond is allocated for additional surface and groundwater storage.

Overall, the report advocates a more integrated approach to surface and groundwater water storage where storage projects are planned, designed and operated as components of a statewide system. Such an integrated analysis would include a wide variety of water sources and delivery alternatives, and potential changes in how water is managed to meet California's multiple water demands.

Such an approach would be a departure from most project analyses that examine water storage proposals as isolated projects, according to co-author Maurice Hall, California water science and engineering lead for TNC.

The authors said that with a science-based approach to investing in water storage projects, there is great potential to develop more sustainable

storage and water management strategies. Integrated water projects are likely to "significantly outperform" individual projects in achieving multiple water management objectives. The authors note that this study looks exclusively at storage considerations for surface and groundwater storage, and does not look at comprehensive water conservation strategies, system re-operation, water rights apportionment or other water policy considerations that may stretch existing water supplies.

**For info:** Jay Lund, Center for Watershed Sciences, 530/ 752-5671 or [jrlund@ucdavis.edu](mailto:jrlund@ucdavis.edu); Report at: [https://watershed.ucdavis.edu/files/biblio/Storage\\_White\\_Paper\\_20Nov2014.pdf](https://watershed.ucdavis.edu/files/biblio/Storage_White_Paper_20Nov2014.pdf)

**SPECULATION/FRACKING NM  
TRANSFER/CHANGE REQUEST**

On November 14, the WildEarth Guardians (Guardians) filed a Protest to an application filed in New Mexico by Schmitz Land, LLC (Schmitz) to change an existing groundwater right for livestock and domestic use (24 acre-feet of consumptive use) to industrial oil field water and fire fighting uses. The application also proposes to change the place of use to anywhere within one million acres in three different counties. OSE File No. SJ-2431.

The Guardians' Protest alleges several grounds for denying the change application: (1) that it "would be contrary to the conservation of water within the State of New Mexico and detrimental to the public welfare"; (2) that the new use would either "fully consume the permitted amount of water or significantly degrade the quality of any remaining water" due to the likely use of hydraulic fracturing ("contrary to the conservation of water in the State and detrimental to the public welfare"); (3) that the "State Engineer's duty to the conservation of water and the protection of public welfare necessarily includes the protection of water quality" which would inevitably be negatively impacted by the proposed use; and (4) that "this Application represents water speculation of the worst kind. The Application contemplates changing the place of use of the water right from a specifically described parcel of land in Rio Arriba County to a vaguely described area encompassing three counties and over one million acres of land." Finally, the Protest raises the issue of water availability, "[B]ased on the limited availability of water...this Application

## WATER BRIEFS

— if not denied — will set a precedent allowing the reallocation of important high quality water permitted for domestic, livestock and wildlife uses to be changed to serve industrial purposes that will render the water unusable due to the poor quality or will fully consume it.” *Protest* at 1-4.

The Guardians filed the Protest to stop what they believe will be unsustainable practices arising from widespread use of water for hydraulic fracturing (fracking). According to the Guardians, currently the majority of the water taken from the aquifer returns back to the underground basin or to rivers and streams with little to no impact on its quality. However, if the water is used for fracking, the water pumped from the aquifer will be permanently rendered polluted with chemicals, heavy metals, and radioactivity so as to be unusable.

The assertion of speculation is an interesting twist that bears watching. “The Applicant either refuses to identify the specific locations of future water use or does not know the locations of possible future use because such use is purely speculative. The Applicant appears to be seeking a change in purpose and place of use of this water, in the hopes of a coming oil rush, to sell it to the highest bidders.” *Protest* at 3. Western states generally prohibit *obtaining* new water rights for speculative purposes, either by rule, statute or case law. Here, speculation is being asserted to prevent a change of a water right to a new purpose, where the end user is not identified and instead a huge area of land is simply listed as the potential place of use.

**For info:** Jan Pelz, Guardians, 303/884-2702 or [www.wildearthguardians.org](http://www.wildearthguardians.org); *Protest* and *Applicaton* documents available from TWR upon request

## WATER/ENERGY NEXUS TX EPA CLEAN POWER PLAN

EPA’s Clean Power Plan (CPP) proposal is intended to cut carbon pollution (CO<sub>2</sub> emissions) from existing power plants, the single largest source of carbon pollution in the US. EPA asserts the proposal will: protect public health; move toward a cleaner environment; and fight climate change while supplying reliable and affordable power. Decision-makers are also concerned about how this policy will affect power costs. CNA Corporation (CNA) on November 19 released a report finding

that under CPP, Texas’ power sector could cut water consumption by 21% from 2012 figures (approximately 88,000 acre-feet per year). CNA found that Texas could meet these targets with modest effort and a small cost savings.

Paul Faeth, director of CNA’s Energy, Water, and Climate Division is author of the report, *The Impacts of EPA’s Clean Power Plan on Electricity Generation and Water Use in Texas*.

Texas’ coal, natural gas, and nuclear electricity-generating plants rely on considerable water resources for cooling operations, making them vulnerable to low water flows and high water temperatures. The changes called for in the CPP — greater energy efficiency, increased use of wind and other renewable energy, more generation from high-efficiency natural gas plants and less from coal-fired operations — would all help during a drought.

Energy efficiency avoids the need for new generating capacity, not only avoiding water use for cooling, but also avoiding CO<sub>2</sub> emissions. It is inexpensive compared to new generating capacity. Wind power does not use any water, while combined-cycle natural gas (NGCC) plants require about half as much water for cooling as coal plants using the same technology. Energy efficiency and wind have no CO<sub>2</sub> emissions, and emissions from NGCC are half or less compared to coal. These options dramatically reduce air pollutants compared to coal. Nitrogen oxides, which cause smog, would be cut by 29% by 2029 compared to 2012.

CNA found that because Texas has been switching from coal-fired plants to natural gas and continues to develop wind power, the state will make significant cuts in its CO<sub>2</sub> emissions intensity even if the new EPA rule is not taken into account. In 2012, the state emitted 1,284 pounds of CO<sub>2</sub> for every megawatt-hour of electricity produced. Without any policy changes, by 2029 Texas would reduce that rate by 26% — 70% of the final target. This would be just 12 percentage points shy of the CCP’s proposed 38% cut. Most of the remainder could be achieved through greater energy efficiency. EPA does not prescribe how the CPP should be implemented.

**For info:** Report at: [www.cna.org/ewc/water-use-texas](http://www.cna.org/ewc/water-use-texas); CPP website: [www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule](http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule)

## WATER INVESTMENTS US

### FEDERAL GUIDELINES RELEASED

On December 17, the Obama administration released final Principles, Requirements and Guidelines (PR&G) for Federal investments in water resources — the first update to these guidelines in more than three decades. In addition to cutting costs and accelerating project approvals, the new PR&G guides federal agencies to support water infrastructure projects with the greatest economic and community benefits. By involving local communities and soliciting input, the PR&G will make it easier for the federal government to support water infrastructure projects while helping avoid conflict and project delays by encouraging early, front-end engagement to address problems before they develop. The PR&G lays out broad principles to guide water investments and provides direction to agencies on implementing the Principles and Requirements.

Since 1983, the Principles and Guidelines have provided direction to federal agencies when evaluating and selecting major water projects, including projects related to navigation, storm resilience, water supply, wetland restoration, and flood prevention. 1983 standards used a narrow set of parameters to evaluate water investments, making it difficult for agencies to support a range of important projects that communities want, or in some cases, precluding support for good projects. Lack of local support for selected projects can lead to substantial project delays, costing taxpayers and leaving communities at risk. The updates allow agencies to better consider the full range of long-term economic benefits associated with water investments. This includes protecting communities against future storm damage and promoting recreational opportunities that support local business, as well as their water delivery, navigation, and flood prevention functions.

Developed through interagency collaboration, the Guidelines lay out the detailed methodology for conducting implementation studies, clarifying terminology as well as the applicability of and analysis called for under implementation of the PR&G.

**For info:** PR&G at: [www.whitehouse.gov/administration/eop/ceq/initiatives/PandG](http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG)

## WATER BRIEFS

## YAKIMA BASIN PLAN WA

## COST-BENEFITS FOUND WANTING

On December 15, the Washington Water Research Center (WWRC) released a study entitled “*Benefit-Cost Analysis of the Yakima Basin Integrated Plan Projects*” (*Benefit-Cost*). The 2013 Washington legislature tasked the WWRC to prepare the cost benefit analysis on each of the elements of the Yakima Basin Integrated Plan (Yakima Plan). *The Water Report* has covered the Yakima Basin Integrated Plan process extensively over the last several years. For background information, see Malloch & Garrity, *TWR* #106; Evans, Forsgaard, Maykut & Packard, *TWR* #108; and Malloch & Garrity, *TWR* #108. The Yakima Plan continues to generate controversy. This report, which finds some aspects of the Plan to be not cost-effective, is not likely to end the debate.

As previously reported in the *TWR* articles referenced above, public interest groups are split over support for the Yakima Basin Plan.

The Center for Environmental Law & Policy (CELP), which describes itself as the Washington State’s water watchdog, summarized the *Benefit-Cost*’s principle findings as follows:

The [*Benefit-Cost*] analysis for the Yakima Plan contains the following six points:

- 1) The major storage projects of the Yakima Plan, when implemented together, are unlikely to provide positive net benefits.
- 2) Net benefits for individual water storage projects are negative, with some exceptions under the most adverse climate and water market conditions.
- 3) Instream flow benefits for fish are insufficient to support water storage infrastructure given the net benefit shortfall in out-of-stream use benefits, but proposed instream flows may be supportable through market purchases.
- 4) Insufficient evidence exists to assess the economic efficacy of fish habitat restoration with a useful degree of precision.
- 5) Reservoir fish passage projects are likely to provide positive net benefits through their pivotal role in supporting wild Sockeye reintroduction into the basin.
- 6) Water markets show potential for reducing the impacts of basin-wide curtailment.

CELP November 25 Press Release, See: [www.celp.org/category/yakima-river-basin/](http://www.celp.org/category/yakima-river-basin/)

On the other hand, Michael Garrity of American Rivers (a party to the Yakima Basin Plan agreement), has written:

It is no surprise that the WSU analysis finds parts of the Yakima Plan worth doing and others not worth the price. The Yakima Plan was developed to address many needs in the Yakima River watershed, not just economic needs, and it looks ahead to climate changed conditions never before experienced. Supporters of the Plan are working to find and implement solutions to a huge set of historically divisive economic, social, and environmental challenges — decimated salmon fisheries, ESA-listed steelhead and bull trout, drought, climate change, flood management, maintaining a strong agricultural base, and building a stronger recreational economy. Compromise and balance are needed if solutions are to take root. We all must move forward together or we won’t move forward at all.

The WSU report takes greatest exception to the value of water storage projects. In the last century, water storage projects like those included in the Yakima Plan would have been built at taxpayer cost with enormous subsidies for the water users. But in the Yakima, *farmers and other water users will pay for their share of these projects with their own money, and pay for them with interest*. This strongly suggests that WSU’s assumption about the low value of additional water supplies is wrong. Those who will actually pay for the water supply projects are willing to put down their own money with interest instead of relying on taxpayer dollars.

The report fails to recognize the value of water conservation and efficiency projects in the Yakima Basin, which help to extend water supplies for farms and communities and to improve instream flows in critical reaches of the mainstem Yakima and Naches rivers as well as on tributaries. It seems that the inherently “integrated” benefits of conservation, efficiency, and better water management were just too difficult for WSU to calculate using an approach that focused on getting more water out of the river in times of drought.

Mr. Garrity’s entire blog on these issues is scheduled to appear on Yakima Basin Conservation Campaign website this month ([www.yakimaforever.org/about/supporters/](http://www.yakimaforever.org/about/supporters/)).

The *Benefit-Cost* report is worth reviewing extensively, due to the complex nature and to understand the approach of the study. *The Water Report* plans on publishing a more detailed look at Yakima Plan issues in the coming months.

**For info:**

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Rachael Paschal Osborn, CELP, 509/ 954-5641 or [rdpaschal@earthlink.net](mailto:rdpaschal@earthlink.net)

*Benefit-Cost* Report available at: [http://swwrc.wsu.edu/documents/2014/12/ybip\\_bca\\_swwrc\\_dec2014.pdf](http://swwrc.wsu.edu/documents/2014/12/ybip_bca_swwrc_dec2014.pdf)  
[www.yakimaforever.org/about/supporters/](http://www.yakimaforever.org/about/supporters/)



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**January 15-16** AZ  
**Tribal Water in the Southwest Seminar, Scottsdale.** Courtyard Scottsdale Salt River. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**January 17-21** TX  
**2015 International Low Impact Development (LID) Conference, Houston.** For info: www.asce.org/ewri/Conferences/

**January 20** OR  
**The Fifth IPCC Assessment of Climate Change - Key Facts & Their Implications for Our Future (Brownbag), Portland.** Wells Fargo Bldg., 21st Floor, 1300 SW Fifth Avenue, 12-1:15 pm. RSVP to cbodine@schwabe.com. For info: www.ipcc.ch/

**January 22-23** WA  
**22nd Annual Endangered Species Act Conference, Seattle.** Hilton Seattle. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**January 22-23** LA  
**Climate Change Law & Regulations: Planning for a Carbon-Constrained Regulatory Environment Institute, New Orleans.** Hotel Monteleone. Presented by Rocky Mt. Mineral Law Foundation. For info: RMMLF, www.rmmlf.org

**January 23** CA  
**Hydraulic Fracturing Conference, San Francisco.** Hotel Nikko. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**January 23** CA  
**CEQA Update, Issues & Trends Course, Sacramento.** Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 530/ 757-8777 or https://extension.ucdavis.edu/section/ceqa-update-issues-and-trends

**January 24** CA  
**Wasted Water: Reasonable Use Law in 21st Century California - 11th Annual Symposium, San Francisco.** Golden Gate University School of Law. For info: www.waterlawssymposium.com/

**January 28** AZ  
**Colorado River Simulation System - Overview & Use in Planning & Operation of the Colorado River (Brown Bag Seminar), Tucson.** WRRC Sol Resnick Conf. Rm., 350 N. Campbell Ave. Presented by Arizona Water Resources Research Center - Speaker Don Gross, Water Resources Engineer, Colorado River Management Section, Arizona Department of Water Resources. For info: https://wrcc.arizona.edu/

**January 28-30** CO  
**Colorado Water Congress Annual Convention, Denver.** Hyatt DTC. For info: www.cowatercongress.org/cwc\_events/Annual\_Convention.aspx

**January 29-30** TX  
**Texas Wetlands Conference, Austin.** Omni Southpark. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 1-3** TX  
**2015 Industrial & Commercial Water Reuse Conference, Austin.** Hilton Austin. Presented by WaterReuse Ass'n. For info: www.watereuse.org/industrial-commercial-2015

**February 3-5** WA  
**River Restoration Northwest Symposium, Stevenson.** Skamania Lodge. Presented by River Restoration Northwest. For info: http://rtnwsymposium.org/

**February 3-5** HI  
**Enhancing Hawai'i's Water Resources for the Future: 2015 Pacific Water Conference, Honolulu.** Hawai'i Convention Ctr. Presented by American Water Works Association/Hawai'i Section & Hawai'i Water Environment Ass'n. For info: www.pacificwaterconference.com

**February 9-11** TX  
**Underground Injection Control (UIC) Conference, Austin.** Radisson Hotel Downtown. Presented by the Ground Water Protection Council. For info: www.gwpc.org/events

**February 9-13** AK  
**Alaska Forum on the Environment 2015, Anchorage.** Denai'ina Convention Ctr. For info: Alaska Forum, http://akforum.com/

**February 10-12** NM  
**Advancing Riparian Restoration in the West: Tamarisk Coalition's Annual Conference, Albuquerque.** Hotel Albuquerque at Old Town. For info: www.tamariskcoalition.org/about-us/events/2015-conference

**February 10-12** OR  
**ESRI Water Conference: Mapping a Smarter Utility, Portland.** Marriott Downtown Waterfront. For info: www.esri.com/events/water

**February 11** CA  
**Climate Change Litigation Seminar, San Francisco.** Le Méridien. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**February 11-13** CO  
**Snow School for Water Managers, Silverton.** Presented by Center for Snow & Avalanche Studies. For info: www.coloradomesa.edu/watercenter/documents/CSASSnowSchoolFlyer2015.pdf

**February 15-18** OR  
**Environmental Connection: World's Largest Soil & Water Event, Portland.** Portland Convention Ctr. Presented by International Erosion Control Ass'n. For info: www.ieca.org/conference/annual/ec.asp

**February 17-18** NV  
**Indian Water Rights & Water Law Seminar, Las Vegas.** For info: www.falmouthinstitute.com/training/public/feb/NR002.html?utm\_source=cc&utm\_medium=email&utm\_campaign=ccemailPUB1502

**February 19** CA  
**Endangered Species Regulation & Protection Course, Sacramento.** Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 530/ 757-8777 or https://extension.ucdavis.edu/section/endangered-species-regulation-and-protection

**February 19-20** CA  
**Western Water Law Conference, San Diego.** The Westin. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 19-20** NM  
**Watershed CPR: Restoring Natural, Built & Human Environments - 2015 Land & Water Summit, Albuquerque.** Sheraton Albuquerque Airport. Presented by Xeriscape Council of New Mexico. For info: http://xeriscapenm.com/

**February 19-20** NV  
**Road Map 2015 - A Farmer's Guide to the Water Universe: Family Farm Alliance Annual Meeting, Las Vegas.** Monte Carlo Resort. For info: www.familyfarmalliance.org

**February 25-26** DC  
**ACWA 2015 DC Conference, Washington.** The Liason Hotel. Presented by Ass'n of California Water Agencies. For info: www.acwa.com/events/dc-conference

**February 27** GA  
**14th Annual Georgia Water Law & Regulation Seminar, Atlanta.** Georgia World Congress Center. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

**February 27** CO  
**Colorado Water Law Conference, Denver.** Grand Hyatt. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

**February 27** OR  
**The Freshwater Trust 2015 Gala & Auction - 32nd Annual, Portland.** Portland Art Museum. For info: www.thefreshwaterttrust.org

**March 2-3** CA  
**Groundwater Law & Regulation Seminar, Sacramento.** Tsakopoulos Library Galleria. For info: Law Seminars Int'l, 800/ 854-8009, registrar@lawseminars.com or www.lawseminars.com

**March 3** GA  
**Key Environmental Issues in U.S. Environmental Protection Agency Region 4 Conference, Atlanta.** State Bar of Georgia Conference Ctr. For info: http://shop.americanbar.org/ebus/ABAEventsCalendar/EventDetails.aspx?productid=135022897&sc\_cid=NR15031-C1

**March 5** AZ  
**UA Water Sustainability Program's Distinguished Speaker: Brian Richter, Tucson.** UA Student Union, 1303 E. University Blvd. Presented by Water Resources Research Center & Water Sustainability Program. For info: wrcc@arizona.edu



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## CALENDAR

(continued from previous page)

**March 5-6** **NM**

**Law of the Rio Grande Conference, Santa Fe.** La Fonda on the Plaza. For info: CLE Int'l, 800/ 873-7130 or [www.cle.com](http://www.cle.com)

**March 5-8** **OR**

**Public Interest in Environmental Law Conference: Changing Currents, Eugene.** University of Oregon. Presented by Environmental & Natural Resources Law Center. For info: <http://pielc.org/about-us/>

**March 10** **WA**

**Hydrology and the Law Seminar, Seattle.** TBA. For info: Law Seminars Int'l, 800/ 854-8009, [registrar@lawseminars.com](mailto:registrar@lawseminars.com) or [www.lawseminars.com](http://www.lawseminars.com)

**March 11** **WA**

**Managing Stormwater in Washington Conference, Tacoma.** Presented by Northwest Environmental Business Council. For info: [www.nebc.org/](http://www.nebc.org/)

**March 11-13** **TX**

**Design-Build for Water/Wastewater Conference, San Antonio.** Henry B. Gonzalez Convention Center. For info: [www.dbia.org/Conferences/water/Pages/default.aspx](http://www.dbia.org/Conferences/water/Pages/default.aspx)

**March 12-13** **DC**

**Natural Resources Damages Seminar, Washington.** Thurman Arnold Bldg.. For info: Law Seminars Int'l, 800/ 854-8009, [registrar@lawseminars.com](mailto:registrar@lawseminars.com) or [www.lawseminars.com](http://www.lawseminars.com)

**March 15-17** **CA**

**WaterReuse California Annual Conference, Los Angeles.** Millennium Biltmore Hotel. For info: [www.watereuse.org/](http://www.watereuse.org/)

**March 15-18** **OR**

**American Water Works Association Sustainable Water Management Conference, Portland.** Marriott Downtown Waterfront. For info: [www.awwa.org/conferences-education/conferences/sustainable-water-management.aspx](http://www.awwa.org/conferences-education/conferences/sustainable-water-management.aspx)

**March 16-18** **TX**

**National Groundwater Ass'n 2015 Groundwater Summit, San Antonio.** Grand Hyatt. For info: <http://groundwatersummit.org/>

**March 18** **CA**

**Water Gala '15: Imagine H2O's 6th Annual Celebration, San Francisco.** The Palace Hotel. For info: [www.imagineh2o.org/watergala15](http://www.imagineh2o.org/watergala15)

**March 19-20** **TX**

**Estimating Rates of Groundwater Recharge Course, San Antonio.** Grand Hyatt. Presented by Nat'l Groundwater Ass'n. For info: [www.ngwa.org/Events-Education/shortcourses/Pages/125mar15.aspx](http://www.ngwa.org/Events-Education/shortcourses/Pages/125mar15.aspx)

**March 19-20** **TX**

**Fundamentals of Groundwater Geochemistry Course, San Antonio.** Grand Hyatt. Presented by Nat'l Groundwater Ass'n. For info: [www.ngwa.org/Events-Education/shortcourses/Pages/235mar15.aspx](http://www.ngwa.org/Events-Education/shortcourses/Pages/235mar15.aspx)

**March 22-25** **DC**

**Ass'n of Metropolitan Water Agencies 2015 Water Policy Conference, Washington.** The Liason Hotel. For info: [www.amwa.net/event/2015-water-policy-conference](http://www.amwa.net/event/2015-water-policy-conference)

**March 26-27** **CA**

**Endangered Species Act Conference, San Diego.** The Westin. For info: CLE Int'l, 800/ 873-7130 or [www.cle.com](http://www.cle.com)

**March 26-27** **OK**

**2015 Student Water Conference, Stillwater.** Oklahoma State University. Hosted by OSU. For info: Dr. Garey Fox, [garey.fox@okstate.edu](mailto:garey.fox@okstate.edu) or <http://studentwater.okstate.edu/content/swc>

**March 26-28** **CA**

**44th Spring Conference: ABA Superconference on Environmental Law, San Francisco.** Palace Hotel. For info: <http://shop.americanbar.org/abus/ABAEventsCalendar/EventDetails.aspx?productId=131644078>

**March 27-29** **AZ**

**Balance - Unbalance International Conference: Water, Climate, Place: Reimagining Environments Conference, Tempe.** ASU Campus. Presented by Global Institute of Sustainability at ASU. For info: <https://sustainability.asu.edu/events/rsvp/balance-unbalance>

**March 27** **OR**

**Floodplains Seminar, Portland.** Hilton Executive Tower. For info: The Seminar Group, 800/ 574-4852, [info@theseminargroup.net](mailto:info@theseminargroup.net) or [www.theseminargroup.net](http://www.theseminargroup.net)

**March 30-April 1** **CA**

**2015 AWRA Spring Specialty Conference on Water for Urban Areas, Los Angeles.** Airport Hilton. For info: AWRA, [www.awra.org/meetings](http://www.awra.org/meetings)

**April 8** **CO**

**Aspinall Lecture by F. Ross Peterson - Proving Powell's Prognostications Erroneous: The Colorado River Basin & the Manipulation of Water, Grand Junction.** Colorado Mesa University. Presented by the Aspinall Foundation & Colorado Mesa University. For info: [www.coloradomesa.edu/aspinall/lectureship.html](http://www.coloradomesa.edu/aspinall/lectureship.html)

**April 9-10** **HI**

**Endangered Species Act Conference, Honolulu.** YMCA. For info: The Seminar Group, 800/ 574-4852, [info@theseminargroup.net](mailto:info@theseminargroup.net) or [www.theseminargroup.net](http://www.theseminargroup.net)