The Water Report™
Water Rights, Water Quality & Water Solutions in the West

In This Issue:

Upcoming Stories:

Tribal Groundwater

Air Force Base Cleanup

Reuse Standards

& More!

TEXAS SURFACE WATER AND WHOOPING CRANE DISPUTE

FROM LITIGATION TO COLLABORATION

by Todd Votteler, Ph.D., Guadalupe-Blanco River Authority (Seguin, TX)

INTRODUCTION

In December 2015, the Guadalupe-Blanco River Authority and The Aransas Project began a search for common ground. The two organizations had spent years in litigation over the use of water in the Guadalupe River concerning how that use affects the wintering population of the endangered whooping cranes (*Grus americana*). On February 24, 2016, the two former antagonists announced collaboration on a process to address human and environmental issues for the benefit of the Guadalupe River system, including San Antonio Bay and the Guadalupe Estuary, and to obtain funding for studies and projects for this effort. On November 29, 2016, the original agreement was revised substantially and the effort is now forging ahead.

BACKGROUND

The *Aransas Project v Shaw, et al.* Litigation

The Guadalupe-Blanco River Authority (GBRA) is a water conservation and reclamation district that was established by the Texas Legislature in 1933. GBRA provides stewardship for the water resources in its ten county statutory district, which begins near the headwaters of the Guadalupe River and includes San Antonio Bay in the Gulf of Mexico. GBRA provides services that include: hydroelectric generation; water and wastewater treatment; municipal, industrial, and agricultural raw water supply; and recreational operations.

The Aransas Project (TAP), is a non-profit, Texas corporation comprised of member organizations and individuals, including: the International Crane Foundation; Aransas County; the City of Rockport; various Audubon Societies; the American Bird Conservancy; various fishing and nature-related organizations; and several individuals and corporations located primarily in Aransas County. TAP supports responsible water management that is reasonable, sustainable and environmentally sound. TAP was originally created to bring Texas water and whooping crane issues to federal court.

This story begins in March 2010, when TAP sued the Texas Commission on Environmental Quality (TCEQ) using the federal Endangered Species Act (ESA) in the US District Court in Corpus Christi. TAP asserted that mismanagement of the Guadalupe and San Antonio Rivers (the major tributary to the Guadalupe River) harmed the whooping cranes that winter at the Aransas National Wildlife Refuge. Whooping Cranes have been listed as endangered under the ESA since its enactment in 1973. In a December 2011 trial in the US District Court in Corpus Christi, TAP alleged that TCEQ violated the "taking" provision of ESA Section 9. That provision prohibits a "take," which the ESA states: "means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" effecting species listed as endangered.

Texas Water Dispute Resolution

Water Permits

Litigation

TAP alleged that during drought, a reduced amount of freshwater reached the coastal marshes and caused the salinity to rise, thereby preventing whooping cranes from finding sufficient food and water. TAP claimed that the low flows in 2008-09 weakened the cranes, resulting in the deaths of 23 birds. GBRA intervened in the litigation, now known as *The Aransas Project v. Shaw et al*., as a defendant (Dr. Bryan Shaw is the Chairman of TCEQ). In March 2013, a federal judge in Corpus Christi, Judge Janis Jack, ruled in favor of TAP. The ruling prohibited TCEQ from issuing new water permits on the Guadalupe and San Antonio Rivers. Judge Jack ordered Texas to develop a habitat conservation plan to ensure freshwater inflows for the whooping cranes' habitat. *The Aransas Project v. Shaw et al*., 930 F. Supp. 2d 716, 786-88 (S.D. Tex. 2013).

On March 15th, then Texas Attorney General Greg Abbott (now Texas Governor) requested that the federal district court suspend its order. The motions by Attorney General Abbott and GBRA were denied, and the District Court's order was appealed on an emergency basis. On March 26, 2013, the US Fifth Circuit Court of Appeals granted a stay of the District Court's ruling. With the stay in place, TCEQ was able to resume issuing water permits in the Guadalupe and San Antonio Rivers. On June 30, 2014, a three-judge panel of the Fifth Circuit unanimously overturned Judge Jack's ruling — agreeing with defendants that the plaintiff TAP failed to prove its case. Following a Fifth Circuit three-judge panel's unanimous reversal of Judge Jack's decision, the Fifth Circuit denied a Petition for Rehearing En Banc (rehearing of all Fifth Circuit judges) requested by TAP in December 2014. The US Supreme Court denied an appeal in *TAP v. Shaw, et al.* on June 22, 2015, and as a result the defendants in the case prevailed and the litigation finally came to an end. GBRA eventually bore $8 million in associated fees. The overall costs of the litigation to all the parties likely exceeded $12 million.

Table 1: Timeline

2008 - 2009 Whooping Crane Deaths (4 known)
2011 - *TAP v. Shaw et al.* Filed
2013 (March) - US District Court Decision in TAP's Favor
2013 (March) - US Fifth Circuit Court of Appeals issues stay in *TAP vs. Shaw et al*.
2014 (June) - US Fifth Circuit Rules in Defendant's Favor
2015 (June) - US Supreme Court Refuses Review *TAP v. Shaw et al.*
2015 (October) - US Fish and Wildlife Service (USFWS) Responses to Congress as Part of Congressional Oversight Hearing
2016 (January) – GBRA and TAP Begin Discussions
2016 (February) - GBRA and TAP Sign Initial Agreement to Collaborate
2016 (November) - GBRA and TAP Sign Revised Agreement to Collaborate
2017 (April) – The Cynthia and George Mitchell Foundation Provides Grant to Develop GBRA & TAP Stakeholder Process

Environmental Flows in Texas

Because many streams in Texas are fully or almost fully appropriated, opportunities are very limited for making new water appropriations for the environment or for new water development projects that alone would provide flows sufficient to maintain a healthy ecosystem. In most cases in Texas, water rights issued before 1985 have no environmental requirements at all. Beginning in 1985, the Texas Legislature passed bills to develop, manage, and preserve the water resources of the state and protect instream and freshwater inflows to bays and estuaries. In 2007, one of these bills established the Environmental Flows Advisory Group and the Science Advisory Committee and required the TCEQ to adopt rules related to environmental flows (House Bill 3 and Senate Bill 3, 80th Texas Legislature, 2007).

With the passage of the 2007 legislation Texas now defines an environmental flow as an amount of water that should remain in a stream or river for the benefit of the environment of the river, bay, and estuary, while balancing human needs. "Environmental flow regime" is defined as "a schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by specific location in a watershed, and that are shown to be adequate to support a sound ecological environment and to maintain the productivity, extent, and persistence of key aquatic habitats in and along the affected water bodies." (Title 2, Texas Water Code, Section 11.002.16).

On August 8, 2012, before the US District Court ruled in *TAP vs. Shaw et al*., TCEQ adopted environmental flow standards for the Guadalupe River Basin and San Antonio Bay. These rules can be found at: www.tceq.texas.gov/assets/public/legal/rules/rules/pdflib/298e.pdf.

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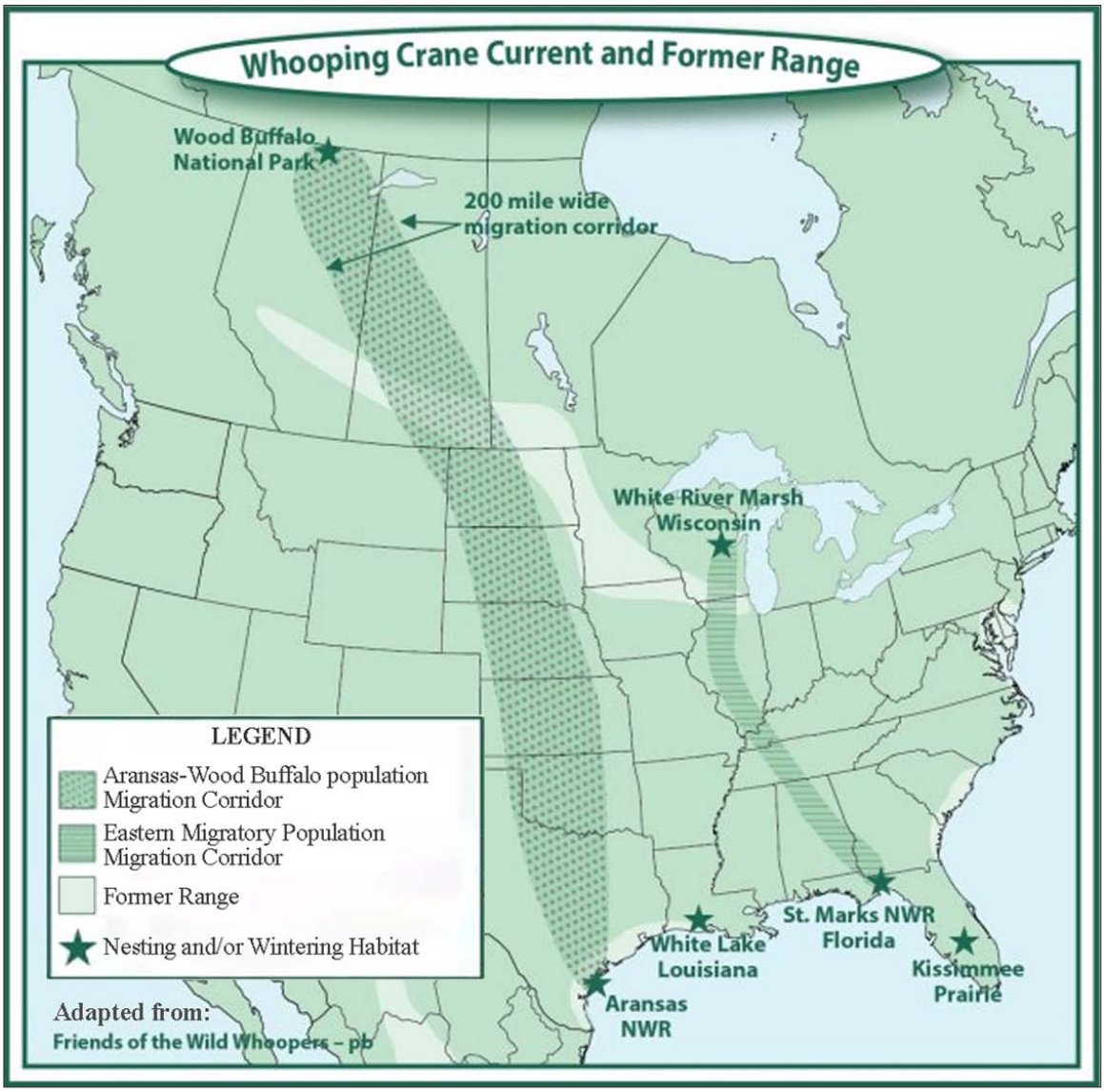
Texas Water Dispute Resolution

Migration Corridors



Crane Populations

Whooping Cranes in Texas

The key remaining population of whooping cranes is the Aransas-Wood Buffalo flock, consisting of some 329 birds in 2016. The flock flies south 2,500 miles each fall from their breeding grounds in Canada's Wood Buffalo National Park in Alberta and the Northwest Territories to winter along the Texas coast, primarily at the Aransas National Wildlife Refuge on San Antonio Bay. The flock flies north 2,500 miles in the spring to return to Canada. The Guadalupe River provides the majority of freshwater inflow to San Antonio Bay. The whooping crane population was estimated at a mere 15 in 1941. The population of the Aransas-Wood Buffalo Flock has increased on average 3.5% annually from 1950-1951 to 2010-2011 (Butler, M.J., B.N. Strobel, and C. Eichhorn. 2014. *Whooping crane winter abundance survey protocol: Aransas National Wildlife Refuge*. Survey Identification Number: FF02RTAR00-0002. U.S. Fish and Wildlife Service, Austwell, Texas, USA, available at: http://do.doi.org/10.7944/W3159J at 82). The population has continued to increase since 2011.

Table 2: 2016 Whooping Crane Population Summary

- 329 Aransas-Wood Buffalo Migratory Flock
- 14 Florida Non-Migratory Flock
- 99 Eastern Migratory Flock
- 201 Captive Flocks
- 57 Louisiana Non-Migratory Flock

Source: Wade Harrell, USFWS, 2017.

Texas Water Dispute Resolution

After the US Supreme Court denied TAP's appeal in 2015, Congress held a hearing regarding the ESA. The oversight hearing on "Federal Agencies' Selective Enforcement of ESA Consultation" on July 29, 2015, was not specifically about *TAP vs. Shaw et al*. However, as part of that hearing Chairman Rob Bishop provided USFWS with a number of questions for the record, including the following questions regarding whooping cranes:

Crane Mortality

Questions: The Fish and Wildlife Service (Service) has correctly recognized that the data collection methods it utilized to collect whooping crane population information and mortality rates at the Aransas National Wildlife Refuge during the winter of 2008 and 2009 were deficient. To address data collection issues it has now instituted the Whooping Crane Winter Abundance Survey protocol. What is the Service's official position on whooping crane mortality at the Aransas National Wildlife Refuge during the winter of 2008 and 2009? What is the most current estimate of the whooping crane population at the Aransas National Wildlife Refuge?

Updated Methodology

Response: In a 2008-2009 publication, the Service's Southwest region reported what we believe to have been a loss of 23 whooping cranes, using the best information available at that time. Following the retirement of the Service's Whooping Crane Coordinator in 2011, a team of specialists was formed to evaluate our process for estimating the whooping crane population. After an extensive interview, the team updated the methodology used for estimating whooping crane abundance. Use of this scientifically sound methodology has improved our knowledge and understanding of this whooping crane population and will aid in conservation planning, future policy decisions and the long-term conservation of this species for the American public. However the Service is unable to confirm the loss of whooping cranes previously reported in 2008-2009, because data could not be verified using the previous methodology. Therefore the number of whooping cranes that died at the Aransas National Wildlife Refuge during the winter of 2008-2009 remains unknown.

The Aransas-Wood Buffalo population of whooping cranes in the winter of 2014-2015 was estimated at 308 individuals.

Please see the following peer reviewed publications for further details:
http://ecos.fws.gov/ServCatFiles/reference/holding/28257
http://www.sciencedirect.com/science/article/pii/S0006320714003115

(Responses to Questions for Michael Bean, Principal Deputy Assistant Secretary for Fish and Wildlife and Parks, US Department of the Interior from Chairman Rob Bishop, Committee on Natural Resources as part of the oversight hearings on "Federal Agencies' Selective Enforcement of ESA Consultation," July 29, 2015, Washington, D.C., October 27, 2015, page 5).

Habitat Key

The USFWS' response to Congress has guided GBRA's primary focus on habitat as the key to providing for the needs of the expanding whooping crane flock. The 2015 response to Chairman Bishop by USFWS directs the Committee to the new counting methodology for wintering whooping cranes based on established protocols and the scientific method (Butler, M.J., B.N. Strobel, and C. Eichhorn. 2014. *Whooping crane winter abundance survey protocol: Aransas National Wildlife Refuge*. Survey Identification Number: FF02RTAR00-0002. US Fish and Wildlife Service, Austwell, Texas, USA http://do.doi.org/10.7944/W3159J). The response also refers Congress to an article published in 2014 by the journal Biological Conservation (Matthew J. Butler, Kristine L. Metzger, Grant Harris, "Whooping crane demographic responses to winter drought focus conservation strategies", Biological Conservation, 179 (2014) 72-85). The article was written by three USFWS biologists and concludes:

Drought Impacts Limited

By placing winter mortality in an annual context, we identified that winter drought has little influence on this population's recovery. Therefore, on the wintering grounds in Texas, conservation and management priorities should focus on maintaining and protecting coastal, upland, and interior habitats for whooping cranes to use, given the wide range of climatic conditions that cranes experience. Such actions will ensure that enough, sustainable habitat exists to support this expanding population of whooping cranes.

Texas Water Dispute Resolution

Edwards Aquifer Litigation

Collaboration

Habitat Conservation Plan

Conservation Easements & Sea Level Rise

Down-Listing Species

Issues

THE EDWARDS AQUIFER RECOVERY IMPLEMENTATION PROGRAM

PAVING THE WAY FOR GBRA & TAP AGREEMENT

While the *TAP* litigation was in progress the stage was being set for the resolution of future ESA conflicts through the resolution of the longest standing water and ESA conflict in the region. The use of the Edwards Aquifer had inspired decades of regional antagonism and open conflict in courts and the Texas Legislature. It was a seemingly intractable dispute between and among municipalities, industrial and agricultural users, as well as, environmental interests, and downstream surface right holders on the Guadalupe River. All of those stakeholders — dependent on springflows — focused on the question of whether pumping from the Edwards Aquifer should be regulated, and if so, how it should be regulated.

In the early 1990s, the Sierra Club, GBRA and others brought state regulation to the Edwards Aquifer and ended unrestricted withdrawals through the use of the ESA in a lawsuit that the *TAP v. Shaw et al.* litigation was modeled after, *Sierra Club v. Babbitt et al.*, Case No. MO-91-CA-069, 995 F.2d 571(1993). In 2006-2007, the USFWS and the Texas Legislature brought together stakeholders from throughout the region to participate in a unique collaborative process to develop a plan to contribute to the recovery of federally-listed species dependent on the Edwards Aquifer. This process was referred to as the Edwards Aquifer Recovery Implementation Program or EARIP (*see* Gully & Votteler, *TWR* #58).

By the end of 2011, a stakeholder committee of 26 individuals representing numerous interests had come together to create the Edwards Aquifer Habitat Conservation Plan (EAHCP). The Plan was endorsed by the Edwards Aquifer Authority Board of Directors in December 2011 (after initially failing to do so earlier that same month). The EAHCP was then approved by USFWS and a Record of Decision was issued on February 15, 2013. This process cleared the path for the resolution of other conflicts downstream of the Comal and San Marcos Springs, within the Guadalupe River Basin, by demonstrating to the region what could be achieved by stakeholders who were committed to working through a process to obtain a compromise that they can all accept (Gully & Votteler, *TWR* #124).

WATER WETLANDS WATERFOWL WHOOPING CRANES PROPOSAL (WWWWCP)

In 2015, after the US Supreme Court's denial of TAP's appeal and prior to any discussions between GBRA and TAP, GBRA developed an outline for coastal habitat restoration and conservation project to conserve wetlands, whooping cranes, and waterfowl, while supporting local agriculture (Todd Votteler, *Water, Wetlands, Waterfowl, Whooping Cranes and Rice: A Proposal by the Guadalupe-Blanco River Authority*, July 17, 2015). The premise of the WWWWCP was to preserve rural land already in farming, primarily through conservation easements. The preserved land could become the future wetlands for whooping cranes and waterfowl habitat with sea level rise expected in the future. This effort sought to assist a USFWS initiative to protect 125,000 acres of additional habitat along the mid-Texas coast from Corpus Christi to Baytown that could support the expanding population of wintering whooping cranes. The WWWWCP goal was to support the recovery of whooping cranes for down-listing from endangered to threatened. One of the scenarios for the whooping crane to be downlisted from endangered to threatened under the USFWS International Recovery Plan is that the Aransas-Wood Buffalo flock must self-sustain and maintain a population of at least 1,000 individuals (250 productive pairs) (Canadian Wildlife Service and USFWS. 2007. *International Recovery Plan for the Whooping Crane* (*Grus americana*), third revision Environment Canada, Ottawa and USFWS, Albuquerque, New Mexico, xii). Thus far, some of the 125,000-acre habitat goal has been met by various organizations. GBRA believed that in the aftermath of *TAP v. Shaw et al.* there was a potential to create a project with multiple partners that addresses a number of issues facing the mid-coast of Texas.

Issues to be addressed by WWWWCP included:

- Potential reductions in freshwater inflows during prolonged droughts
- Loss of wetlands and their associated benefits
- Declines in wintering waterfowl populations in Texas and impacts to Texas hunters and birders
- Declining wintering habitat for the steadily growing Aransas-Wood Buffalo Whooping Crane flock
- Reductions in the rice industry due to lack of water availability during drought or increased prices for water

Phase 1 was to occur in the Guadalupe River Basin. This phase would also have served as a pilot project for additional future phases on the Colorado and Brazos River Basins, if stakeholders in those basins decided to participate where there is the potential for the preservation of future habitat as the cranes expanded their wintering grounds up the coast. GBRA began meeting with key stakeholders regarding WWWWCP shortly before the discussions with TAP began.

Texas Water Dispute Resolution

Lunchtime Genesis

Focus Points

Habitat Improvement

Water Supply

Market-Based Solutions

Implementation Plan

GBRA & TAP AGREEMENT 1

The collaboration between GBRA and TAP began as the result of an impromptu lunch meeting between former GBRA General Manager Bill West and TAP attorney and Board Member Jim Blackburn in January 2016. After this meeting, Blackburn promptly withdrew TAP's opposition to a surface water right application for the GBRA Mid Basin Project that was pending before the TCEQ. This action signaled to GBRA the seriousness of TAP's commitment to work together. Formal discussions between the GBRA and TAP quickly followed. GBRA shared the WWWWCP concept with TAP and within a few weeks a new product emerged — a white paper outlining areas of mutual interest and potential cooperation. "*White Paper: Water, Habitat, Economy — A Shared Vision of the Future for the Guadalupe River System and San Antonio Bay*" (White Paper).

The White Paper included ten specific points of focus:

1) Water Re-Allocation and Management
2) The True Value of Water
3) Market Based Mechanisms to Provide Additional Base Flow Generated Through Watershed Improvements
4) Climate Change — The Potential for Droughts More Severe and Prolonged Than the Drought of Record
5) Sea Level Rise
6) Guadalupe River Delta Preservation and Restoration
7) Whooping Crane Habitat
8) Sea Turtle Habitat
9) Freshwater Mussels
10) Marine Seawater and Brackish Groundwater Desalination

On February 24, 2016, Bill West and Jim Blackburn signed the White Paper agreement at the Meadows Center for Water and the Environment at Texas State University, in front of the symbolic San Marcos Springs, in San Marcos, Texas.

GBRA & TAP AGREEMENT 2

In May 2016, a new General Manager and Chief Executive Officer, Kevin Patteson, started at GBRA. Under Patteson, the GBRA and TAP agreement was reaffirmed and enhanced in a revised agreement: "*Affirmation and Restructuring of the Shared Vision for the Guadalupe River System and San Antonio Bay*" (*Affirmation and Restructuring*). In the revised agreement the ten study and collaboration areas identified above (under the February agreement) were condensed into two major and more manageable topic areas — with habitat improvement as the first priority, and secondly water management. Under the habitat section, issues such as land stewardship, the future of the Guadalupe River Delta, new territories for wintering cranes, river mussel requirements, and habitat improvement throughout the watershed will be studied along with review of the concept for protecting a nursery zone within San Antonio Bay:

> Relative to bay habitat, the potential creation of a low-flow sanctuary in the upper half of San Antonio Bay will be evaluated as a nursery for blue crab and other juvenile species. Among other issues, the need for and/or availability of minimal inflows to maintain this nursery reserve area will be evaluated.

(*Affirmation and Restructuring*, November 29, 2016, Page 3-4).

Under the water supply work, the water allocation model for the watershed will be reviewed as will all existing permits. Consideration of creative concepts such as water pricing and alternative supply development, permit conditions, and water supply enhancement techniques. Water is the more difficult issue within this agreement and will require more time and money than habitat stewardship. The work will be undertaken with the assistance of stakeholder groups comprised of interested entities and individuals focusing on the development of market based solutions.

As the preamble of the revised agreement states:

> If we are successful under the process set out in this white paper, GBRA and TAP, with the assistance of vested stakeholders, will create an action plan for ensuring water supply, a healthy bay and protected endangered species, including whooping cranes and mussels. We believe that hard work, creativity and openness will give us the ability to solve what may seem initially to be an impossible task.

(*Affirmation and Restructuring*, November 29, 2016, Page 3-4).

The Work is Finally Beginning

To assist in this planning effort under the agreement, GBRA and TAP have received funding from The Cynthia and George Mitchell Foundation to develop an action plan for implementation. The goal is to develop an action plan for advancing implementation of the shared vision agreement before the end of 2017. The plan will outline priorities, actions, responsible entities, and steps needed to begin implementing the agreement.

Texas Water Dispute Resolution

Stored Water Purchase

Rare Mussels

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Potential action plan topics may include:

1) Prioritized and sequenced research and collaboration actions related to habitat and water, estimated resource requirements, and strategies for securing them
2) Governance structures for guiding implementation of the action plan and agreement
3) Mechanisms and processes for ensuring effective coordination of implementation activities and partners
4) Accountability systems for monitoring implementation progress, among other topics

EFFORTS THAT COMPLIMENT THE GBRA & TAP AGREEMENT

PURCHASE & STORAGE

In 2015, Ducks Unlimited, Harte Research Institute, Meadows Center for Water and the Environment, National Wildlife Federation, and The Nature Conservancy came together to form the Texas Environmental Flows (The Working Group). The Working Group's aim is to build the body of work — scientific, technical, and regulatory — needed to set the stage for successful voluntary and negotiated water transactions to increase, restore, and protect environmental flows in targeted bay systems along the Texas Gulf Coast. The Working Group seeks, by the end of 2018, to have executed one or two water transactions to benefit at least one of the following bay and estuary systems: Galveston, Matagorda, and San Antonio.

One potential transaction of great significance is the purchase of stored surface water for release during droughts to augment existing freshwater inflows to San Antonio Bay. GBRA and Dow Chemical Company (Dow), individually and collectively, own surface water rights in the lower Guadalupe – San Antonio River Basin (the GBRA/Dow Water Rights) authorizing diversions from the run-of-river flow of the Guadalupe River totaling 175,501 acre-feet per year.

To firm up the run-of-river supplies of water available under the GBRA/Dow Water Rights, GBRA is considering constructing an off-channel reservoir near the GBRA Main Canal and Dow Seadrift Operations facilities. GBRA anticipates the off-channel reservoir would, in its initial configuration, likely have a water depth of about 25 feet and be capable of impounding approximately 12,500 acre-feet of water. A pressure pipeline would transport water diverted from the GBRA Main Canal to the reservoir site and a gravity outlet pipeline would return stored water to the GBRA Main Canal. Given that the GBRA/Dow Water Rights point of diversion near Tivoli is below the San Antonio River confluence and that the rights are senior in priority to most upstream water rights in both the Guadalupe and San Antonio Rivers, it is recognized that these water rights are quite reliable but not entirely firm.

DEVELOPING ESA ISSUE

POSSIBLE FOCUS OF THE GBRA & TAP AGREEMENT

In 2007 and 2008, WildEarth Guardians petitioned the USFWS to list numerous freshwater mussels found in the Southwest, including nine Texas species, under the ESA. In November 2009, the Texas Parks and Wildlife Department placed 15 Texas freshwater mussels on the State Threatened List. In December 2009, USFWS issued a finding that listing may be warranted for the nine Texas mussels included in the 2007 and 2008 WildEarth Guardian petitions and initiated a status review. In October 2010, USFWS issued a 12-month finding that listing of five Central Texas freshwater mussel species is warranted and added them to the candidate species list.

The rare mussels that occur in the Guadalupe River are: the Texas fatmucket (Lampsilis bracteata); Texas fawnfoot (Truncilla macrodon); Texas pimpleback (Quadrula petrina); and the False spike (Fusconaia mitchelli). The USFWS will be making a determination whether these freshwater species of mussels warrant protection under the ESA (Letter from Adam Zerrenner, USFWS to Todd Votteler, GBRA, March 1, 2017). The False spike already has a positive finding regarding listing. USFWS states that the Texas fatmucket, Texas fawnfoot, and Texas pimpleback face the following primary threats: impoundments; sedimentation; habitat loss; and riverbank destabilization. *Id*.

CONCLUSIONS

Nothing quite like the opportunity provided under the GBRA and TAP agreement has ever existed in Texas. Nevertheless, it will be difficult to implement given the issues, numerous stakeholders, and pitfalls. If successful, however, it will be a model for many river basins within the state, all of which struggle to address similar issues of providing adequate water supply and meeting the needs of the estuarine ecological system. The bitter memory of *TAP vs Shaw et al.* is still fresh in the minds of those who participated as well as many outside observers. Should GBRA and TAP be able to reach lasting results, the memory of the conflict will fade and the legacy of the achievement shall endure.

For Additional Information:

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White Paper available at: www.gbra.org/news/2016/022401.aspx

WATERSHED ASSESSMENT & PLANNING

USING HYDROLOGIC AND BIOLOGIC CONDITION ASSESSMENT TO IMPROVE STREAM HEALTH
A PUGET SOUND REGION EXAMPLE

by Robin Kirschbaum, Robin Kirschbaum, Inc. (RKI), (Seattle, WA)

Watershed Assessment

Lost Forest & Urban Infill

Stormwater Sources

Watershed is "…the area of land that contributes runoff to a lake, river, stream, wetland, estuary, or bay." (EPA 2008)

Watershed Analysis

Regulations

INTRODUCTION: PROBLEM STATEMENT

The loss of forest cover and associated increase in impervious area under current levels of development has significantly altered the hydrology of many Puget Sound Lowland streams. When unmitigated, these hydrologic alterations, including increased winter peak flows and decreased winter base flows, are linked with greater frequency and magnitude of flooding and channel erosion (Booth and Jackson, 1997; Konrad et al., 2005) and reduced biologic, or biotic, integrity of streams (DeGasperi et al., 2009; Karr et al., 1986).

With approximately 5,000,000 people expected to live in the Puget Sound region by 2040, increased urban infill development is a core tactic used by the Regional Growth Strategy to comply with the Washington State Growth Management Act (PSRC 2009). Development standards across the Puget Sound, and the entire western Washington region, require Low Impact Development (LID) to reduce impervious surfaces, loss of vegetation, and stormwater runoff associated with new and redevelopment projects. Never the less, the anticipated aggressive urban infill plans will exert more pressure on the region's already degraded streams.

Federal regulations, such as the Water Pollution Control Act of 1966 and the Clean Water Act of 1972, have sought to restore and maintain the integrity of the nation's water resources. Much progress has been made to prevent water pollution from "point sources" — such as municipal or industrial end-of-pipe discharge points. However, available water quality data indicates that a significant number of waterways are not meeting the state Water Quality Standards set to protect beneficial uses. "Nonpoint" pollution associated with diffuse stormwater runoff from roads, farms, forest lands, and other sources remains the largest challenge in complying with the Water Quality Standards (Ecology 2015).

While the goal of the Clean Water Act is to "to restore and maintain the chemical, physical, and biological integrity of the nation's waters" (Section 101 [a]), only recently has there been an accepted analytical framework for assessing biotic integrity. To date, efforts have largely focused on hydrologic or water quality impairment, with less direct measurement and assessment of habitat and the ability of streams to sustain a healthy biological community (Karr et al. 1986).

Watershed Planning Solutions

Like any planning process, effective watershed planning provides clearly defined goals and objectives, well-designed strategies to achieve them, clear implementation and monitoring work plans, and flexibility to be adapted when problems persist. Because of variability in the factors that drive the planning process — such as the size of the watershed, local geology and climate, degree of urbanization, and the specific underlying issues that contribute to degradation — a "one size fits all approach" to watershed planning is not practical. Instead, an analytic framework is needed that can be applied consistently across various watersheds by the different jurisdictions and basin partners involved to help achieve local and common regional goals for stream protection. The framework should integrate hydrologic, chemical, and biological assessment to understand how and where stream health has been impacted the most and what types of solutions would be most effective.

Purpose of this Article

This article presents an overview of relevant federal and state regulatory requirements, provides a general analytic framework for the watershed planning process, and reviews techniques for hydrologic and biologic assessment that can be integrated into the analysis of existing and target conditions.

REGULATORY REQUIREMENTS

Several regulations pertinent to watershed planning in Washington State include the Washington State Growth Management Act (GMA), the federal Clean Water Act (CWA) framework, and the CWA's National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II Municipal Stormwater Permit program — which is administered in Washington State by the state's Department of Ecology (Ecology).

Not all watershed planning is performed in response to regulatory requirements. Many jurisdictions conduct watershed planning voluntarily, to strategically retrofit stormwater and LID facilities into the built environment and accelerate the pace of stream protection and restoration in the highest priority watersheds (Commerce 2016).

Watershed Assessment

Urban Growth

Growth Management Act

Washington State's GMA requires state and local governments to manage growth by: identifying and protecting critical areas and natural resource lands; designating urban growth areas; and preparing and implementing comprehensive plans through capital investments and development regulations. Adopted by the Legislature in 1990, the GMA seeks to reduce the threat to the environment, economy, and quality of life in Washington posed by uncoordinated and unplanned growth.

Broad goals of the GMA include:

- Managing urban growth;
- Protecting agricultural, forestry, and environmentally sensitive areas;
- Protecting property rights; and
- Reducing sprawl; and encouraging efficient multimodal transportation systems.

VISION 2040

VISION 2040, developed by the Puget Sound Regional Council (PSRC 2008), provides a regional strategy for achieving these goals that will be implemented through local comprehensive and agency plans. A key strategy of *VISION 2040* is to increase the pace of urban infill development. This strategy — while helping to address certain land use challenges — will exert further pressure on already impaired streams and will need to be mitigated by more abundant and more strategic stormwater management controls.

Clean Water Act

The CWA (33 U.S.C. §1251 et seq. (1972)) provides the framework for regulating discharges of pollutants into the waters of the United States and regulating water quality standards for surface waters. The objective of the CWA is to "to restore and maintain the chemical, physical, and biological integrity of the nation's waters" (Section 101 [a]).

NPDES Phase I Municipal Stormwater Permit Requirements

Watershed-Scale Planning

Ecology's National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Stormwater Permit — effective August 1, 2013 through July 31, 2018, and modified August 19, 2016 (Permit) — requires Clark County, King County, Pierce County, and Snohomish County to conduct watershed-scale stormwater planning under S5.C.5.c. The objective of watershed-scale stormwater planning is to identify a stormwater management strategy or strategies that would result in hydrologic and water quality conditions that fully support "existing uses" and "designated uses" (as defined in the Washington Administrative Code (WAC) 173-201A- 020) throughout the stream system.

Planning Requirement

The County Permittees are required to select one watershed in which to conduct watershed-scale stormwater planning. The watershed may be selected from a prescribed list, or an alternative watershed that meets all of the following criteria may be selected:

1) has a drainage area of at least ten square miles;
2) is partially or wholly within the county Permittee's existing Municipal Separated Storm Sewer System (MS4) service area with discharges to the stream;
3) has a stream system that has been impacted by development but retains some anadromous fish resources; and
4) is targeted to accept significant population growth and associated development, and is partially, if not fully, within the urban growth area established under Chapter 36.70A Revised Code of Washington (RCW), or a potential future expansion of the urban growth area.

A City or County MS4 Permittee within a selected basin must fully participate with the stormwater planning process, either in coordination with other Permittees in the selected watersheds, or independently.

The scope of work must include an existing conditions assessment that uses, among other items, macroinvertebrate data for the purpose of estimating current Benthic Index of Biotic Integrity (B-IBI) scores and comparing them with the scores predicted by the existing values of the hydrologic metrics in S5.C.5.c.iv(4). A calibrated hydrologic model must be developed and used to estimate hydrologic changes from the historic condition and predict future hydrologic, biologic, and water quality conditions at full build-out under existing or proposed comprehensive land use management plan(s) for the watershed. Future biologic conditions shall be estimated by using a correlation of hydrologic metrics with B-IBI scores for Puget Sound Lowland Streams (DeGasperi et al. 2009).

The desired outcome is a set of recommended stormwater actions, including (Ecology 2017):

- Adjustments to designated or allowed land uses;
- Building code requirements; and
- Locations and types of capital projects.

NPDES Phase I and II Municipal Stormwater Permit Reissuance

Ecology is currently identifying issues and improvements needed for the forthcoming 2018 NPDES Phase I and Phase II Municipal Stormwater Permit reissuance. Among the many issues identified is the need to develop watershed planning and stormwater retrofit requirements.

Watershed planning is "…a means to resolve and prevent water quality problems that result from both point source and nonpoint source problems… [They] are intended both to provide an analytic framework to restore water quality in impaired waters and to protect water quality in other waters adversely affected or threatened by point source and nonpoint source pollution." *Handbook for Developing Watershed Plans to Restore Our Waters* (EPA 2008)

Watershed Assessment

EPA Retrofit Push

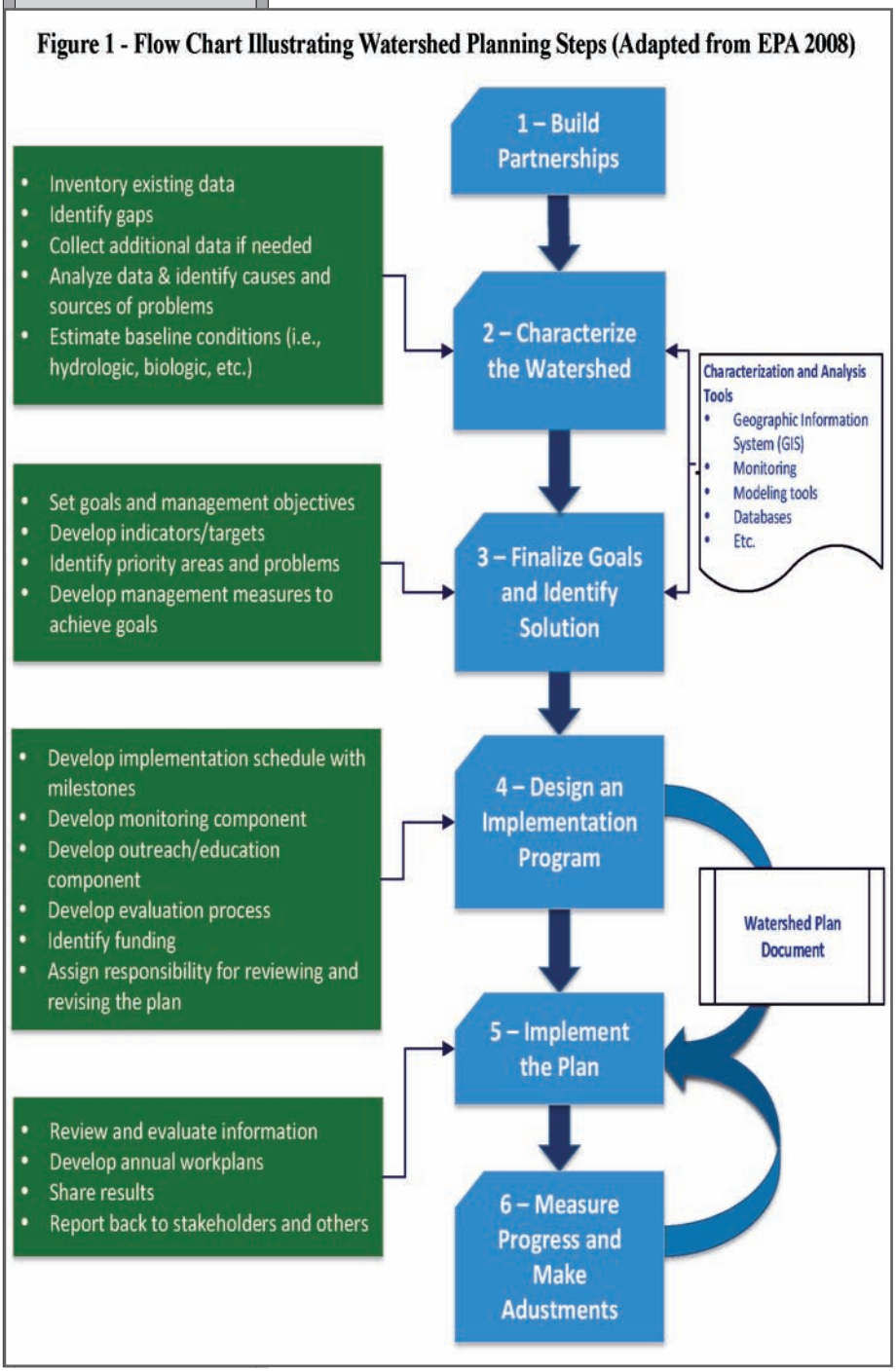
The US Environmental Protection Agency (EPA) sent a letter to Ecology, dated October 6, 2016, regarding the EPA's early input on the 2018 Permit Reissuance (EPA 2016). The EPA recommended that Phase I and Phase II Permittees above an appropriate, to-be-determined population threshold be required to implement a stormwater retrofit program.

EPA recommended that the program include:

- Identification of high priority basins/outfalls for retrofitting;
- A list of prioritized projects;
- A list of projects to be completed within a five-year permit cycle; and
- An accounting of jurisdiction and grant expenditures.

The letter further recommended inter-jurisdiction coordination within watersheds and references broader watershed scale (e.g., Water Resource Inventory Area (WRIA)) plans, such as salmon recovery plans. *Building Cities in the Rain* (Commerce 2016) is recommended as a possible guide to be used by local jurisdiction planning efforts.

Figure 1 - Flow Chart Illustrating Watershed Planning Steps (Adapted from EPA 2008)



METHODS

Overview of Watershed Planning Process

EPA's Handbook for Developing Watershed Plans to Restore and Protect Our Waters (EPA 2008, Handbook) provides the following six basic steps for watershed planning and implementation:

1) Build Partnerships

2) Characterize the Watershed

3) Set Goals and Identify Solutions

4) Design an Implementation Program

5) Implement the Plan

6) Measure Progress and Make Adjustments

These steps provide a general framework that can be adapted as appropriate to a given watershed. The specific actions needed to accomplish those steps will vary from place to place. For example, the composition and priorities of the interested stakeholder groups would affect how partnerships are built, while the local and regional goals and available data and tools (i.e., calibrated models; long-term records of streamflow; B-IBI scores; presence or absence of salmonids, etc.) would affect the steps taken to characterize the watershed. Figure 1 provides a flow chart illustrating the basic steps including activities and outputs that may be associated with each.

Watershed Assessment

Flow Trends

Changing Patterns

High Pulse Events

Assessing Hydrologic Alteration

The hydrology of urbanizing basins has a significant influence on the biotic integrity of streams. Understanding trends in the timing and magnitude of peak high flows and low flows and the variance of these values over time and space is critically important for making informed decisions regarding watershed management.

Many modeling and hydrologic assessment tools are available for analyzing long-term timeseries of streamflow (measured or modeled) to assess indicators and patterns of hydrologic alteration. One such software, *Indicators of Hydrologic Alteration* (IHA), developed by The Nature Conservancy (TNC 2009), calculates ecologically relevant hydrologic parameters based on input daily measured or modeled streamflow records. The software first calculates the timing and maximum flow of each year's largest flood or lowest flows, then calculates the mean and variance of these values over some period of time. Statistical analysis can then help describe how these patterns have changed and whether those changes are associated with abrupt impacts (e.g. dam construction), or more gradual trends (e.g. land and water use changes).

Figure 2 compares daily hydrographs for Miller Creek (Gauge #42a) and Issaquah Creek (Gauge #46a), downloaded from King County's Hydrologic Information Center website (2017) for demonstration purposes. These datasets were selected because they represent a range between "very poor" (Miller Creek) and "good" (Issaquah Creek) B-IBI scores. The data were analyzed in IHA to parse flow levels between extreme low flow, low flow, high flow pulse, and small flood using the software's default parameters. The parsed data can be used to calculate dozens of hydrologic metrics, including High Pulse Count (HPC) and High Pulse Range (HPR), and measure the frequency and period of time each year that high pulse events occur, which have been found to be highly correlated with B-IBI (DeGasperi et al. 2009).

Figure 2 – Example IHA Output for Issaquah Creek (Gauge #46a) and Miller Creek (Gauge #42a) for Water Years 2014-2016. Data downloaded from http://green2.kingcounty.gov/hydrology/Data.aspx

Watershed Assessment

High & Low Pulse Values

Table 1 provides a summary comparison of calculated low and high pulse values for two periods: 1988 to 2006 and 2007 to present. The break in year 2007 was selected for this demonstration to compare the previous and current Permit cycle against earlier cycles. As shown in the data, the average frequency of low pulses decreased for Issaquah Creek, while the duration of those pulses increased between the two periods of time compared. The average frequency of low pulses also decreased for Miller Creek, but the duration of low pulses did not change significantly between the two periods. For Issaquah Creek, the frequency and duration of high pulses increased significantly, while the high pulse frequency did not increase significantly for Miller Creek between the two periods analyzed.

Table 1 – Calculated High Pulse Count (HPC) and High Pulse Range (HPR) for Issaquah Creek and Miller Creek, comparing periods 1988 to 2006 and 2007 to present

Creek	Period 1 - 1988-2006	Period 2 - 2007-2017	Change
Issaquah Creek (King County Gauge #46a)			
Low pulse count (#/WY)	7.05	5.36	-1.69 / -24%
Low pulse duration (days/WY)	14.23	16.50	2.31 / 16%
High pulse count (#/WY)	7.47	9.64	2.16 / 29%
High pulse duration (days/WY)	3.96	13.98	10.02 / 253%
Low Pulse Threshold (cfs)	1.50	N/A	N/A
High Pulse Threshold (cfs)	16.48	N/A	N/A
Miller Creek (King County Gauge #42a)			
Low pulse count (#/year)	11.42	7.18	-4.24 / -37%
Low pulse duration (days/WY)	8.93	8.83	-0.11 / -1%
High pulse count (#/year)	10.42	10.45	0.03 / 0%
High pulse duration (days/WY)	2.37	18.91	16.55 / 700%
Low Pulse Threshold (cfs)	2.03	N/A	N/A
High Pulse Threshold (cfs)	20.23	N/A	N/A

- cfs: **c**ubic **f**eet per **s**econd
- N/A: Not applicable
- WY: Water Year

Stormwater Linkage

Statistics such as these can be used to calculate B-IBI scores when biological monitoring data are not available, or can be used to compare with the available monitoring B-IBI data to understand the linkage between stormwater management, hydrology, water quality, and biologic integrity of the stream. Horner (2013) developed regression equations relating B-IBI to HPC and HPR including 90-percent confidence bounds. Table 2 provides the regression equations, which have R2 values of 0.745 when computed using the HPC regression equation and 0.755 when computed using the HPR regression equation.

Table 2 – Regression Equations Relating Calculated B-IBI Score to HPC and HPR[a]

Confidence Limit	Regression Equation Parameters b	HPC Regression Equation b R2 = 0.745		HPR Regression Equation b R2 = 0.755	
		Lower Confidence Bound	Upper Confidence Bound	Lower Confidence Bound	Upper Confidence Bound
90%	a	-0.084	-0.048	-0.007	-0.004
	b	4.29	4.71	4.44	4.95
80%	a	-0.08	-0.052	-0.006	-0.004
	b	4.34	4.66	4.5	4.89
60%	a	-0.075	-0.057	-0.006	-0.004
	b	4.39	4.6	4.57	4.82

Source: Horner (2013)

- Equation: Ln (% Max. B-IBI Score) = a*HPC + b
- Ln: signifies the natural logarithm
- R2 represents the fraction of variability in a data set explained by the statistical model. Both regressions are significant at $P < 0.001$.

Watershed Assessment

Table 3 compares calculated B-IBI scores for 90% and 60% confidence intervals for HPC ranging between 2 and 20 pulses per water year.

Table 3 – Calculated B-IBI scores for HPC between 5 and 20 pulses per water year, including low and high confidence bounds for 90% and 60% confidence intervals[a]

HPC (#/WY)	90% Confidence Interval		60% Confidence Interval	
	Lower Confidence Bound	Upper Confidence Bound	Lower Confidence Bound	Upper Confidence Bound
2	62	79	69	79
5	48	65	55	65
10	31.5	46.5	38	47
15	20.7	33.4	26	33
20	13.6	24	18	24

Source: Horner (2013).

- HPC: High Pulse Count.
- WY: Water Year.

Inherent Uncertainty

As shown in the table, the regression equations indicate that attaining B-IBI scores of "good" (e.g., B-IBI > 60) can be anticipated only with the very lowest levels of HPC (i.e., ≤ 5 high pulse events per water year). Even then, there is less than 60% confidence that these goals would actually be achieved within the lower confidence bound.

This information can help inform planning decisions by demonstrating the uncertainty inherent in the underlying data and the equations that are based on that data. The range of possible outcomes can be assessed by applying the regression equations for best and worst-case estimates, and also with different confidence intervals, to help inform decisions (Horner 2013).

Biological Conditions

Assessing Biologic Alteration

The B-IBI scoring system is a standardized system for monitoring, assessing, and comparing the biological condition of streams (Puget Sound Stream Benthos 2017). There are various forms of the B-IBI system, but the Puget Sound Lowlands B-IBI system is the default requirement of the Permit unless a different method is approved by Ecology. The Puget Sound Lowlands method can calculate B-IBI scores three different ways based on the taxonomic resolution of macroinvertebrate data: Species-Family, Species-Genus, and Family.

B-IBI Scoring

The B-IBI scores reported below are composed of ten metrics, each with values ranging between 0 and 10. These include:

- Seven metrics for total taxa richness - Taxa Richness, Ephemeroptera [Mayfly] Richness, Plecoptera [Stonefly], Trichoptera [Caddisfly], Clinger, Lon-Lived, and Intolerant Taxa Richness;
- Percent Dominant;
- Predator Percent; and
- Tolerant Percent.

With this system, B-IBI scores range between 0 and 100, with scores between 0 and 20 considered "Very Poor," between 20 and 40 considered "Poor," between 40 and 60 considered "Fair," between 60 and 80 considered "Good," and between 80 and 100 considered "Excellent." Refer to the Puget Sound Stream Benthos website for more information on B-IBI scoring methods and data. (*See* http://pugetsoundstreambenthos.org/Biotic-Integrity-Scores.aspx).

Alteration Impacts

Because high and low flow pulses typically did not occur in pre-developed forested conditions, benthic invertebrates that are best able to withstand increases in these metrics are often more abundant in urbanized streams. These include small, mobile, short-lived species that have multiple reproductive cycles throughout the year (multivoltine species). Dominance of samples by a few mayfly (Ephemeroptera) taxa that are not clinger or predator taxa; a lack of stoneflies, caddis flies, and generally intolerant long-lived species; and a high percentage of tolerant species, such as flatworms, leeches, and black flies, typically results in lower B-IBI scores (DeGasperi et al. 2009).

Watershed Assessment

Figure 3 shows B-IBI scores for Puget Sound Water Resource Inventory Areas (WRIAs) for Water Year 2015, selected because of the abundance of data available that year.

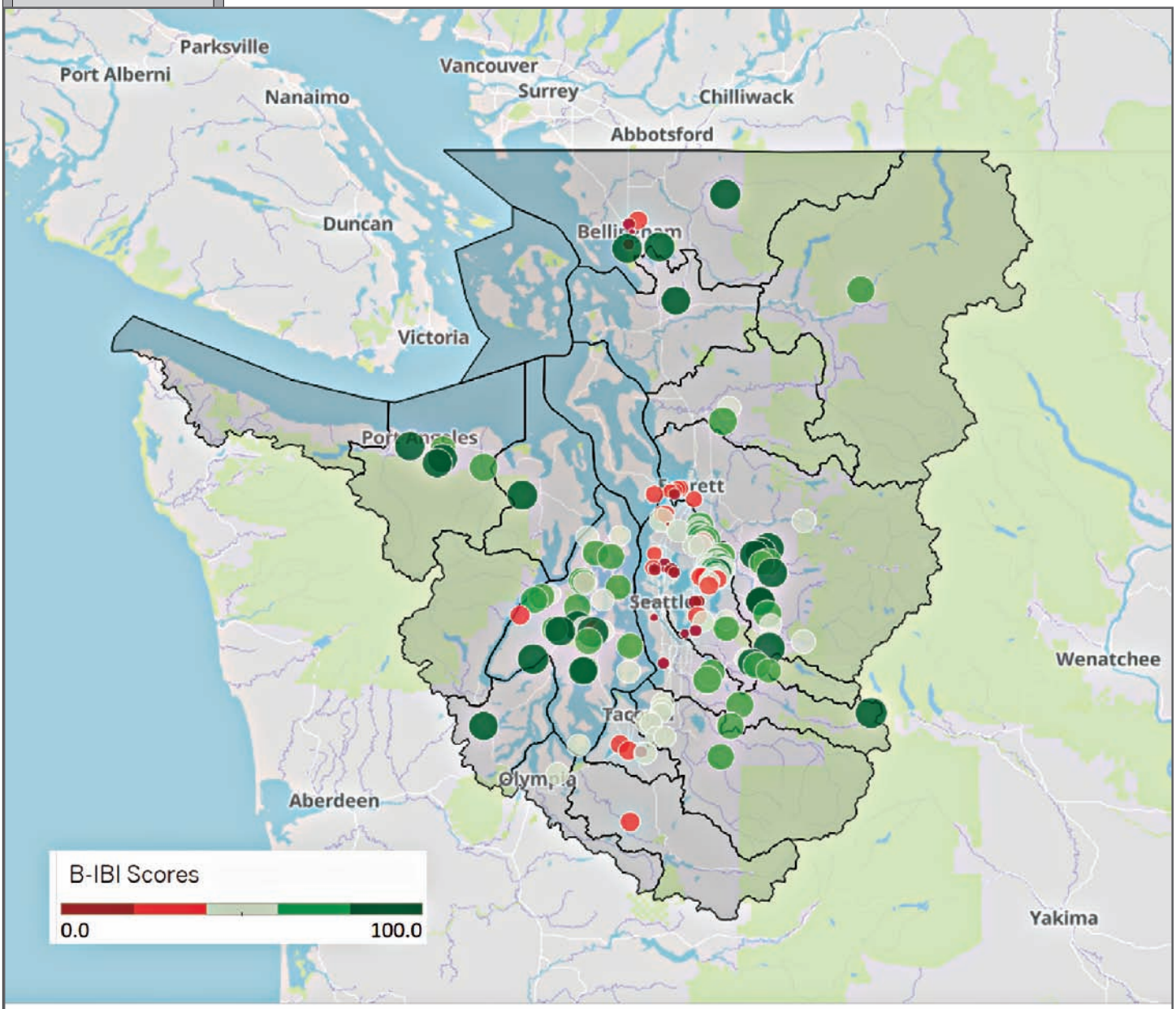


Figure 3 – B-IBI Scores for Puget Sound Watershed Resource Inventory Areas (WRIAs) for selected Water Year 2015 B-IBI data downloaded from http://pugetsoundstreambenthos.org/About-BIBI.aspx#Total and mapped in Tableau software.

Stream Scores

Figure 4 shows a breakdown of B-IBI scores for the full period of available data (1994 to 2016) for several selected Puget Lowland streams. As the figure shows, three streams — Issaquah Creek, Soosette Creek, and Covington Creek — have B-IBI scores that rate as "good," five creeks have scores that rate as "fair," and the remaining have scores that rate as "very poor." Plate B of the figure provides a comparative breakdown of the B-IBI scores by the ten component scores for each stream.

Visit this Tableau Public website link for an interactive dashboard summary of the B-IBI data: https://public.tableau.com/views/BIBIFactorsAnalysis/Dashboard1?:embed=y&:display_count=yes&publish=yes

Figure 4 – Long-term average B-IBI scores (Plate A) and component criteria scores for selected Puget Sound streams for the period 1994 to 2016. B-IBI data downloaded from http://pugetsoundstreambenthos.org/About-BIBI.aspx#Total and analyzed using Tableau software[R1]

Plate A) B-IBI scores

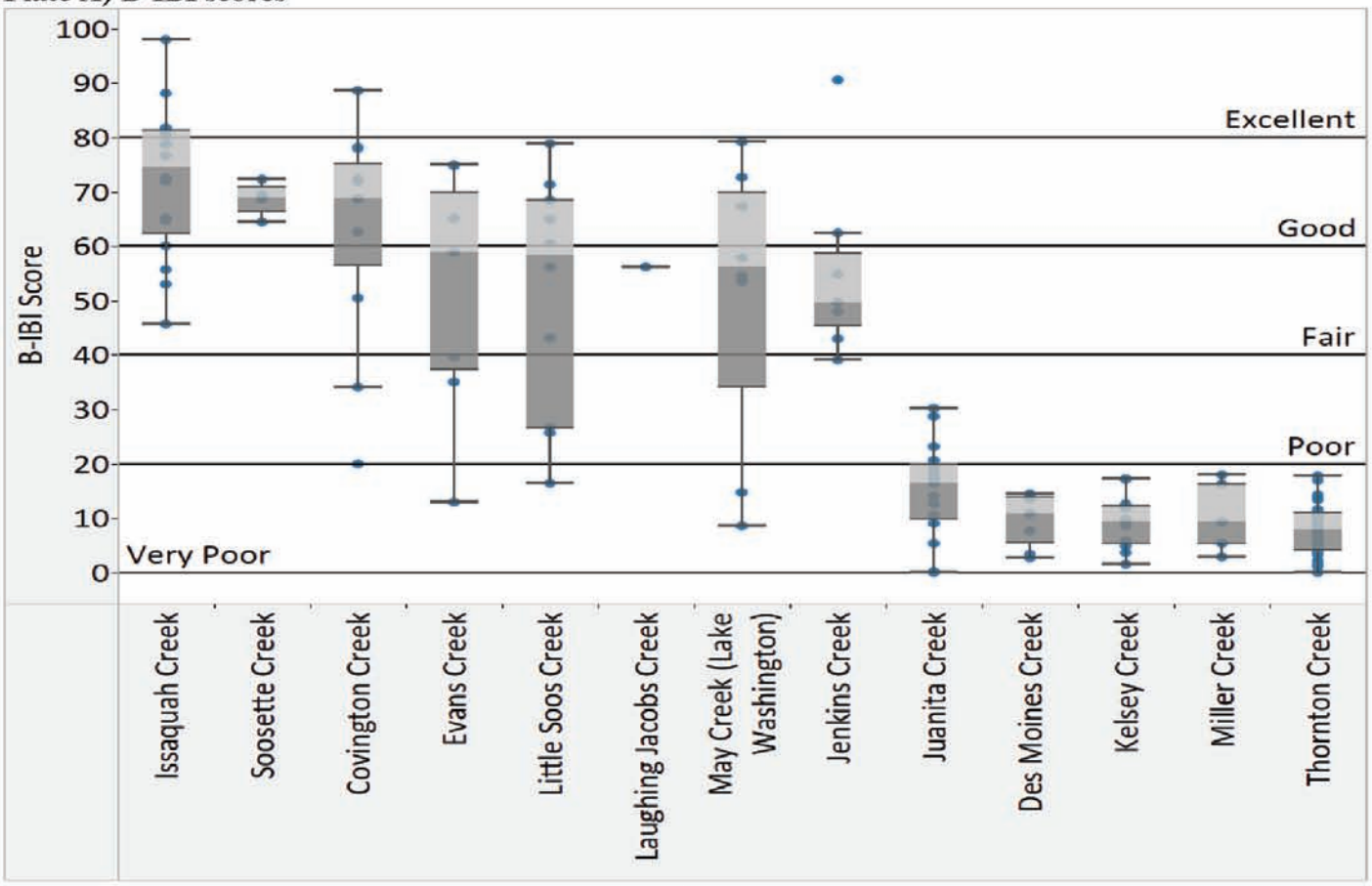
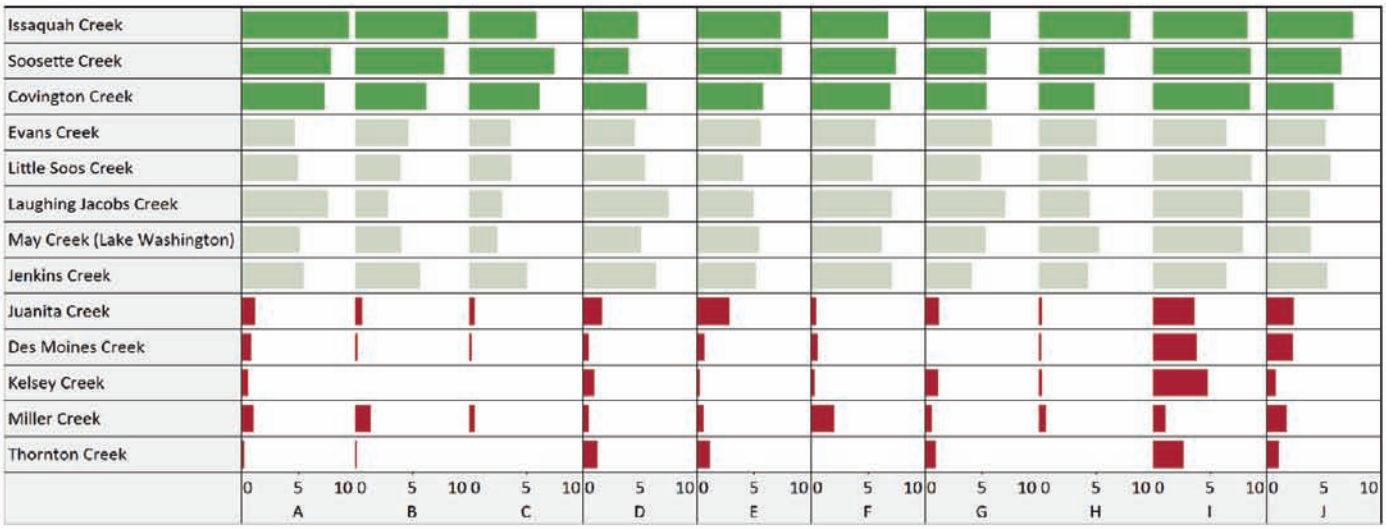


Plate B) Component Scores (A=Clinger Taxa Richness, B=Ephemeroptera Taxa Richness, C=Intolerant Taxa Richness, D=Long-Lived Taxa Richness, E=Percent Dominant, F=Plecoptera Taxa Richness, G=Percent Predator, H=Total Taxa Richness, I=Percent Tolerant, J=Trichoptera Taxa Richness). Dark green indicates "Good," light green indicates "Fair," and red indicates "Very poor" overall B-IBI scores.



Watershed Assessment

Urban Hydrology

Pulse Influence

Planning Decisions

Strategies

Robin Kirschbaum is a civil engineer with expertise in watershed planning, Low Impact Development (LID), Green Stormwater Infrastructure (GSI), hydrologic/hydraulic analysis, and stormwater facility planning, design, and construction. She brings over 18 years of engineering experience and unmatched passion for working on interdisciplinary teams to develop sustainable infrastructure and environmental solutions. She has managed or served as the lead engineer on dozens of water resource projects in the last ten years, including the King County Miller-Walker Basin Stormwater LID Retrofit Study, and the North Kitsap County LID Retrofit Study, Seattle Public Utilities Ballard Natural Drainage Systems Phase II Options Analysis and Design.

CONCLUSIONS

The hydrology of urbanizing basins in the Puget Lowlands significantly affects the biotic integrity of streams. With substantially more urban infill development planned in the coming decades to accommodate soaring population growth estimates, understanding the linkage between land use decisions, stormwater management, and ecological stream health is critical.

Many hydrologic metrics are linked to biologic alteration, but DeGasperi et al. (2009) found that two metrics — HPC and HPR — have the greatest potential for biological influence. These metrics represent the increase in frequency of high flow pulses in winter and summer and associated low flow pulses in summer that account for much of the influence on biology. Numerous other metrics evaluated were found to be surrogates for these two.

These hydrologic metrics can be used to calculate B-IBI scores when monitoring data are not available, using regression equations developed by Horner (2013). Horner provided separate regression equations for HPC ($R2 = 0.745$) and HPR ($R2 = 0.755$) with 60-, 80-, and 90-percent confidence bounds. This information can help inform planning decisions by demonstrating the uncertainty inherent in the underlying data and the equations that are based on that data. The range of possible outcomes can be assessed by applying the regression equations for best and worst-case estimates and with different confidence intervals to help inform decisions (Horner 2013).

Watershed planning provides a framework to address existing hydrologic and biologic alteration and to reduce or prevent further degradation under future build-out conditions. Planning recommendations should be based on the results of hydrologic, water quality, and biologic assessment using the best available data. A broad mix of strategies should be considered and developed, such as (Ecology 2017):

- Adjustments to designated or allowed land uses;
- Adjustments to building code requirements; and
- Implementation of capital projects.

Strategies that promote riparian and in-stream habitat that is structurally suited to a rich biota should be prioritized (Karr et al. 1986). Basin stormwater and LID retrofit strategies should also be considered and prioritized where appropriate. Retrofitting stormwater and LID facilities into the already built environment, as opposed to waiting for new or redevelopment to trigger requirements for project-specific stormwater management solutions, can help focus the watershed protection and restoration efforts and can help achieve the benefits of watershed planning at a faster rate.

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References

Booth, D.B. and C.R. Jackson, 1997. *Urbanization of Aquatic Systems: Degradation Thresholds, Stormwater Detection, and the Limits of Mitigation*. Journal of the American Water Resources Association 3:1077-1090.

Commerce 2016. *Building Cities in the Rain*. Prepared by the Washington State Department of Commerce (Commerce). Publication Number 006. September 2016.

DeGasperi, C . L., Berge, H. B., Whiting, K. R., Burkey, J. J. Cassin, J. L., and Fuerstenberg, R. R. 2009, *Linking Hydrologic Alteration to Biological Impairment in Urbanizing Streams of the Puget Lowland, Washington*, USA. JAWRA Journal of the American Water Resources Association, 45: 512-533. Doi: 10.1111/j.1752-1688.2009.00306.x.

Ecology 2015. *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution*. Publication no. 15-10-015, prepared by the Washington State Department of Ecology (Ecology), July 2015.

Ecology 2017. Reissuance of Phase I & Western Washington Phase II Municipal Stormwater Permits. Presentation made by Washington State Department of Ecology (Ecology) at Public Meeting in Lynnwood, WA, February 23, 2017.

EPA 2008. *The EPA's Handbook for Developing Watershed Plans to Restore and Protect Our Waters*. Prepared by the United States Environmental Protection Agency (EPA). March 2008.

EPA 2016. E-mail sent on October 6, 2016 from John Palmer, United States Environmental Protection Agency (EPA) Region 10, to Abbey Stockwell, Washington State Department of Ecology, regarding early input on the 2017 MS4 permit reissuance.

EPA 2017. Summary of the Clean Water Act. Prepared by the United States Environmental Protection Agency (EPA). Accessed on-line at www.epa.gov/laws-regulations/summary-clean-water-act on May 28, 2017.

Horner, R.R. 2013. *Development of a Stormwater Retrofit Plan for Water Resources Inventory Area 9: Flow and Water Quality Indicators and Targets*. King County Water and Land Resources Division, Seattle, Washington.

Karr, J. R., Fausch, K. D., Angermeier, P. L., Yant, P. R., Schlosser, I., J. *Assessing Biological Integrity in Running Waters; A Method and Its Rationale*, Illinois Natural History Survey, Special Publication 5, September 1986.

King County 2017. Daily streamflow data for Miller Creek (Gauge #42a) and Issaquah Creek (Gauge #46a) downloaded from the King County Hydrologic Information Center website http://green2.kingcounty.gov/hydrology/Data.aspx on May 29, 2017.

Konrad, C.P., D.B. Booth, and S.J. Burges, 2005. *Effects of Urban Development in the Puget Lowland, Washington, on Interannual Streamflow Patterns: Consequences for Channel Form and Streambed Disturbance*. Water Resources Research 41, W07009, doi: 1029/2005WR004097.

PSRC 2009. *Vision 2040*. Prepared by Puget Sound Regional Council (PSRC). December 2009.

Puget Sound Stream Benthos 2017. Benthic-Index of Biotic Integrity (B-IBI) data, accessed from the website http://pugetsoundstreambenthos.org/About-BIBI.aspx#Total on May 29, 2017.

The Nature Conservancy 2009, *Indicators of Hydrologic Alteration (IHA): Software for Understanding Hydrologic Changes in Ecologically-Relevant Terms*, Version 7.1, accessed from www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/IndicatorsofHydrologicAlteration/Pages/IHA-Software-Download.aspx on May 29, 2017.

Clean Water Rule

CLEAN WATER ACT RULE

REVIEW OF THE CLEAN WATER ACT JURISDICTIONAL RULE
CONSIDERATIONS FOR MOVING FORWARD

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INTRODUCTION

"Waters"

More than 40 years after its passage, the two agencies charged with administering the federal Clean Water Act (CWA) still struggle to address perhaps the most fundamental aspect of its implementation — identifying the "waters" it protects. The US Environmental Protection Agency (EPA) and the US Army Corps of Engineers (Corps) published a rule in June 2015 intending to do just that. 80 Fed. Reg. 37054 (June 29, 2015). The ensuing melee among stakeholders reflects the legal confusion and political divisiveness that continues to grow around this issue.

Executive Order

The latest twist in this ongoing saga is the Trump Administration's issuance of Executive Order 13778 (EO 13778 or "Order"), which, among other things, requires EPA and the Corps ("Agencies") to rescind or revise the "Clean Water Rule" in accordance with certain policy considerations. 82 Fed. Reg. 12497 (March 3, 2017), (*see* Taylor, *TWR* #157). The upcoming rulemaking process provides a unique opportunity for the regulated community to shape the future of CWA jurisdiction.

Clean Water Rule

Much has been written about the Clean Water Rule (Rule) since the Agencies first proposed it in April 2014 — mostly about its many shortcomings. While regulated interests have voiced numerous legitimate concerns, the Rule has potentially favorable aspects that have received scant attention. To maximize its opportunity, the regulated community should understand the Rule in context, and take honest stock of what it needs from a new rule.

Exclusions

This article addresses the Rule with an eye toward regulated interests in Colorado, where the Rule, with refinement, could actually improve the current system. More specifically, it focuses on the Rule's jurisdictional exclusions, which are key to alleviating concerns of federal overreach, and directing CWA authority to higher value aquatic resources. Despite this focus, many of the considerations raised herein are relevant to regulated entities in other parts of the country, particularly the arid West.

This article first provides context for the Rule by explaining where it fits into the CWA and how the Rule relates to the existing jurisdictional regime. It then addresses specific provisions that Colorado entities should consider as the regulatory process unfolds.

BACKGROUND

Congress passed the modern-day CWA in 1972 "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. §1251(a). Given the appalling state of the nation's waters at the time, the Act found strong support and cruised through both houses of Congress. The Act stated ambitious goals, including the complete elimination of the discharge of pollutants by 1985. *Id*.

Discharge Prohibition

The Act's primary functional element is the "Discharge Prohibition," which prohibits the discharge of a pollutant by any person except in compliance with a permit. *Id*. at §1301(a). The Act defines "discharge of a pollutant" in relevant part as "any addition of any pollutant to *navigable waters* from any point source." *Id*. at §1362(12) (emphasis added). The meaning of the phrase "navigable waters," therefore, defines the CWA's jurisdictional reach and, thus, where the CWA applies.

"Navigable Waters"

Congress defined the phrase "navigable waters" in relevant part as "waters of the United States." *Id*. at §1362(7). This definition, of course, is vague and not very helpful, which is why the extent of CWA jurisdiction remains a topic of heated debate.

The Agencies' recent rulemaking effort was prompted primarily by confusion caused by two United States Supreme Court opinions and subsequent Agency guidance on how to assess jurisdiction in the wake of those opinions. The resulting uncertainty has created what is often a cumbersome process involving case-by-case jurisdictional determinations of coverage that are time-consuming and inconsistent across the country. This situation prompted requests by diverse interests for a new regulation. 80 Fed. Reg. at 37056; 82 *Fed. Reg.* 12532 (March 6, 2017).

"Significant Nexus"

The Rule would change the foundational approach to defining "Waters of the United States" from one rooted in Commerce Clause considerations (see Existing Regulation, below), to one based on a "significant nexus" analysis (see The *Rapanos* Decision, below). The Rule would define jurisdiction for all sections of the Act, including the Section 402 and 404 permitting programs (33 U.S.C. §1342 and §1344 respectively), Section 401 state water quality certification (33 U.S.C. §1341), and the Section 303 water quality standards and total maximum daily load programs (33 U.S.C. §1313). Under this approach, the CWA would cover

Clean Water Rule

Jurisdiction

the following waters:

- Traditional navigable waters, interstate waters, and the territorial seas ("Principal Waters"); and
- Waters having a significant nexus to Principal Waters (i.e., those that either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of Principal Waters).

The Rule further divides the significant nexus category into:

- Waters assumed by rule to have such a significant nexus (tributaries, adjacent waters, and impoundments); and
- Waters determined to have such a significant nexus on a case-specific basis.

80 Fed. Reg. at 37104-5 (33 CFR §328.3(a)).

Bright-Line Approach

The Rule employs a bright-line approach intended to clarify and simplify its implementation by reducing the need for case-by-case jurisdictional determinations. *Id*. at 37055. This would certainly change the Act's coverage, but the extent to which it would do so is difficult to gauge without actual application in the field. The Rule's basis for asserting jurisdiction does not translate to a clear expansion or contraction of existing practices. This created uncertainty for the regulated community.

Not surprisingly, the Rule drew sharp criticism. Shortly after its publication, both houses of Congress advanced proposals to prohibit its implementation. *See e.g*., S. 1140 sponsored by Wyoming Senator John Barrasso; H.R. 1732, sponsored by Pennsylvania Representative Bill Schuster. States, along with groups representing both regulated and environmental interests jumped into the fray, filing numerous lawsuits. Where to properly file such challenges — in a federal district or appeals court — was unclear, so those challenging the Rule filed in both. This led to a complex tangle of legal proceedings across the country.

Rule Stayed

Colorado was one of many states to challenge the Rule. It joined 12 other states in a suit filed in the US District Court for the District of North Dakota. Petitioners in that action convinced the court to stay implementation of the Rule on August 27, 2015, the day before it was to take effect. *North Dakota v. U.S. Environmental Protection Agency*, 127 F. Supp. 1047 (D.N.D. August 27, 2015). The court later clarified that its stay only applied in the 13 states represented in the suit. *North Dakota v. U.S. Environmental Protection Agency*, 3:15-cv-59 (D.N.D. September 4, 2015). The other district courts entertaining challenges to the Rule did not issue stays.

Sixth Circuit Consolidation

Meanwhile, the United States Judicial Panel on Multidistrict Litigation moved all challenges filed in circuit courts into the Sixth Circuit Court of Appeals in Cincinnati. *In Re: EPA and Dep't of Defense Final Rule* 80 Fed. Reg. 37054, Published on June 29, 2015, MCP No. 135 (July 28, 2015). In an effort to "temporarily silence[] the whirlwind of confusion" generated by the Rule and its uncertain legal status, the Sixth Circuit stayed implementation of the Rule nationwide, effective October 9, 2015. *In re: EPA and Dep't of Defense Final Rule*, 803 F.3d 804, 808 (6th Cir. 2015).

In issuing the stay, the Court determined that the petitioners challenging the Rule had demonstrated a substantial possibility of success on the merits of their claims. *Id*. at 807. In particular, the Sixth Circuit questioned whether the Rule was consistent with US Supreme Court precedent, and whether its promulgation complied with Administrative Procedure Act requirements. *Id*.

Oddly, the Sixth Circuit only determined that it was the proper forum to hear the case on February 22, 2016 — four months after granting the stay. *In Re EPA and Dep't of Defense Final Rule,* 817 F.3d 261 (6th Cir. 2016). The National Association of Manufacturers petitioned the US Supreme Court (Supreme Court) for review of the Sixth Circuit's proper forum ruling, which the Supreme Court granted on January 13, 2017. *National Association of Manufacturers v. Dep't of Defense*, 137 S.Ct. 811 (January 13, 2017). The Sixth Circuit has not ruled on the merits of the case.

Executive Order 13778

Six weeks later, President Trump issued EO 13778, which declares it to be in "the national interest to ensure that the Nation's navigable waters are kept free from pollution, while at the same time promoting economic growth, minimizing regulatory uncertainty, and showing due regard for the roles of the Congress and the States under the Constitution." To further this policy statement, the Order also:

Rule Review

- Directs the Agencies to review the Rule for consistency with the foregoing policy, and to publish for notice and comment a proposal to rescind or revise the Rule as appropriate and consistent with law;
- Directs the Agencies and all other executive departments and agencies to review all orders, rules, regulations, guidelines, or policies implementing or enforcing the Rule for consistency with the policy and to rescind or revise those actions as appropriate and consistent with law;
- Authorizes the Attorney General to take those measures he deems appropriate regarding any litigation related to the Rule pending completion of the Agencies' review; and

Scalia Opinion

- Requires the Agencies in any future rulemaking to "consider interpreting the term 'navigable waters'… consistent with" Justice Antonin Scalia's opinion in *Rapanos v. United States*, 547 U.S. 715 (2006) (see The *Rapanos* Decision, below).

Clean Water Rule

Rule Revision?

The Agencies reacted quickly, publishing a notice one week later of their intent to review and rescind or revise the Rule. 82 Fed. Reg. 12532 (March 6, 2017). In that same notice, the Agencies further stated their intent to propose a rule consistent with the Order. *Id*.

The Supreme Court's acceptance of certiorari to address the proper forum issue has temporarily halted the Sixth Circuit's consideration of the merits of the challenge to the Rule. The Supreme Court, however, denied the Administration's request to pause its proceedings pending efforts to rescind or revise the Rule. *National Association of Manufacturers v. Dep' of Defense*, 2017 WL 1199467 (April 3, 2017). This sets up a potential race between the Administration's efforts to issue a revised rule, and judicial efforts to evaluate the merits of the Rule.

Scalia Opinion

While it is virtually certain the Rule will not survive in its current form, its exact fate is less clear. The Agencies have yet to explicitly identify the substantive approach they will take with the replacement rule. EO 13778 directs the Agencies to "consider" Justice Scalia's opinion in *Rapanos*, as opposed to "follow" or "implement" it. This may just be an effort to protect any resulting rule from challenge as arbitrary and capricious by not directing any particular outcome. However, it remains open to debate whether Scalia's *Rapanos* opinion is itself consistent with the CWA.

Rulemaking Records

Moreover, the Agencies compiled a substantial administrative record to support the Rule. They cannot simply reverse course and issue a different rule without another formal rulemaking and reasoned support for the change. Developing a new record sufficient to support Scalia's approach could present a formidable task.

Any new or revised rule will almost certainly be challenged, which means that the ultimate resolution of CWA jurisdiction may still be years off. In the meantime, absent the issuance of new guidance, the Agencies will continue to assess jurisdiction under the regulatory regime and associated guidance existing prior to the intended effective date of the Rule (August 28, 2015).

EXISTING REGULATION

EXPANSIVE JURISDICTIONAL CONVERAGE

EPA has defined its CWA jurisdiction broadly since shortly after the Act's passage. *See* 38 Fed. Reg. 13528, 13529 (May 22, 1973). The Corps required prompting to follow suit. *See Natural Resources Defense Council, Inc. v. Callaway*, 392 F.Supp. 685 (D.D.C. 1975), which struck down the Corps' initial regulation defining CWA jurisdiction as too narrow. However, both Agencies have taken similar approaches to jurisdiction since 1975, at least in terms of official regulation and policy, if not actual implementation in the field. *See* 40 Fed. Reg. 31320, 31324 (July 27, 1975).

Common wisdom among the regulated community is that the Rule significantly expands the Act's reach. This somewhat ignores the potentially sweeping coverage of the rule it would replace ("Existing Rule"), and how the Agencies have asserted jurisdiction in recent years.

Existing Rule (Scope)

The Existing Rule encompasses the following as "Waters of the United States:"

a. All waters currently used, previously used, or susceptible to use in interstate or foreign commerce, including those subject to tidal effects ("Traditional Navigable Waters");
b. All Interstate Waters;
c. All "Other Waters" such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, including any such waters that:
    i. Are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii, From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Are or could be used for industrial purposes by industries in interstate commerce;
d. All "Impoundments" of otherwise jurisdictional waters;
e. All "Tributaries" of waters identified in a. through d.;
f. The Territorial Seas;
g. Wetlands "adjacent" to the forgoing waters.

See 33 CFR §328.3(a); 40 CFR §122.2.

Clean Water Rule

The Rule is similarly structured, but extends the "adjacency" category from "wetlands" to all "waters," and replaces the "Other Waters" category in the Existing Rule with a case-specific "significant nexus" category. *See* 80 Fed. Reg. 37054, 37104 (June 29, 2015) (33 CFR §328.3(a)). It also defines certain key terms not currently defined in the Existing Rule.

Clean Water Rule

Interstate Commerce

The Agencies intended the "Other Waters" category of the Existing Rule to extend the Act's reach to the maximum extent permissible under the Commerce Clause of the United States Constitution. *See e.g., Natural Resources Defense Council, Inc. v. Callaway*, 392 F.Supp. 685, 686 (D.D.C. 1975); 42 Fed. Reg. 37122, 37144 n. 2 (July 19, 1977). Since courts have found impacts to interstate commerce in seemingly trivial localized activities, the potential reach of the Existing Rule is extensive. *See Wickard v. Filburn*, 317 US 111 (1942) (growing wheat for personal consumption impacts interstate commerce). But compare *United States v. Morrison*, 529 U.S. 598 (2000) that held that the Commerce Clause does not provide Congress authority to enact a federal civil remedy; and *United States v. Lopez*, 514 U.S. 549 (1995) where the court held that a statute prohibiting possession of firearms in a school zone exceeds Congress' Commerce Clause power. While the Supreme Court has issued two opinions checking broad assertions of CWA jurisdiction, notably neither case invalidated any portion of the Existing Rule.

Migratory Bird Rule

In *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (SWANCC), a 5-4 majority refused to extend federal jurisdiction to wholly intrastate ponds created by sand and gravel mining (some of which were seasonal) solely because the ponds provided habitat for migratory birds. The basis for asserting jurisdiction in this case was the so-called "Migratory Bird Rule."

The Migratory Bird Rule was not a rule promulgated in accordance with Administrative Procedure Act requirements. It arose in clarifications the Agencies provided in Federal Register preambles to explain how broadly they interpreted the "Other Waters" category in the Existing Rule.
Specifically, they would have extended "Other Waters" to:

- Waters that are or would be used as habitat by birds protected by Migratory Bird Treaties
- Waters that are or would be used as habitat by other migratory birds which cross state lines

51 Fed. Reg. 41206, 41217 (November 13, 1986); 53 Fed. Reg. 20764, 20765 (June 6, 1988).

SWANCC Limit

The Migratory Bird Treaty Act (16 U.S.C. §§703-12) covers over 1000 bird species in the US, including common species such as robins, mourning doves, and crows. It even applies to some birds that do not actually migrate. 80 Fed. Reg. 30032, 30033 (May 26, 2015). Given this breadth, the Corps' attempt to assert jurisdiction over the ponds based solely on migratory bird use was quite a reach, and the Court was not willing to allow it without a clear expression of congressional intent. *SWANCC* at 172-3. One might ask, however, whether the Supreme Court would have rejected jurisdiction if the ponds had stronger commerce connections. For instance, if they also hosted water skiing and fishing tournaments that attracted participants from around the country.

The _Rapanos_ Decision

In *Rapanos*, the Supreme Court held that the Corps improperly asserted jurisdiction over wetlands adjacent to non-navigable ditches and drains that eventually flowed to Traditional Navigable Waters (TNWs). However, a majority of the Court's Justices could not agree on a rationale for the holding and the case resulted in a plurality opinion.

Plurality Opinion

Four Justices concluded that the Agencies' assertion of jurisdiction was a reasonable interpretation of the Act. *Rapanos* at 787-812. Four Justices, in an opinion written by Justice Scalia (the "Plurality"), stated that CWA jurisdiction extends only to "relatively permanent, standing or continuously flowing bodies of water" connected to TNWs, and to wetlands having a "continuous surface connection" to such waters. *Id*. at 739 and 742. (*Rapanos* is the opinion referenced in EO 13778).

Scalia Opinion

"Significant Nexus"

Justice Kennedy broke the tie, siding with the four justices that found that the Corps lacked jurisdiction over the waters at issue. However, his underlying rationale differed from the other justices. He reasoned that the Corps lacked jurisdiction because it never established that the wetlands at issue, either alone or in combination with other similarly situated wetlands in the region, significantly affected the chemical, physical, and biological integrity of a TNW. *Rapanos* at 780. This came to be known as the "significant nexus" approach and Kennedy's concurring opinion provides the foundation for the Rule.

Agencies' Guidance

Characterizing *SWANCC* and *Rapanos* as broadly repudiating expansive CWA jurisdiction is a bit misleading. As previously mentioned, neither case invalidated any portion of the Existing Rule. Moreover, after *Rapanos* the Agencies issued guidance that essentially allows jurisdiction to be established under either Justice Kennedy's significant nexus approach or Justice Scalia's approach. *See Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States* (December 2, 2008) ("Post-*Rapanos* Guidance"); available at: www.epa.gov/cwa-404/2008-rapanos-guidance-and-related-documents. Through this guidance the Agencies have continued to assert jurisdiction over most of the same waters they had been regulating prior to Rapanos.

Rule Impact

To provide some context in this regard, the Agencies have estimated that, compared to the Existing Rule and historic practices (pre-*Rapanos*) of assessing jurisdiction, the Rule will decrease the scope of jurisdictional waters. Compared to more recent practices (post-*Rapanos*), the Agencies have estimated that the Rule would increase positive jurisdictional determinations 2.84% to 4.65% annually. 80 Fed. Reg. at 37101. It should be noted, however, that many have disputed these figures.

Clean Water Rule

State Authority

Colorado Definition

COLORADO DEFINES STATE WATERS BROADLY

With EPA approval, a state can run its own Section 402 (effluent discharge) and Section 404 (dredge and fill) permitting programs. Colorado lacks Section 404 permitting authority, but EPA has granted Colorado Section 402 authority, which the State administers through its Colorado Discharge Permit System (CDPS) program. Under this program, one must obtain a CDPS permit before discharging pollutants to "State Waters." 5 Colo. Code Regs. § 1002-61.3(1)(a) (2017).

Colorado defines "State Waters" more broadly than the Agencies define "Waters of the United States" under either the Rule or the Existing Rule. "State Waters" include "any and all surface and subsurface waters which are contained in or flow in or through this state… ." Colo. Rev. Stat. § 25-8-103(19) (2016). Thus, for instance, "State Waters" covers groundwater, which the Rule specifically excludes.

In addition to CWA Section 402 permitting, the definition of "State Waters" delineates CWA jurisdiction in Colorado for purposes of water quality certification, water quality standards, and development of **t**otal **m**aximum **d**aily **l**oads (TMDLs). Thus, the Rule would have little practical effect in Colorado outside of the CWA Section 404 permitting context. For example, some have expressed concern that the Rule would increase federal regulation of pesticide application. However, Colorado regulates pesticide discharges through its CDPS program (CWA Section 402), in which the definition of "State Waters" controls.

Variable Impact

THE RULE WOULD IMPACT DIFFERENT AREAS OF THE COUNTRY DIFFERENTLY

The Rule would expand jurisdiction in some circumstances and narrow it in others. This dynamic would differ across the country.

"Isolated" Waters

One aspect of the Rule that could significantly expand jurisdiction is its treatment of five categories of "isolated" waters (Prairie Potholes, Carolina and Delmarva Bays, Pocosins, Western Vernal Pools in California, and Texas Coastal Prairie Wetlands). The Rule assumes that waters in these five categories are "similarly situated" for purposes of a case-specific significant nexus evaluation. 80 Fed. Reg. at 37104-5 (33 CFR §328.3(a)(7)).

This assumption increases the chance that such waters will be jurisdictional, and has the potential to significantly increase the number of jurisdictional waters in certain areas of the country. This aspect of the Rule, however, would not affect Colorado since these waters do not occur in the State.

Bright Lines & Exclusions

THE RULE PROVIDES A WORKABLE STRUCTURE FOR DEFINING JURISDICTION

The Rule uses bright jurisdictional lines where possible to clarify jurisdiction and decrease the need for case-specific analyses. This increases certainty for regulated entities, but can also create a rigid regulatory scheme. To help counter this, the Rule excludes specific waters and features from coverage. Many of these exclusions codify prior Agency treatment of certain waters and features that were identified in past Federal Register preambles ("Preamble Exclusions"). 51 Fed. Reg. 41206, 41217 (November 13, 1986); 53 Fed. Reg. 20764, 20765 (June 6, 1988).

"Recapture" Jurisdiction

Two related aspects of the Rule's exclusions are particularly noteworthy. First, under the Preamble Exclusions, the Agencies reserve the right to declare on a case-specific basis that a given water is jurisdictional even though it falls within an excluded category. *Id*. The Rule does not allow such case-specific analyses. 80 Fed. Reg. at 37098. Second, under the Rule, a water or feature meeting the terms of an exclusion cannot be "recaptured" under any jurisdictional category (i.e., once out, always out). 80 Fed. Reg. at 37073 and 37096.

Thus, under the Rule, exclusions are key to appropriately focusing the Act's protections. To function properly, however, the exclusions must be clearly articulated and appropriate in scope. As discussed below, several exclusions important to Colorado need further attention in this regard.

CONSIDERATIONS and IMPLICATIONS MOVING FORWARD

Replacement Rule

The Agencies recently indicated that they will pursue a two-step process to implement EO 13778: first rescind the Rule while maintaining the current approach to assessing jurisdiction; and then propose a replacement rule that "takes into consideration the principles" of the Scalia test. *See* www.epa.gov/wotus-rule/rulemaking-process#2Step. A strict Scalia approach would likely render further discussion of refinements to the Rule irrelevant, at least in the short term.

Such an approach, however, would represent a significant change to the jurisdictional status quo, and regulated interests should consider the implications. A thorough identification and discussion of the issues this raises is beyond the scope of this article, but even a cursory evaluation suggests challenges ahead.

CWA's Broad Reach

As an initial matter, one can expect considerable debate around whether the Scalia test is a defensible interpretation of the Act. For example, courts have cited the CWA's legislative history to support a broad constitutional reach, recognizing the need to control pollution at its source in order to achieve the Act's goals. *See e.g., United States v. Riverside Bayview Homes, Inc*., 474 U.S. 121, 133 (1985). A strict Scalia test may be too limited in this regard. Additionally, Justice Stevens, in his dissenting opinion in *Rapanos*,

Clean Water Rule

***Rapanos* Meaning?**

CWA Requirements

CWA Support

asserted that CWA jurisdiction exists if either the Scalia or Kennedy test is met. *Rapanos* at 810. Many lower courts struggling to divine the meaning of the 4-4-1 *Rapanos* decision have accepted this approach as governing law. *See e.g., United States v. Donovan*, 661 F.3d 174, 184 (3rd Cir. 2011).

Second, the Agencies developed a substantial administrative record to support the Rule. Developing a new record to support a significantly different approach could be a formidable challenge. How the Agencies will address this challenge remains unclear, but it may compel consideration of a rule that blends concepts from the Rule, the Existing Rule, and the Scalia approach.

Third, reducing federal jurisdiction will not eliminate the Act's requirements, such as attaining and maintaining water quality standards. It will merely *shift* the burden of meeting these requirements. If the Agencies correctly concluded that impacts to outlying waters covered by the Rule significantly affect the chemical, physical, and biological integrity of downstream TNWs, then eliminating protection of such waters would shift the cost of compliance from those causing the impacts to downstream users. Furthermore, it would almost certainly increase the burden on state budgets, and reduce national uniformity in regulating water quality.

Finally, the CWA is an iconic environmental statute enacted after decades of gradually increasing federal efforts to address the nation's deteriorating water quality. It enjoyed overwhelming congressional support when passed. *See* William L. Andreen, *The Evolution of Water Pollution Control in the United States — State, Local, and Federal Efforts, 1789-1972: Part II*, 22 Stan. Envtl. L.J. 215, 285-6 (2003). While there seems to be little risk of slipping back to the days of burning rivers, the Act is still popular, and efforts perceived as weakening it will likely generate strong opposition. Such efforts would also risk reversal under a future administration.

Of course, as previously mentioned, the Sixth Circuit made it clear that the Rule has its own vulnerabilities. While detailed discussion of these issues is also beyond the scope of this article, to the extent that the Rule's rulemaking did not meet Administrative Procedure Act requirements, a new rulemaking would render such procedural shortcomings moot. As to portions of the Rule that may be inconsistent with Supreme Court precedent, the Trump Administration would almost certainly support paring back such potential regulatory overreach. (For example, eliminating the assumption that certain waters are similarly situated for purposes of a case-specific significant nexus analysis.)

JURISDICTIONAL EXCLUSIONS: COLORADO and OTHER STATES

Given the uncertainty surrounding the upcoming rulemaking, it is important for Colorado entities to understand the potentially favorable provisions of the Rule regardless of how the proposed replacement is structured. Many aspects of the Rule have similar implications nationwide. For instance, the exclusions for puddles or stormwater control features do not appear to raise significantly different issues in Colorado than they do along the East Coast. Other aspects of the Rule deserve specific consideration by Colorado entities.

Ditch Exclusion

Ditch as Tributary

Ditch Exclusion

Colorado's early settlers constructed an intricate network of irrigation ditches and reservoirs to make water available at the times and places needed to grow crops, raise livestock, and supply towns and industry. These ditches remain fixtures on the land and routinely raise CWA permitting issues (particularly in the Section 404 context).

The Agencies have long considered ditches in general to be jurisdictional as tributaries. *See e.g., In re Town of Buckeye, Arizona*, 1977 WL 28254 at 1 (November 11, 1977), which found the Arlington Canal, an earthen irrigation ditch — whose flow consisted primarily of groundwater pumped from wells, irrigation return flows, and treated sewage effluent — to be jurisdictional. In *Treacy v. Newdunn Associates, LLP*, 344 F.3d 407, 417 (4th Cir. 2003), the court held that the fact that the ditch at issue "is man-made rather than a natural watercourse is…irrelevant" to its status as a jurisdictional tributary. Meanwhile, in 40 Fed. Reg. 31320, 31321 (July 25, 1975), a Corps' rule defines "navigable waters" to include certain man-made canals, but specifically excludes drainage and irrigation ditches. In fact, under the Existing Rule as implemented with post-*Rapanos* guidance, the Corps takes jurisdiction over many, if not most, irrigation ditches in Colorado.

Irrigation Ditch in Northern Colorado
Irrigation ditches are designed and managed to maximize conveyance efficiency.

The Rule, as proposed ("Proposed Rule"), added certain ditch exclusions. 79 Fed. Reg. 22188, 22268 (April 21, 2014). However, the Agencies crafted these exclusions in a way that seemed to preclude their application to most irrigation ditches.

Clean Water Rule

Ditch Types Excluded

The Agencies received many comments on the proposed ditch exclusions and tried to clarify them in the final Rule. Contrary to the Agencies' claims, the ditch exclusions remain confusing. *See* 80 Fed. Reg. 37097: "These ditch exclusions are clearer for the regulated public to identify and more straightforward for agency staff to implement than the proposed rule or current policies.")

The Rule excludes the following ditches from jurisdiction:

- Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary;
- Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands; and
- Ditches that do not flow, either directly or through another water, into a Principal Water.

80 Fed. Reg. at 37105 (33 CFR §328.3(b)(3)).

As an initial matter, a ditch meeting the third criterion does not even constitute a "tributary" as defined, so the operable exclusions are the first two. The two operable exclusions state ambiguous concepts in a way that suggests their meaning is obvious. To the extent the Agencies explain these concepts, they do a poor job.

"Relocated Tributary"

The Agencies provide a confusing and seemingly contradictory explanation of what constitutes a ditch that is a "relocated tributary." They state that a "*stream*…that has been *channelized or straightened* because its natural sinuosity has been altered, cutting off the meanders, *is not a ditch*." They then state that a "*ditch* that relocates a stream is *not an excluded ditch*..., and a stream is relocated either when *at least a portion of its original channel has been physically moved*, or when the majority of its flow has been redirected." *Id*. at 37078 (emphasis added).

Channelizing

Channelizing or straightening a stream to cut off its meanders would require moving at least a portion of the original channel. The examples seem contradictory in terms of whether the manipulated portion of such a water constitutes a "ditch" or a "stream."

"Excavated"

In one respect this may just be semantics — the water is jurisdictional in both instances. However, the distinction could be relevant in certain circumstances. For instance, the Section 404(f)(1)(C) permitting exemption applies to, among other things, "ditches" but not "streams." *See* 33 U.S.C. §1344(f)(1)(C). Moreover, the explanation does little to clarify this aspect of the exclusion. Additionally, the Agencies never really even attempt to explain what constitutes a ditch "excavated in a tributary." Thus, these exclusions need further clarification.

Ditch v. Stream

The ditch exclusions and corresponding preamble discussions in the Rule and Proposed Rule suggest the Agencies may lack a sound understanding of irrigation ditches and attendant Western water management. Along these lines, in conjunction with the release of the Rule, then EPA Administrator Gina McCarthy explained that ditches that "still look and act like a stream, [are] a stream." *More Waterways Likely Protected under New EPA Rule*, Elizabeth Shogren, DC Dispatch, May 28, 2015 at www.hcn.org/articles/epa-federally-protected-streams-wetlands-water-obama-mccarthy.

Ditch Maintenance

Irrigation ditches are designed and maintained to maximize conveyance efficiency. Features that hinder conveyance efficiency tend to increase seepage losses and complicate deliveries to the lower end of the ditch. Thus, irrigation ditches normally lack features that create habitat in natural streams, such as meanders, large rocks, and woody debris. In fact, typical annual ditch maintenance includes burning and clearing to remove vegetation and other obstructions that accumulate over the previous year.

Aquatic Function

Irrigation ditches, therefore, typically provide minimal aquatic function. What little function they might provide is artificially sustained and subject to complete elimination by mere change in ownership of the underlying water rights.

Broad Exclusion?

The Agencies note that the Rule's language reflects careful consideration of public input received on the proposal, including input seeking clarification and expansion of the ditch exclusions. *Id*. at 37097. Given their comments, and considering the nature of irrigation ditches, one could conclude that the Agencies intended a fairly broad application of the ditch exclusions that would cover most irrigation ditches in whole or in part. What they actually provided, however, seems unnecessarily complicated.

Drainage Ditches

The CWA recognizes two types of ditches — irrigation ditches and drainage ditches — and treats them differently. CWA Section 404(f)(1)(C) creates differing levels of permitting exemptions for the two types of ditches. Specifically, this provision exempts from permitting the *construction or maintenance of irrigation* ditches, but only the *maintenance of drainage* ditches. 33 U.S.C. §1344(f)(1)(C).

Similarly, the Agencies by regulation recognize two types of ditches, and the Corps has issued detailed guidance distinguishing them. 40 CFR §232.3(c)(3); 33 CFR §323.4(a)(3); Regulatory Guidance Letter 07-02, *Exemptions for Construction or Maintenance of Irrigation Ditches and Maintenance of Drainage Ditches Under Section 404 of the Clean Water Act*, Corps (July 4, 2007) ("RGL 07-02"). In contrast, the Agencies lump the two types of ditches together for purposes of the ditch exclusions in the Rule.

Irrigation Ditch Exclusion

Moving forward, the better approach for ditches may be to distinguish the two types of ditches by rule, and to specifically exclude irrigation ditches. A specific exclusion would be consistent with statutory structure and past Agency practice in certain permitting contexts. It would also enable more efficient use of CWA resources by allowing the Agencies and regulated community to focus protection on more ecologically significant waters.

Clean Water Rule

Wetlands Source

"Shut Off" Requirement

Artificially Irrigated Areas Exclusion

The Rule excludes "artificially irrigated areas that would revert to dry land should application of water to that area cease." 80 Fed. Reg. at 37105 (33 CFR §328.3(b)(4)(i)). This provision grew from a similar Preamble Exclusion for "artificially irrigated areas which would revert to upland if the irrigation ceased." 51 Fed. Reg. at 41217 and 53 Fed. Reg. at 20765.

In RGL 07-02, the Corps, referencing the Preamble Exclusion, explained that wetlands "established solely due to the *presence of irrigation water, irrigated fields, or irrigation ditches*" are not jurisdictional. *Id*. at 3 (emphasis added). An accompanying footnote further clarified that "waters, including wetlands, created as a result of irrigation would not be considered waters of the United States even when augmented on occasion by precipitation." *Id*. at note 1. The wording of the Rule arguably supports a more limited exclusion than that reflected by RGL 07-02 and prior preambles.

However, under current practices, the Agencies can deem wetlands that would otherwise qualify for the corresponding Preamble Exclusion, to be jurisdictional on a case-specific basis. The Rule categorically excludes them.

To demonstrate that wetlands qualify for this Preamble Exclusion, Corps offices in Colorado typically require one to "shut off" the water to the area in question for a period of years until the area dries out. Irrigation needs, project schedules, and ownership and control over irrigation systems and practices render this unrealistic, and effectively eliminate the exclusion. If science and policy support this exclusion, it should be available as a practical matter.

Artificially Irrigated Area
Large wetland area on left created by seepage from ditch on right.

Irrigation practices and infrastructure have created numerous wetlands in Colorado. Some of these areas are fairly extensive. One recent study indicates that water from irrigation practices and infrastructure sustains about 90% of the wetlands existing within the service area of a large Front Range irrigation company. Sueltenfuss JP, Cooper DJ, Knight RL, Waskom RM, *The Creation and Maintenance of Wetland Ecosystems from Irrigation Canal and Reservoir Seepage in a Semi-Arid Landscape***,** Wetlands (2013*),* 33: 799. doi:10.1007/s13157-013-0437-6. Anecdotal observation suggests this situation is likely common across the State, and demonstrates the potential scope of this exclusion in Colorado.

"Adjacent Waters"

Gravel Pits

Active Mining Permit

Water-Filled Depressions Created by Mining or Construction Activity Exclusion

The Rule expands the existing jurisdictional category of "Adjacent Wetlands" to cover "Adjacent Waters," and makes all such waters jurisdictional by rule. 80 Fed. Reg. at 37104 (33 CFR §328.3(a)(1)). This reflects the Agencies' determination that all waters meeting the definition of "adjacent" have a significant nexus to the Principal Waters, covered tributaries, and covered impoundments to which they are adjacent. *Id*. at 37069-70.

Relevant to this jurisdictional category, the Agencies have long recognized a Preamble Exclusion for "waterfilled [water-filled] depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States." 51 Fed. Reg. at 41217; 53 Fed. Reg. at 20765. The Proposed Rule contained a similar exclusion but, without explanation, omitted all reference to mining activities. *See* 79 Fed. Reg. at 22263.

The Rule, also without explanation, reinstated the reference to mining activities with language that appears broader than the current Preamble Exclusion. It excludes "water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water." 80 Fed. Reg. at 37105 (33 CFR §328.3(b)(4)(v)).

Older Gravel Pit Lake Developing Wetland Characteristics

The Agencies note that the exclusion in the Rule contains "several refinements," but is "consistent with" the existing Preamble Exclusion. *Id*. at 37099. They do not mention that the Preamble Exclusion applies "unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States." Some Corps offices interpret this language to require a sand and gravel pit to be under an active mining permit to be excluded. The Rule does not support such an interpretation. Moreover, under the Rule, once a feature falls within the exclusion the Agencies cannot recapture it under any jurisdictional category or on a case-specific basis (*see above* regarding "recapture").

Clean Water Rule

Mining Activities Exclusion

Significant aggregate production in Colorado comes from alluvial gravel deposits near streams. Mining these gravel deposits typically exposes shallow alluvial groundwater. These pits are often located close enough to streams to be considered "adjacent" under the Existing Rule or the Rule.

Municipalities and other entities frequently use mined-out sand and gravel pits for water storage, recreation, and parks and open space. Under the Existing Rule, the jurisdictional status of these features is often unclear, for example when older pits begin to display wetland characteristics.

Given the curious history of this exclusion during the rulemaking, the Agencies presumably intended to broaden the language referencing mining activities. Additionally, the exclusion in the Rule is consistent with *SWANCC*, which involved abandoned sand and gravel pits. Thus, the exclusion in the Rule appears to cover all sand and gravel pits created in dry land regardless of their permitting status, when they were excavated, or whether they develop wetland characteristics over time. This broader exclusion would be helpful to all entities that manage such features after mining is complete.

Recycling Exclusion Added

Wastewater Recycling Structures Exclusion

In response to numerous comments on the Proposed Rule, the Agencies added a new exclusion for:

> Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

80 Fed. Reg. at 37105 (33 CFR §328.3(b)(7)) (emphasis added).

Groundwater Recharge

The exclusion recognizes "the importance of water reuse and recycling," particularly in dry areas of the country "like California and the Southwest." *Id*. at 37100. The Agencies note that groundwater recharge basins, along with percolation ponds, "are becoming more prevalent tools for water reuse and recycling." *Id*. The reference to groundwater recharge basins may capture augmentation or re-timing ponds used in water resource management, but it is unclear whether this exclusion would cover such ponds if they do not use wastewater.

"Waste Waters"

The exclusion itself, and the accompanying preamble text, seem to establish this exclusion as one applicable to "waste waters." However, the reference to groundwater recharge basins in the Rule does not specify wastewater. It would also seem odd to preclude augmentation and re-timing ponds from coverage merely because they do not utilize wastewater. This exclusion is potentially helpful for certain water resource management activities in Colorado, such as those commonly employed on the lower South Platte River.

Certain Erosional Features Exclusion

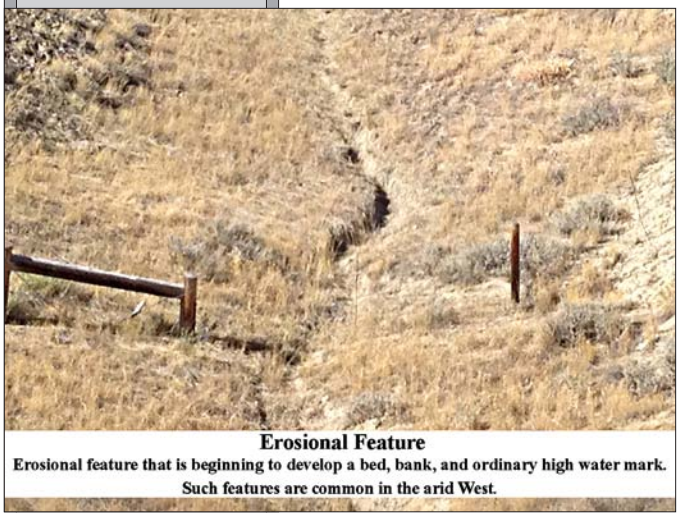
"Erosional Features"

The Rule excludes "[e]rosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways." 80 Fed. Reg. at 37105 (33 CFR §328.3(b)(4)(vi)). There is no corresponding Preamble Exclusion, though the Post-*Rapanos* Guidance contains a similar concept. *Id*. at 11-12.

While the exclusion applies to all erosional features, colloquial names do not control. For example, just because something is referred to locally as a "gully" does not mean it would be excluded from jurisdiction. 80 Fed. Reg. at 37099. The key is whether the feature has a bed, banks, and an Ordinary High Water Mark (OHWM). If it does, it is a tributary. *Id*.

"Tributary" Definition

Many have expressed concern about the CWR's potential to increase coverage of very small headwater drainages in Colorado and the Southwest. *See e.g*., Freeman and Dougherty, "New Clean Water Act Rule Defining Waters of the United States," The Colorado Lawyer 43 (September 2015). This could be an important exclusion for addressing these concerns.



Erosional Feature
Erosional feature that is beginning to develop a bed, bank, and ordinary high water mark. Such features are common in the arid West.

As written, however, this provision is really more of a clarification than an actual exclusion. Most such features, if jurisdictional, would be covered as tributaries. Thus, even absent the exclusion, if the feature does not meet the definition of a tributary (i.e., bed, banks, and OHWM), it would not be jurisdictional.

Interestingly, the Agencies acknowledge that streams in more arid parts of the country can present different issues than those in other areas. The Rule Preamble even suggests that first-order streams in arid areas may often not be jurisdictional as tributaries. 80 Fed. Reg. at 37077. Moreover, the Corps in a leaked memorandum analyzing the legal vulnerabilities of the draft final Rule, expressed concerns about the over-inclusive nature of the Rule with respect to ephemeral dry washes in the arid Southwest. *Memorandum from Lance Wood, Assistant Chief Counsel, to John W. Peabody, Deputy Commanding General for Civil and Emergency Operations, Legal*

Clean Water Rule

Lakes or Ponds

Analysis of Draft Final Rule on Definition of "Waters of the United States" (April 24, 2015), p. 4. Available at: http://www.nssga.org/wp-content/uploads/2015/07/Corps-WOTUS-PDF.pdf.

This may suggest potential legal and scientific support for a broader exclusion. A blanket exclusion for first-order streams in the arid West could significantly reduce the concerns of Colorado regulated entities regarding expansion of coverage for some ephemeral drainages.

Certain Artificial Lakes or Ponds Exclusion

An existing Preamble Exclusion applies to "artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and *which are used exclusively* for such purposes as stock watering, irrigation, settling basins, or rice growing." 51 Fed. Reg. at 41217; 53 Fed. Reg. at 20765 (emphasis added). The Rule contains a similar exclusion for "artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds." 80 Fed. Reg. at 37105 (33 CFR §328.3(b)(4)(ii)).

Artificial Pond Created in Dry Land and Used for Irrigation

The Rule removes the language about the "use" of the ponds and notes that the list is illustrative rather than exhaustive. The exclusion would apply to features constructed in dry land that do not connect to jurisdictional waters. The Agencies appear to intend that features that do connect to jurisdictional waters require a CWA Section 402 permit to be excluded. *Id*. at 37099. This exclusion can be helpful in Colorado, but it needs clarification, particularly regarding any Section 402 permitting requirement.

Connectivity to Principal Waters

Case Specific Jurisdictional Exclusion

In designating tributaries and adjacent waters as jurisdictional-by-rule, the Agencies have made sweeping generalizations about their connectivity to Principal Waters. These generalizations likely capture at least some waters that do not have a significant nexus to Principal Waters, such as certain ephemeral drainages in the southwestern United States. In fact, to support jurisdictional status for Adjacent Waters, the Agencies stated in the preamble to the Proposed Rule that such waters "are *likely, in the majority of cases*, to perform important functions for an aquatic system incorporating navigable waters." 79 Fed. Reg. 22210 (emphasis added). This statement acknowledges that in some cases, the connection is lacking.

A case-by-case exclusion — that allows an entity to show that a given jurisdictional-by-rule water is not jurisdictional because it lacks the required significant nexus to a Principal Water — would provide appropriate relief in certain circumstances, and help ease concerns of Agency overreach. If the Agencies have drawn reasonable bright lines in the Rule, these instances should be rare.

CONCLUSION

When it comes to CWA jurisdiction, the regulated community finds itself in the position of the dog that finally caught the car: it must now decide what to do with it. This will include determining whether the primary objective moving forward is killing the Rule, or effectively addressing the problem that has persisted for over 40 years.

In many regards, the upcoming rulemaking presents an unprecedented opportunity for regulated entities to shape the future of CWA jurisdiction under an administration that would be open to its concerns. This does not necessarily mean pursuing sweeping changes. While political winds seem to favor abandoning the concepts of the Rule, regulated interests should be wary of any approach that is vulnerable to challenge, or reversal by future administrations. It is not difficult to imagine a scenario where the jurisdictional issue comes full circle over the next few years and defaults back to the existing regulatory regime — which most consider flawed.

Regulated interests should evaluate their needs in the upcoming rulemaking and assess the best path forward for meeting those needs. This could involve a Scalia approach, or it could suggest a more pragmatic route. Despite its flaws, the Rule provides a workable structure for defining CWA jurisdiction while largely preserving an approach familiar to regulated interests. Entities in Colorado could gain regulatory certainty and significant regulatory relief by merely clarifying the CWR's existing exclusions. While the fix may be thornier in other parts of the country, relatively minor modifications, perhaps coupled with additional appropriately tailored exclusions, could go a long way in addressing remaining concerns.

For Additional Information:
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John Kolanz is a partner with the law firm of Otis, Bedingfield & Peters, LLC in Loveland, Colorado. He has spent over 25 years counseling clients on a broad range of environmental and natural resource law issues arising out of business operations, enforcement activities, and real estate transactions, including the permitting of large water infrastructure projects. John's career has involved serving clients both as a private sector attorney and as in-house counsel.

WATER BRIEFS

Errata
Kickapoo Tribal Water Right Agreement
Correction by Susan Metzger, Assistant Secretary Kansas Department of Agriculture

The last issue of *The Water Report* (#159*)* published an article, "State-Tribal Water Rights Settlements Update." In the Kansas section of that article, we highlighted the Kickapoo Tribal Water Right settlement (see page 22). Specially, the article stated, "Under this agreement, the parties planned to jointly develop a reservoir project and construct multiple dams to address the Tribe's water rights and needs, as well as, improve soil conservation and flood protection." This statement requires correction.

The incorrect statement was noted by one of our readers, Susan Metzger, Assistant Secretary of the Kansas Department of Agriculture. Asst. Secretary Metzger noted for *TWR* that, "Kansas and the tribe are moving forward with ratification of an agreement that quantifies the tribal water right and lays out the methods by which each party will ensure the water right is protected. The ratification of the agreement includes updating a watershed plan for the region to assess potential storage options. The agreement does not express that the parties will jointly develop a reservoir project and/or construct multiple dams." Metzger also provided a weblink to her Department for additional information about the agreement: http://agriculture.ks.gov/divisions-programs/dwr/interstate-rivers-and-compacts/kickapoo-indian-reservation.

"Communicating accurate information about the agreement is critical to the success of the ratification and implementation of the agreement," Asst. Secretary Metzger added. We agree that it is very important for *TWR* to provide the accurate background and account of the agreement. *TWR* wishes to thank her for the correction and urge any reader who spots a mistake or incorrect information to let us know so we can pass it along to our readers.

For info: Susan Metzger, 785) 564-6700 or Susan.Metzger@ks.gov

TRIBAL CULVERT CASE — WA
TREATY FISHING RIGHTS

On May 19, a panel of judges from the 9th U.S. Circuit Court of Appeals (9th Circuit) declined to hear Washington State's appeal of a 2016 federal court decision that required the state to fix salmon habitat-blocking culverts in Washington. *USA, et al. v. State of Washington*, Case No. 13-35474 (May 19, 2017). Last year's decision by a three judge panel of the 9th Circuit, affirmed a 2013 decision by Judge Ricardo Martinez which ruled that culverts built and maintained by the State violate treaty rights by diminishing salmon runs. The case was brought by 21 Washington tribes and the US against the State of Washington.

In the landmark decision in 2016, the 9th Circuit panel unanimously ruled that Native American Tribes not only have a treaty right to fish for salmon, but also that the State of Washington must restore habitat by replacing hundreds of culverts that block salmon's access to spawning streams. As noted in an article in *The Water Report* shortly after that ruling, the decision could have significant ramifications for the state and federal governments due to its recognition that treaty rights for fishing necessarily include a right to a healthy fishery. *United States v. Washington*, Case No. 13-35474 (June 27, 2016). That 9th Circuit decision found that the State's culverts violated — and continue to violate — the Tribes' treaty rights under what are known as the "Steven Treaties." The Stevens Treaties were entered in 1854–55 between Indian tribes in the Pacific Northwest and the Governor of Washington Territory. For additional background and information about the "Culvert Case," see Moon, *TWR* #110 and #149; and Mecham, *TWR* #154.

The 9th Circuit's Order of May 19, 2017 declined to reconsider the case, concluding that, "In sum, the district court properly found that Washington State violated the Treaties by acting affirmatively to build state-owned roads, and to build and maintain salmon blocking culverts under those roads. By allowing passage of water, the culverts protect the State's roads. But by not allowing passage of fish, the culverts kill the Tribes' salmon. There is ample evidence in the record that remediation of the State's barrier culverts will have a substantial beneficial effect on salmon populations, resulting in more harvestable salmon for the Tribes. As an incidental result, there will also be more harvestable salmon for non-Indians. The United States requested an injunction requiring remediation of all of the State's barrier culverts within five years. The district court crafted a careful, nuanced injunction, giving the United States much less than it requested. We unanimously concluded that the district court properly found a violation of the Treaties by the State, and that it acted within its discretion in formulating its remedial injunction." Order at 15-16. It has been estimated that fixing and replacing the State's culverts will cost $2 billion.

The May 19th Order will be of great interest due to its lengthy discussion of the decision and the impact the decision's precedent could have throughout the Pacific Northwest. As noted by a group of dissenting judges at page 18 of the Order: "Second, by holding that culverts need to be removed because they negatively impact the fish population, the panel opinion sets up precedent that could be used to challenge activities that affect wildlife habitat in other western states, which led Idaho and Montana to join Washington in requesting rehearing. The panel opinion fails to articulate a limiting legal principle that will prevent its holding from being used to attack a variety of development, construction, and farming practices, not just in Washington but throughout the Pacific Northwest."
For info: David Moon, 541/ 485-5350 or thewaterreport@yahoo.com; Order available upon request to *TWR*

PRICE OF WATER 2017 — US
ANNUAL UTILITY REPORT

Circle of Blue recently released its annual report on the value of water. The survey looks at 30 large cities — out of roughly 50,000 public water systems in the United States. The prices do not reflect average household bills, for which Circle of Blue has collected a separate data set. Instead, it shows the annual change in prices for three consumption scenarios in which monthly water use remains constant. The survey is useful for identifying broad price trends and tracking the evolution of urban residential water rates.

WATER BRIEFS

Key findings from the report include:
- The average price of water for a family of four using 100 gallons per person per day rose 4% between 2016 and 2017. For a family of four using 50 gallons per person day, the average price increased 4.6%. The median increase for both scenarios was 3%.
- Without roughly $130 million in annual revenue from MOST, a 1% sales tax used for water and sewer projects, Atlanta would have to increase water rates by 25% over the next three years. This alternative to rate increases has broad support, garnering more than 70% of the vote the three times it has been reauthorized.
- Water use per person in Los Angeles is down 20% since 2014. The Los Angeles Department of Water and Power will invest $6.3 billion in the next five years on a package of water infrastructure projects that are designed to reduce the city's reliance on water imported from northern California and the Colorado River. Projects include pump stations, cleaning up contaminated groundwater basins that can be used for underground water storage, water recycling facilities, and controlling dust in the Owens Valley, where the 223-mile Los Angeles aqueduct begins.
- Baltimore abandoned a minimum billing model which required residents to pay for a certain amount of water — 7,480 gallons every three months — even if they didn't use that much. The minimum billing model was eliminated because it was seen as harmful to the poor.

The Report also addresses what it calls "Conservation Consternation." Selling less of their product has proven difficult for some utilities since revenue is tied to consumption. Among other issues, an ongoing debate in utility finance is the proper split between fixed and variable charges. Fixed charges are paid every month, regardless of water consumption, while variable charges are tied to how much water flows through the tap. Austin Water is at the forefront of a new type of fixed charge, tied to consumption. The utility has a $7.10 per month fixed rate that every customer pays and also charges a fixed rate based on consumption. Households that use less than 2,000 gallons in a month pay only $1.25 for this charge; those that use up to 6,000 gallons pay $3.55. At this point the charges start to soar, providing an incentive to conserve. Households using up to 11,000 gallons pay an additional $9.25. If use is above 11,000 gallons, the rate is $29.75. Though the consumption-based fixed charge was instituted to stabilize revenue, Austin Water has seen a decrease in peak demand as well, said Jill Mayfield, a spokeswoman. The decrease could be attributed to higher fixed charges, overall price increases, or conservation programs, she said.

Circle of Blue's full report on US water pricing is available at their website shown below.

For info: Report available at: www.circleofblue.org/2017/water-management/pricing/price-water-2017-four-percent-increase-30-large-u-s-cities/; Brett Walton, Circle of Blue, www.circleofblue.org/contactbrettwalton/

CLIMATE DATABASE WEST

WESTERN STATES SERVICES

More than 130 public sector and nonprofit organizations provide climate services to the eleven western states, yet until now there has been no centralized resource to connect climate information users with the wide array of information and services available. The NOAA Western Region Climate Service Providers Database is a searchable directory of climate service providers in the west that makes climate services easier to find. Its powerful search function allows users to customize their search based on the type of service, the geographic area, stakeholders served, and several additional parameters. This resource was created through a partnership between NOAA Western Regional Collaboration Team, the NOAA-RISA Western Water Assessment and the NOAA-RISA Climate Assessment for the Southwest.

This database is a pilot and the creators appreciate comments and suggestions from users. Send any comments to csproviders@dri.edu. For more information about this project and initial findings from a landscape assessment of climate providers in the west, please refer to the preliminary analysis report.

For info: wwa.colorado.edu/

RECYCLING & REUSE WEST

RECLAMATION AWARDS

The US Bureau of Reclamation (Reclamation) has awarded $23,619,391 to communities in seven states for: planning, designing, and constructing water recycling and re-use projects; developing feasibility studies; and researching desalination and water recycling projects. The funding is part of the Title XVI Water Reclamation and Reuse program. "This funding provides essential tools for stretching limited water supplies by helping communities reclaim and reuse wastewater and impaired ground or surface waters," said Secretary Zinke.

Title XVI Authorized Projects are authorized by Congress and receive funding for planning, design and/or construction activities on a project-specific basis. Six projects will receive $20,980,129:
- City of Pasadena Water and Power Department (CA), Non-Potable Water Project, Phase I, $2,000,000
- City of San Diego (CA), Area Water Reclamation Program, $4,200,000
- Hi-Desert Water District (CA), Wastewater Reclamation Project, $4,000,000
- Inland Empire Utilities Agency (CA), Lower Chino Dairy Area Desalination and Reclamation Project, $5,199,536
- Padre Dam Municipal Water District (CA), San Diego Area Water Reclamation Program, $3,900,000
- Santa Clara Valley Water District (CA), South Santa Clara County Recycled Water Project, $1,680,593

Title XVI Feasibility Studies are for entities that would like to develop new water reclamation and reuse feasibility studies. Thirteen projects will receive $1,791,561.

The Title XVI Program will provide funding for research to establish or expand water reuse markets, improve or expand existing water reuse facilities, and streamline the implementation of clean water technology at new facilities. Four projects will receive $847,701:
- City of San Diego (CA), Demonstrating Innovative Control of Biological Fouling of Microfiltration/ Ultrafiltration and Reverse Osmosis Membranes and Enhanced Chemical and Energy Efficiency in Potable Water, $300,000
- City of San Diego (CA), Site-Specific Analytical Testing of RO Brine Impacts to the Treatment Process, $48,526

WATER BRIEFS

- Kansas Water Office (KS), Pilot Test Project for Produced Water near Hardtner, KS, $199,175
- Las Virgenes Municipal Water District (CA), Pure Water Project Las Virgenes-Truinfo Demonstration Project, $300,000

For info: www.usbr.gov/watersmart/title

FRACKING MORATORIUM CA BLM SETTLEMENT

Conservationists have compelled the Trump administration to halt plans to open more than one million acres of public land and mineral estate in California to oil drilling and fracking, preserving a four-year-old moratorium on leasing federally owned land in the state for oil and gas development. The legal settlement, filed May 3, resolves a lawsuit brought by the Center for Biological Diversity (CBD) and Los Padres ForestWatch, represented by Earthjustice. The agreement requires the Bureau of Land Management (BLM) to rework a resource-management plan that would have auctioned off drilling rights on vast stretches of public land in California's Central Valley, the southern Sierra Nevada, and Santa Barbara, San Luis Obispo and Ventura counties. "Pending issuance of the new decision document [to be prepared by BLM], Defendants [BLM] agree to not hold any oil or gas lease sales within the Bakersfield RMP decision area." *Los Padres ForestWatch et al. v. U.S. Bureau of Land Management*, Case No. CV-15-4378-MWF-JEM, Settlement Agreement at 2 (May 3, 2017).

BLM has not held a single lease sale in California since 2013, when a federal judge first ruled that the agency had violated the National Environmental Policy Act by issuing oil leases in Monterey County without considering the environmental dangers of fracking. The new settlement will continue that de facto leasing moratorium as noted above. The settlement requires BLM to complete a new analysis of the pollution risks of fracking, which blasts toxic chemicals mixed with water underground to crack rocks.

Concerning the public lands at issue in the lawsuit and settlement, the federal district court noted that, "[B]elow ground, the Decision Area also encompasses numerous groundwater systems that contribute to the annual water supply used by neighboring areas for agricultural and urban purposes," a federal judge noted last year. *Los Padres ForestWatch et al. v. U.S. Bureau of Land Management*, Case No. CV-15-4378-MWF (JEMx), Civil Minutes at 3 (Sept. 6, 2016); available upon request from *TWR*. The federal court also noted the issues regarding fracking: "The use of fracking has increased dramatically in recent years, and this trend is expected to continue. Fracking raises a number of environmental concerns, including risks of groundwater contamination, seismicity, and chemical leaks. Although the parties disagree as to whether these concerns are well-founded, the Bureau acknowledges that fracking is, at a minimum, a controversial national issue." (citations omitted) *Id*.

CBD's press release also referred to a 2015 report from the California Council on Science and Technology and the Lawrence Berkeley National Laboratory, "*An Independent Scientific Assessment of Well Stimulation in California*" (2015). CBD's press release stated that the report concluded that fracking in California happens at unusually shallow depths, dangerously close to underground drinking water supplies, with unusually high concentrations of chemicals, including substances dangerous to human health and the environment. That 2015 report is specifically oriented to fracking in California and includes multiple conclusions and recommendations. The report is available upon request from *TWR*.

For info: Patrick Sullivan, CBD, 415/ 517-9364 or psullivan@biologicaldiversity.org; Greg Loarie, Earthjustice, 415/ 217-2000

INTERBASIN TRANSFERS WEST SURVEY OF THE WEST

The Texas Water Journal, an online journal devoted to the timely consideration of Texas water resources management, research, and policy issues, has recently published "*Water Barons for the Water Barren? A Survey of Interbasin Water Transfer Laws in Western States*" by Brad Castleberry and Ashleigh Acevedo, of Lloyd Gosselink Rochelle & Townsend in Austin, Texas.

Interbasin transfers of water have become an increasingly popular water management tool — especially among the western states — to address vulnerability to water shortages in those regions susceptible to widely fluctuating drought conditions and population growth. Such transfers offer a practical resolution to the geographic limitations and disparate distribution of water availability. The regulatory frameworks for interbasin transfers adopted across western states, however, vary rather drastically in balancing the practicality of interbasin transfers with equity to the basin of origin. Like many of its counterparts, Texas has adopted an interbasin transfer statute — Texas Water Code § 11.085 — that includes common elements of interbasin transfer regulations aimed at maintaining this balance, including protecting the basin of origin, requiring a distinct demonstration of purpose and need, maintaining existing water rights, and promoting the public interest.

The report also focuses in on the Texas situation and discusses what the future holds for that state in particular. In comparison to other western states, Texas has a relatively strict framework for interbasin transfers that does not always facilitate the use of such transfers when it is otherwise pragmatic to do so. Policymakers and stakeholders in Texas should thus consider whether and to what extent the balance struck by interbasin transfer laws of other western states is appropriate for Texas and more conducive to using interbasin transfers as a water management strategy across the state.

"This article establishes a framework within which policymakers and stakeholders can consider a reformation or, at the very least, a reevaluation of the Texas IBT laws. Specifically, this article analyzes and compares commonly recurring elements of the legal framework for IBTs [interbasin transfers] among western states facing similar water constraints as Texas: Arizona, California, Colorado, Idaho, Nevada, New Mexico, and Oregon. This comparative analysis is intended to demonstrate how these western states facilitate or impede IBTs through prioritization of protecting the basin of origin, requiring a distinct demonstration of purpose and need, maintaining existing water rights, and promoting the public interest, among others." Survey at 31-32.

For info: texaswaterjournal.org

WATER BRIEFS

INFRASTRUCTURE NW

NORTHWEST *WATER VISION 2040*

Much of the Pacific Northwest's water infrastructure is old, at risk for breakdowns, and vulnerable to threats including earthquakes and climate extremes, according to a new report. "*A Northwest Vision for 2040 Water Infrastructure: Innovative Pathways, Smarter Spending, Better Outcomes*" — released April 11th by The Evergreen State College's Center for Sustainable Infrastructure — was developed with collaboration of 50 industry experts spanning water supply, wastewater, and stormwater infrastructure. The Report explains how the region can develop cost-effective, integrated water systems that are among the most sustainable and resilient in the world. To achieve that goal, investment strategies will be required that break down silos within the water sector and build new partnerships beyond it, the report concludes. It offers working examples in the Northwest and beyond.

"Current spending to operate and maintain water infrastructure totals more than $3 billion a year in Washington and Oregon alone, but existing funds are unlikely to be enough to replace the vast network of aged pipes, pumps, and treatment facilities originally installed 40 years and more ago. Many assets are nearing or beyond their expected lifespan, leading to roughly 240,000 water main breaks and between 23,000 and 75,000 sanitary sewage overflows per year in the United States," the National Infrastructure Advisory Council says. The Council puts the investment gap at $400 billion to $1 trillion nationwide.

Climate disruption is changing rainfall and water supply assumptions on which long-term investment decisions are made. Northwest utilities face the added challenge of earthquakes. New approaches can save money for the local utility, and also offer multiple benefits for health, environment, prosperity, and community.

The Report examines:

- "Net water positive" buildings that capture, treat and recycle water on site;
- Green infrastructure investments, from rain gardens, street bioswales, and engineered wetlands to broader watershed restoration measures; and
- Smart devices diffused throughout systems that provide managers with new tools to control flows.

The Report highlights a wide range of leadership examples, such as Portland's Bureau of Environmental Services, which saved $63 million on a sewer overhaul project with green infrastructure, much of it on customer properties. The small rural community of Orting, Washington — facing an urgent need to replace aging dikes and levees — developed a cost-effective strategy to restore natural river flow and wetlands, resulting in not only improved flood protection, but better habitat for salmon, and new green space and recreational trails for the community.

The report also recommends cost-sharing agreements that leverage multiple interests in green infrastructure, from water to recreation, wildlife and health. The report points to a leading example, Clean Water Services (CWS) of Hillsboro, Oregon. CWS averted a $60-$150 million treatment plant investment with a streamside restoration investment into which it put $4.3 million, while drawing millions more from state and federal partners with water and wildlife interests.

For info: Center for Sustainable Infrastructure, The Evergreen State College at: http://evergreen.edu/csi

SALMON RESILIENCY CA

RECOVERY PLAN RELEASED

The California Natural Resources Agency (CNRA) announced on June 2 that it was launching an aggressive strategy to aid salmon and steelhead in the Sacramento Valley. With the latest science showing that nearly half of California's native salmon and trout species face extinction in the next 50 years, state agencies have committed to a suite of actions to improve survival rates, including restoring habitat, improving stream flow, removing stream barriers and reintroducing species to ideal habitat. These actions are described in a Sacramento Valley Salmon Resiliency Strategy released June 2.

The Strategy addresses near- and long-term needs of Sacramento River runs of sea-going fish, focusing primarily on endangered winter-run Chinook salmon, threatened Central Valley spring-run Chinook salmon and threatened Central Valley steelhead. Five years of drought from 2012 through 2016 worsened conditions, and Governor Brown Jr. on May 24 asked the federal government to declare a catastrophic regional fishery disaster and commercial fishery failure in the California.

Under the Strategy, the State will, among other actions:

- Improve flows in the relatively pristine Sacramento River tributaries of Mill, Deer, Antelope, and Butte creeks
- In coordination with the Bureau of Reclamation, complete the Battle Creek Restoration Project, which involves, among other measures, removal of a dam on the south fork
- Reintroduce winter-run Chinook salmon to Battle Creek and the McCloud River
- Remove a small rock dam on the Feather River to improve fish passage
- Restore off-channel rearing habitat in the middle and upper Sacramento River
- Improve passage of adult salmon through the Sutter and Yolo bypasses, which in some ways mimic natural Sacramento River floodplain
- Increase the frequency and duration of Yolo Bypass inundation
- Restore tidal habitat in the Sacramento-San Joaquin Delta

Separately, as directed by the Governor, state agencies are working to achieve voluntary settlements among water users along the Sacramento and San Joaquin rivers and tributaries. The State's aim is to have water districts that divert from these streams reach agreements that improve flow, stream temperature, and habitat conditions for salmon and steelhead. Such voluntary agreements could serve as a possible mechanism to help implement objectives set by the State Water Resources Control Board (Water Board), which oversees water rights and water quality. The Water Board is in the process of updating its 20-year-old water quality plan for the Sacramento-San Joaquin Delta and San Francisco Bay, which involves, for example, setting standards for salinity and requiring seasonal flows of certain levels.

For info: CNRA website at: http://resources.ca.gov/sacramento-valley-salmon-resiliency-strategy/

CALENDAR

June 14-16 CA
Bay-Delta Tour 2017, Delta. Sacramento-San Joaquin Delta. Presented by Water Education Foundation. For info: http://www.watereducation.org/tour/bay-delta-tour-2017

June 15 WA
Celebrate Water - Center for Environmental Law & Policy Annual Fundraiser & CLE Workshop: Mitigation of Domestic Water Use: Requirements & Practical Experience, Seattle. Ivar's Salmon House, 5:30-7:30 pm; CLE Workshop 4-5 pm. For info: CELP, http://celebratewater2017.bpt.me/ or http://celp.org

June 15-16 CA
California Wetlands Conference, Los Angeles. InterContinental Century City. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

June 16 CA
10th Annual Orange County Water Summit: Finding New Water Supplies, Anaheim. Grand California Hotel at Disneyland. For info: www.ocwatersummit.com/

June 20 OR
Managing Stormwater in Oregon: The Business of Stormwater Regulation & Compliance, Portland. Red Lion Hotel on the River - Jantzen Beach. Presented by the Northwesst Environmental Business Council. For info: www.nebc.org/ or www.stormwaterconf.com/or17/

June 20 NE
Republican River Basin-Wide Water Management Plan Meeting, Cambridge. Cambridge Community Center, 722 Patterson Ave. Hosted by Nebraska Dept. of Natural Resources. For info: http://dnr.nebraska.gov/RRBWP/project-and-meeting-schedule

June 20-22 NM
2nd Annual Conference on Environmental Conditions of the Animas & San Juan Watersheds (Gold King Mine & Mine Waste Issues), Farmington. San Juan College, Henderson Fine Arts Center. Presented by New Mexico Environment Department. For info: https://animas.nmwrri.nmsu.edu/2017/

June 21 TX
Dam Safety Workshop, Decatur. Decatur Civic Center. Presented by Texas Commission on Environmental Quality. For info: www.tceq.texas.gov/p2/events

June 22 WEB
Net Blue: Supporting Water - Neutral Community Growth WEBINAR, 9 am PDT. Presented by Alliance for Water Efficiency, the Environmental Law Institute & River Network. For info: www.allianceforwaterefficiency.org/net-blue-webinar.aspx

June 22-23 WA
Clean Water & Stormwater: Executive Orders & About Face on Fed Policies, Adaptation at the State Level & What's Next Conference, Seattle. Washington State Convention Ctr. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

June 22-23 NV
19th Annual Law of the Colorado River Conference, Las Vegas. Caesars Palace. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

June 26-30 MT
Environmental Justice in Indian Country - Summer American Indian & Indigenous Law Program, Missoula. University of Montana, School of Law. Course with CLE Options. For info: umt.edu/indianlaw

June 27 CA
Update on Federal Columbia River Power System Litigation (Brownbag), Portland. Stoel Rives, 760 SW Ninth Avenue, Noon - 1 pm. For info: RSVP by 6/22 to: marua@drag.org

June 27-29 CA
Western States Water Council Meeting - Summer 2017 (184th), Rohnert Park. DoubleTree by Hilton Sonoma-Wine Country. For info: WSWC, www.westernstateswater.org

June 27-29 LA
One Water Summit 2017, New Orleans. InterContinental New Orleans. Presented by US Water Alliance. For info: http://uswateralliance.org/summit/one-water-summit-2017

July 9-10 CA
Sustainable Groundwater Planning in California Seminar, Sacramento. Marriott Courtyard Sacramento Cal Expo. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 12 TX
Dam Safety Workshop, Tyler. Ornelas Activity Center, University of Texas at Tyler. Presented by Texas Commission on Environmental Quality. For info: www.tceq.texas.gov/p2/events

July 17 NM
Using Hydrology as Proof in Water Cases Seminar, Santa Fe. La Fonda Santa Fe Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 18-19 NM
Natural Resource Damages Conference, Santa Fe. La Fonda Santa Fe Hotel. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

July 18-20 England
IWA's Efficient 2017 Conference, **Somerset**. University of Bath's Chancellor's Hall. Presented by the International Water Assoc. For info: http://efficient2017.com/registration/

July 20 HI
Hawaii's Shoreline Seminar: Legal & Regulatory Issues, Sea Level Rise & Adaptation, Honolulu. Hilton Waikiki Beach. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

July 20-22 NM
Rocky Mt. Mineral Law Foundation 63rd Annual Institute, Santa Fe. Eldorado Hotel & Spa. For info: www.rmmlf.org

July 25-26 WA
Water Law in Washington Seminar, Seattle. Washington State Convention Ctr. For info: Law Seminars Int'l, 206/ 567-4490 or www.lawseminars.com

August 8-10 NM
Western Water Seminar, Santa Fe. El Dorado Hotel & Spa. Presented by National Water Resources Assoc. For info: www.nwra.org/upcoming-conferences-workshops.html

August 8-10 MT
Symposium on the Settlement of Indian Reserved Water Rights Claims: Completed & Onoging Negotiated Settlements, Great Falls. Best Western Plus Heritage Inn. Presented by the Western States Water Council and the Native American Rights Fund. For info: www.westernstateswater.org

August 15-19 WA
The Council of State Governments West Annual Meeting: Innovation is Our Nature, Tacoma. Hotel Murano, 1320 Broadway. For info: http://www.csgwest.org/annualmeeting/default.aspx

August 24-25 AZ
Arizona Water Law Conference: Balancing the Rights & Interests of All Arizonians, Scottsdale. Hilton Scottsdale. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

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CALENDAR

(continued from previous page)

September 10-11 Israel
Cutting-Edge Solutions to Wicked Water Problems Conference, Tel Aviv. Tel Aviv University. Sponsored by American Water Resources Assoc. & Water Research Center at Tel Aviv University. For info: http://www.awra.org/meetings/Israel2017/

September 11-12 NM
25th Anniversary SuperConference - New Mexico Water Law: The History & Future of Our Water Resources, Santa Fe. La Fonda Hotel. For info: CLE Int'l, 800/ 873-7130 or www.cle.com

September 11-13 WY
The Environmental Council of States Fall Meeting, Jackson. Snow King Resort. For info: www.ecos.org/event/2017-ecos-fall-meeting/

September 13 WA
Emerging Issues in Water Quality Regulations Seminar, Seattle. Hilton Garden Inn Downtown. For info: The Seminar Group, 800/ 574-4852, info@theseminargroup.net or www.theseminargroup.net

September 17 WA
Washington Environmental Cleanup: CERCLA & MTCA, Seattle. Washington State Convention Ctr. For info: Environmental Law Education Center, www.elecenter.com/

September 17-21 TX
EPA Region 6 Stormwater Conference and LID Competition, San Antonio. Hilton Palacio. Organized by EPA Region 6, in partnership with San Antonio, Texas, Texas A&M University Kingsville, Municipal Separate Storm Sewer Systems (MS4s), and States.. For info: Nelly Smith, EPA, smith.nelly@epa.gov

September 18-20 AUST
10th International Riversymposium and Environmental Flows Conference: Sustainable River Basin Management, Brisbane, Australia. Presented by International River Foundation. For info: http://riversymposium.com/

September 18-20 NV
WaterPro Conference - Annual Conference of the National Rural Water Assoc., Reno. Grand Sierra Resort. For info: http://waterproconference.org/

September 20 TX
Pollution Prevention Waste Management Workshop, Austin. J.J. Pickle Research Campus, University of Texas at Austin. Presented by Texas Commission on Environmental Quality. For info: www.tceq.texas.gov/p2/events

September 25-27 CA
CASQA in the Capital: Building Bridges for Water: California Stormwater Quality Association (CASQA) Annual Conference, Sacramento. Sacramento Convention Center. For info: www.casqa.org/events/annual-conference/hotel-and-travel