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

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RECLAMATION MANAGEMENT GUIDELINES

AN INTERVIEW WITH

CARLY JERLA, SENIOR WATER RESOURCES PROGRAM MANAGER, US BUREAU OF RECLAMATION

Interviewer: Jay Weiner, Rosette LLP (Sacramento, CA)

Introduction

In June 2021, Carly Jerla was named the US Bureau of Reclamation's (Reclamation's) Senior Water Resources Program Manager responsible for overseeing the Department of Interior's efforts to develop the post-2026 management framework for the Colorado River Basin.

Several operational rules and agreements — both within the United States and between the United States and Mexico — that govern the operation of Lake Powell and Lake Mead expire at the end of 2026. They will need to be extended, modified, or replaced.

On June 24, 2022, Reclamation published a pre-scoping notice in the Federal Register requesting public input on how it should go about developing the post-2026 management framework, as well as on the substantive elements of the framework, with a comment period that closed on September 1, 2022.

This interview presents Ms. Jerla's perspective on the pre-scoping process and potential next steps as Reclamation moves to commence the formal scoping process to develop the post-2026 management framework as required by the National Environmental Policy Act (NEPA).

Participants

Carly Jerla's career with Reclamation began in 2005 while a graduate student at the University of Colorado's Center for Advanced Decision Support for Water and Environmental Systems. There she led a Modeling and Research Team responsible for research and development of modeling applications and decision support for water operations and planning in the Colorado River Basin. She worked intensively on the development of the Colorado River 2007 Interim Guidelines, the 2012 Colorado River Basin Water Study, and the 2019 Colorado River Drought Contingency Plan (DCP), among other projects. Ms. Jerla holds a Bachelor of Science degree in civil and environmental engineering and engineering and public policy from Carnegie Mellon University and a Master of Science degree in civil engineering from the University of Colorado.

Jay Weiner is Of Counsel to the majority Indian-owned law firm Rosette LLP, where he represents tribes and tribal governments on water, the Endangered Species Act, and other natural resources issues. He is also employed half-time as an administrative law judge for the Montana Department of Natural Resources and Conservation, hearing appeals of agency decisions regarding water rights permit and change applications, cabin site sales, and agricultural and grazing leases. He represents tribal clients in the Colorado River Basin, but the perspectives expressed in this article are his own.

Reclamation

Carly Jerla

The Water Report
(ISSN 1946-116X)
is published monthly by
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Tucson, AZ 85745

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website:
www.TheWaterReport.com

Subscription Rates:
$299 per year
Multiple & Electronic
Subscription Rates Available

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Interview

Jay Weiner (**JW**): Thanks for taking the time to visit with me today. In June, Reclamation put out its Pre-Scoping Notice and asked for comments. What was Reclamation's intent behind issuing that notice and what were your hopes and goals for the comments you might receive?

Carly Jerla (**CJ**): Glad to be here. I want to start by reiterating that pre-scoping is not a formal NEPA phase although it sounds like it could be one. "Pre-scoping" was our shorthand way of describing the Notice because it precedes our formal scoping process, which will begin with publication of Notice of Intent [to prepare an Environmental Impact Statement (EIS)]. We used it to get a jump-start on receiving external perspectives to help shape the way we initiate our formal launch of the post-2026 process. Our intent behind issuing the Pre-Scoping Notice was two-fold. First and foremost, it was to receive public input on both the process through which the post-2026 framework would be developed and the substance of what ought to be included in that framework. But it was also to put a marker down about the dire situation we're currently facing in the Basin. In the Notice, we made some fundamental observations about changed circumstances since 2007 [when the Interim Guidelines that currently govern Colorado River reservoir operations were adopted], particularly about hydrology, and also stakeholder and partner engagement. A key part of the evolving stakeholder engagement relates to Tribal inclusion and how that needs to be done differently and better for the post-2026 process than has happened in the past. We also recognize that Minute 323 [under the 1944 US-Mexico Treaty] expires in 2026 and so we will need to be working with Mexico in parallel with the domestic processes on the successor to that Minute. We thought it was important to make those key observations because we wanted specific input that built from those key points.

JW: How did the comments you received match up with those goals?

CJ: We received over 50 very thoughtful partner letters, over 100 different citizen letters, which reinforced what we already knew — that we're dealing with a very sophisticated stakeholder base that has lots of ideas on how to build a process and on what needs to go into the mix to build a sustainable, reliable paradigm going forward. It's a little sobering reading all that and thinking about what this effort needs to encompass and how important it is to get this right.

JW: I appreciate that — there's a lot there. One of the things I'm curious about is what you and Reclamation see as some of the key themes emerging from the comments.

CJ: Key themes on the process side include the need for clear, timely, effective communication. Those adjectives are easy to toss around but when you really unpack how to do those things, there's a lot in there to get it right. Also, process-wise, in 2007 Reclamation worked more with singular interest group-built alternatives, and comments suggested that we need to better integrate a diverse set of groups and interests to find synergies. Many observers commented that we need to build robust stakeholder engagement around both the alternative development and the resource analysis aspects of the NEPA process. From the substantive elements standpoint, there was a lot of emphasis on the need for sustainable, reliable, durable, adaptable policies going forward so we don't find ourselves in this rhythm we've been in since 2013 of looking ahead to the risks, realizing our current agreements aren't robust enough, and trying to build the next set only to find out that's not good enough either. Looking at the comments, we are well aware of the difficulty of coming up with a plan capable of handling every scenario that's out there. The comments emphasized the need to land on something that is more robust to maybe give ourselves a little break from the cycle of crises we've been in. Themes reflecting the need to explore operational paradigms beyond Lake Powell/Lake Mead reservoir elevation-based triggers for decisions (such as triggers based on combined storage or inflows) were also prevalent. We are working on a summary report that will describe the input thematically and provide a sort of a roadmap for how the input will be integrated and we plan to publish that report prior to the formal initiation of the NEPA process.

National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions.

Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. Agencies also provide opportunities for public review and comment on those evaluations.

NEPA Title 1 Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as Environmental Impact Statements (EIS) and Environmental Assessments (EA).

See: www.epa.gov/nepa/what-national-environmental-policy-act

Basin Governance

NEPA Process

JW: In the comment letters, multiple stakeholders talked about the need for a more robust and collaborative basin governance framework. A couple of the letters went so far as proposing a single authority for the entire Basin. Does Reclamation see a place for having conversations about that sort of thing within the scoping of alternatives that will be encompassed by the NEPA process? And, if not, how does Reclamation envision those sorts of discussions taking place and their consensus solutions, if any, being implemented?

CJ: It's hard to say, not knowing the outcome of the scoping process yet. In a general sense, the NEPA process will guide us through the design of the action, evaluating its performance, and its adoption through a Record of Decision, which will describe implementation. The number of different interests who are involved in the development of, and have water at stake from, those operations will inform the process used to implement the action. Reclamation's process used to implement operations through

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its Annual Operating Plan is an open and public process that we will continue to use to implement and document our operations on an annual basis. But in terms of provisions within operational agreements about consultation — for example, who we are consulting with and how that might work — will be informed by how that action is ultimately defined in the NEPA process.

Core Issues

JW: Does Reclamation have any preliminary thinking about how to engage with those issues that may not be squarely on the table in the NEPA process but that will need to move in parallel in some fashion?

CJ: I think it's too early to tell. Step 1 is really unpacking with entities across the Basin on what their core sets of issues are. That's something we wanted to draw out through the pre-scoping notice. We're very pleased with the way the commenters responded to that, in letting us know what stakeholder/partner X is concerned about. But in designing the process, there will need to be a series of conversations with different partners to understand what it is that has to be in the package — from their particular perspective — to move the post-2026 process along. The commonalities will help shape the package and help define which parts of the package have to be pursued in different lanes. We have some indications about some of those things, but more discussions are needed to start to shape what's in what lane and how that all connects to the NEPA process.

Parallel Track

JW: That sounds challenging. Some commenters encouraged a focus exclusively on Lake Powell and Lake Mead operations, others called for a very broad suite of issues to be squarely on the table, and still others viewed complicated issues such as the settlement of Indian water rights claims or the challenges facing the Salton Sea as needing to be coordinated with the NEPA process but that really need to be moving in parallel. Does Reclamation have any preliminary thoughts about what it would see falling into what categories? And, if not, how and when would you anticipate making some of those decisions about the breadth of what might be on the table?

CJ: Again, we haven't made any determinations there. At a minimum, we need to be addressing the Powell and Mead operations and if that's all we do, then those other areas that were identified need to be addressed in a meaningful and timely manner. Figuring out how these various concerns are addressed is one of our key tasks in the months and years ahead.

Common Interests

JW: Another thing that stood out to me from the comments (and obviously the municipal folks were really big on this, but it was not just unique to them) was this idea of trying to come up with sector-driven pathways for addressing communities of common interests that don't necessarily align with traditional state lines of even Upper Basin/Lower Basin divisions. Traditionally, the Basin States have been responsible for herding their own cats and Reclamation has largely worked directly with the Basin States as the primary interlocutors in developing management frameworks. But given the breadth of the comments and some of the hydrologic challenges we're facing, it appears the old ways of doing business have not kept us in a sustainable place. Is that a direction Reclamation is interested in going in and, if so, do you have thoughts about what a different model might look like?

Law of River Flexibility

CJ: The short answer is that I do not have a particular approach or model to endorse or recommend at this time. But this Basin has proven time and time again that it can, if not redefine the Law of the River, agree to find flexibilities within the legal framework, at least for a temporary period, if there is a consensus to do so. That was the purpose of the interim period — identify a flexible framework and assess it over a meaningful period of time. We see the critical role Reclamation plays as facilitating dialogue to get those interests together to allow creative thinking that can get put into our process. We don't want a traditional siloed approach to thinking about these operational alternatives. We are putting a lot of thought into building a structure that accommodates a lot of the ideas in the comments regarding process. But the other thing that we've been encouraging throughout the years is for stakeholder groups to work together and think about different pathways forward. I think about remarks from federal officials at past [annual meetings of the Colorado River Water Users Association] or past [Water Education Foundation Colorado River Symposia] Santa Fe conferences — a reoccurring message is stressing the importance of broad participation and inclusivity, encouraging stakeholders to continue to work together brainstorming ideas to feed into the next federal process.

Broad Participation

Time Horizon

JW: Something else I saw in the comments, and this came through most clearly from the municipal sector, was the difference between the planning horizon municipal providers need to make decisions on and the operational timeframes that Reclamation uses to identify shortages for the coming year off the August 24-month study. One of the things municipal providers said pretty consistently in the comments is that they can't plan on a time horizon that short. But obviously, because so much of the system and the available water is snowpack driven, and therefore there is that much interannual variability, does Reclamation have any even preliminary thoughts on whether that's a circle that can get squared?

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Differing Timescales

CJ: I agree with the way you framed that. But one of the good things about the 2007 Interim Guidelines is that they were interim. Had they been permanent, it would have been that much harder to make some of the adjustments we have had to make over the past 15 years. I've seen from a lot of the comments that people want to go further than 20 years this time around. Given our past experience, I don't think we want a 50-year locked in set of rules that we can't deviate from either. I do recognize, though, that different sectors need different levels of certainty because they're planning on different timescales. I would point to a couple of our past processes where we have done differing timescales on different elements, so it can depend on the nature of the particular element. In 2007, for example, we extended the ability to withdraw ICS (Intentionally Created Surplus) through 2036 because entities were concerned about "stranded" ICS. Although most provisions of the DCP (Drought Contingency Plan) expire in 2026, the storage space available for Upper Basin demand management exists in perpetuity because the Upper Basin needed that certainty to begin developing a demand management program. So I think we have some flexibility to put different provisions on different timelines if needed without locking ourselves in too much from a big picture perspective.

Intentionally Created Surplus (ICS)
ICS may be created through projects that create water system efficiency or extraordinary conservation or tributary conservation or the importation of non-Colorado River System water into the Colorado River Mainstream. …ICS is conditioned upon execution of Forbearance Agreements and Delivery Agreements… .
Source: 2007 Interim Guidelines

Short-Term Stabilization

JW: Then there's what I think of as the flip side of that coin. There are all the efforts that are being undertaken for short-term system stabilization — the efforts to find the two-to-four MAF (**m**illion **a**cre **f**eet) Commissioner Touton referenced [in her June 14, 2022, Senate Energy and Natural Resources Committee testimony] and the scramble that's going on right now to avoid Lake Powell dropping below minimum power pool or Lake Powell and Lake Mead getting to dead pool. This is an acute crisis and it's going to take doing something different than we've been doing in the past to get through, although it's taking a while to coalesce around what that might be. How do those efforts synch up with the process for the post-2026 framework and do you see a point at which those two things might need to essentially collapse into each other?

Climate Change

CJ: The way we're thinking about it is a recognition that there's a paradigm shift that needs to happen in this Basin. Our pre-scoping notice clearly points out that climate change and hydrology have shown themselves and demonstrated to us that we cannot plan for a return to the way things were before. Our near-term action is trying to grapple with the here and now, while the post-2026 effort is geared toward changing our operations and the way we use water into this new paradigm. The near-term is a bridge, and the post-2026 framework will determine how we operate and function in a different way in this changed world. It's essential to us to keep the post-2026 process on track and moving, and we will do so. Whatever we come up with in the near term to deal with the current situation may well get mapped into the post-2026 framework and moved into the longer term if it makes sense to do so. We see this as a prudent approach. That said, if we keep having these types of years, or worse, we may have to react differently. But from where we sit today, we see it as a way to bridge ourselves into the new paradigm post-2026.

Post-2026

JW: Is there a role for Bipartisan Infrastructure Law (BIL) or Inflation Reduction Act (IRA) funding to support the post-2026 management framework and what might that look like?

CJ: Yes, I think that funding is going to be critical in helping to form that bridge to post-2026. A lot of the comments recognized the need for some kind of sustainable funding stream depending on what the size of the post-2026 package is. I think that will be an important discussion to have.

Priority System

JW: Reclamation received comments requesting protection for municipal water users, for tribal water rights, for environmental and recreation flows, for agricultural users, for hydropower production. Unless we suddenly return to an extended unexpectedly wet period, it seems impossible to accomplish all those things simultaneously. In theory, the priority system is what was designed to mediate those allocation challenges. But very few people seem comfortable with going that route and, practically speaking, taking the Central Arizona Project to zero or drying up the Grand Canyon seem like politically untenable options. What other ideas does Reclamation have in the event that there is not a consensus that can be coalesced around if it's not simply going to enforce priority cuts to deal with the need to manage less water?

CJ: Those are hard questions. They are staring us right in the face today, given where the system is and its inability to handle another dry year. I think how successful we are in addressing these near-term challenges will set the stage for how successful we can be in the long term. We want to facilitate a process to have innovative thinking, and where there's a consensus, this Basin has shown that the Law of the River can adapt.

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"Consensus"

Other Perspectives

JW: I wonder about the word "consensus." My impression is that, at least when it comes to interpreting the Law of the River, it usually means "consensus of the Basin States." How might the federal decision-making process look if you've got a whole bunch of different sectors or interests in the Basin saying similar things even if what you don't have is unanimity or even necessarily a plurality of Governors and their water managers saying those same things.

CJ: If there's a seven-state consensus, endorsed by the Governors' representatives of the seven States, that has typically been viewed as being reflective of the interests of those states. However, Reclamation is looking for ways to continuously improve our ability to receive input — from tribal perspectives, perspectives from NGOs [**n**on-**g**overnmental **o**rganizations], from other voices in the Basin. In a hypothetical, where the seven States bring a consensus agreement but there's some extreme opposition by Tribal nations, then that's a situation Reclamation may be likely to find unacceptable and we'd try to get back to the table to see how we can reshape things into something that will be more generally acceptable. It's not a perfect comparison, but as an example of what this might look like in practice, I would point to what we did in developing the 2007 Interim Guidelines. In the development of the Preferred Alternative, we modified the Basin States' alternative to bring in aspects of the alternative [proposed by a coalition of non-governmental organizations] to make the ultimate action more robust, in particular to increase the storage limits of the [Intentionally Created Surplus (ICS)] mechanism. It's a really good thing we did because we've needed to utilize the additional space in the years since the ROD [Record of Decision] was signed. It was critical to our ability to implement the DCP. I think that illustrates how important it is to incorporate other perspectives and to not dismiss those even when you do have a seven States consensus agreement on your desk.

Tribal Rights

JW: Thinking about the Tribal piece in particular, I know one of the real challenges the Basin faces now is of having to live with a smaller water budget. And the premium, understandably, is being put on wet water conservation. That seems to leave tribes with undeveloped or under-developed water rights out in the cold when it comes to shorter term conservation funding opportunities provided by the BIL and IRA. And then there's the perverse incentives the current system creates, where if Tribes want to benefit from their water rights, by and large they first have to develop those rights for on-reservation use before they can do anything else with them. That puts increased consumptive pressure on the system, which seems to be moving in the opposite direction that we know the Basin as a whole needs to be moving in: living with a water budget that is consistently a lot smaller than the assumptions that were baked into the Colorado River Compact. Does Reclamation envision trying to get at that dynamic through the NEPA process that will bring us a post-2026 management framework?

CJ: We completely understand and acknowledge that this is a real issue. As we tighten things down more and more in terms of water use, the ability of Tribes to develop and benefit from those rights becomes more and more difficult. I think when we talk about equity, there are a lot of different ways you think about equity — sector equity, state equity — this issue with Tribal water rights and the inability to develop as we have a more water scarce system, is an issue of inequity for us to address, and one that tribal voices have been clear in stating should be on the table for the post-2026 process. I can't yet say whether that will be addressed precisely through the NEPA process or as part of a parallel process. But regardless of what lane it's in, it's fundamentally connected to our ability to have an equitable, sustainable set of policies going forward. We want to ensure we're working to respect tribal water rights, and enhance tribal economic sustainability going forward. This is one of the most challenging sets of issues and concerns we're facing in the Colorado River basin. No question.

EIS

Operational Alterations

JW: What does Reclamation see as the key components of doing a successful NEPA process?

CJ: In preparing an EIS, which we anticipate is required for post-2026, the process would start with the issuance of a Notice of Intent to prepare an EIS which starts the public scoping process. Outcomes of the scoping process will inform the definition of items such as the geographic scope and planning horizon. The next major component is to develop a reasonable range of operational alternatives within that scope. Then you analyze and publish the environmental impacts of those operating alternatives through a draft EIS. After addressing public comments received on the draft EIS, a final EIS issued followed by a Record of Decision. We intend to start our scoping [for the post-2026 framework] in early 2023 with the target of publishing a draft EIS, by the end of 2024. So that gives us nearly two years for the scoping, alternative development and resource analysis, to get us to a draft EIS.

JW: It's that scoping process that would be the critical juncture for figuring out what's going to be part of the NEPA process and what needs to move in one or more other parallel processes?

CJ: Yes — definitely not the only juncture but an important one.

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Technical Capability

JW: The seven Basin states indicated in their comment letter that they intend to develop an alternative for inclusion in the NEPA process. Do you have any sense at this point of what the states are thinking in terms of what their alternative might look like?

CJ: I really don't. You can perhaps extract some tidbits from what's in their letter. But rather than anticipating or guessing at a proposed alternative that they may ultimately submit, we at Reclamation have been heavily focused on tool development and thinking about a process where we'd take an integrated set of stakeholders — multi-section, multi-interest, tribes, states, NGOs, other federal agencies — through a series of educational sessions to make them knowledgeable and to help them build the technical, modeling, and analytical capacities to develop those sorts of operational alternatives. The goal would be to improve the ability of a broad range of stakeholders and partners to better assess how their interests could be designed into an analyzed alternative. A by-product of that type of improved capabilities could move the Basin away from the sort of interest-aligned alternatives we've tended to see in the past. Granted, those sorts of alternatives will likely always exist and that's fine. But if we could help basin interests share information and collaborate and potentially come out of this with one multi-stakeholder alternative that had some flavors we could merge into something or create a hybrid, we would be pretty pleased with that outcome. A lot of investment has gone into building the technical capability to be able do that and we're really excited to unveil it, so to speak, in this process.

Modeling Framework

JW: What would you need in one or more proposed alternatives that would be coming from other stakeholders — tribes, NGOs, municipalities, whatever — to be able to include it in the scoping as an alternative in the development process?

CJ: I think that's still undefined. If we look back to 2007, what came out of the scoping were four operation elements: surplus, coordinated operations, lower Basin shortages, and ICS. And then alternatives varied the operations or the policies that fit within those elements. Without having operational elements defined first, it's hard to say what an alternative could look like. But conceptually you'd want the alternative to address these existing elements, and it would also have to be "model-able" in some way since we need to disclose the environmental impacts of it. We have to be able to reflect that policy in a modeling framework. We're more than ready to help any interest group translate a conceptual idea of an alternative into that modeling framework so that isn't a hurdle for people to ensure their approaches are fully considered.

Baseline Issue

JW: I think that would be a really valuable resource. And that begins to get at one of the core technical questions I'm interested in. Namely, from your perspective, what sort of possible hydrologies should Reclamation be using for planning and forecasting purposes? There's no period of record that is likely capable of capturing the range of possible futures we're looking at now with climate change. Are we looking at a baseline of a 12 million acre-feet (MAF) annual average? Eight or nine MAF?

CJ: You have to look at all of them! We want to move away from crafting alternatives around a single assumption about the way the future will play out. We're trying to build a technical framework that incorporates a wide enough range of hydrologic futures and to move away from putting too much of a reliance on the source of the data for the projections — period of record, [global climate model] projections, etc. — and ensures that a wide enough range is provided to allow us to have real discussions about how robust we want to be. You take your policy, and you test it out in the models and see where it failed, how much it failed by, what's the consequence if it fails by that much, and ask how do I make it more robust? That's what will get to those key questions of adaptability and durability.

Adaptability & Durability

Range of Alternatives

JW: How granular a set of scenarios or alternatives does Reclamation think might be able to be encompassed during the NEPA process? For example, is there room to evaluate alternatives that might contemplate restrictions on the kind of crops whose growth might constitute a beneficial use of water?

CJ: Leaving that specific example aside for the moment, I would say that we want the range of alternatives to be extremely wide and robust. We keep reaping the benefits from having had the foresight to have done that in 2007. We will be approaching the post-2026 process with the same mindset. To your specific example, I would say first that the scope is not yet defined so we don't know what any of the operational elements are. But sitting here, we'll have to see what the input is during the scoping process and we'll be carefully reviewing the input received. I would add however, that I would be surprised if they are at that level of detail.

JW: Thanks for the time and thoughts, Carly. Much appreciated.

CJ: You're most welcome and thanks for the opportunity to talk about this critically important topic.

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Settlement

TRIBAL/STATE WATER SETTLEMENT

THE *OKA HOLISSO* & TRIBAL-STATE WATER SETTLEMENT IMPLEMENTATION

by Brian R. Vance (Edmond, OK) & Duane A. Smith (Oklahoma City, OK), Duane Smith & Associates

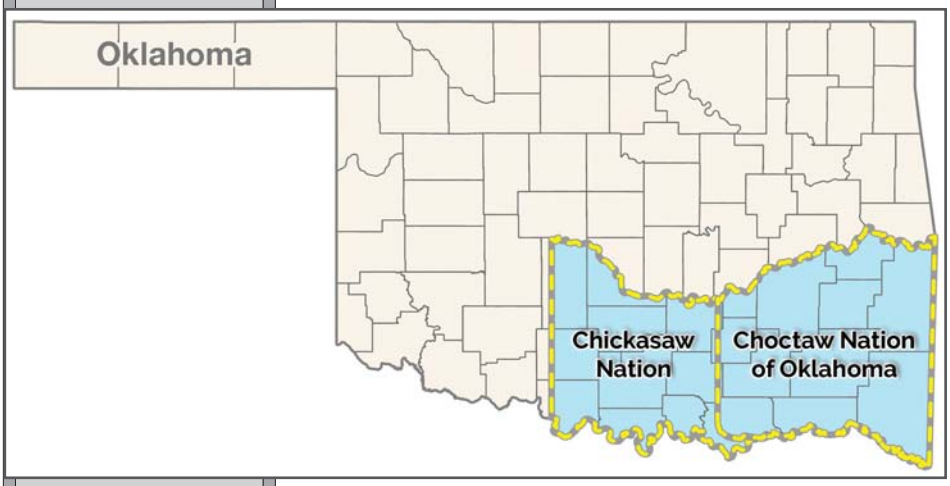
"Book of Water"

Essential Nature

Introduction

This fall, the Chickasaw Nation and Choctaw Nation of Oklahoma will publish the *Oka Holisso*, a comprehensive educational reference and planning tool for implementing the collaborative water management provisions of the 2016 Tribal/State Water Settlement. More than six years in the making, the *Oka Holisso* — meaning "Book of Water" in Tribal language — was motivated by the Nations' enormous pride in and concern for shared water resources in their adjacent Oklahoma territories. This 400-page, first-of-its-kind publication was developed by the Chickasaw–Choctaw Regional Water Planning Team with input from cultural, legal, and public relations staff of both Nations.

The *Oka Holisso* is founded upon the essential nature of water and its stewardship to indigenous Americans. The book's extensive historical and cultural retrospective details the indispensable role water has played throughout Chickasaw and Choctaw history in: communication; trade; agriculture; wildlife management — and in Tribal culture, beliefs, and practices spanning thousands of years. The *Oka Holisso* also addresses the Nations' deep investment in growth and development. This book will guide the Tribes as they continue to work in concert with state, federal, and local partners to secure adequate water supplies for the future, by strengthening water infrastructure and preparing the region for the anticipated impacts of climate change.



Common Heritage

Agriculture

Venerated Water

Stewardship

Background

To the Chickasaw and Choctaw Nations, water has long been an integral element of their collective identity. This holds true for both their aboriginal homelands east of the Mississippi River and in Oklahoma following their forced removal to Indian Territory in the wake of the ratification of the 1830 Treaty of Dancing Rabbit Creek.

According to both oral tradition and archaeological evidence, kinship between the Chickasaws and Choctaws goes back thousands of years. The two Nations share a common migration story, with the Mississippi River serving as a defining geographical and structural point in their histories. Their language and culture are so similar that today the two Nations observe a common heritage and cultural identity, which includes a fundamental connection to the land and its waters.

The early Chickasaws and Choctaws inhabited some of the most fertile lands in all of North America. Later, in present-day Oklahoma, the Nations leveraged available land and water resources to establish sophisticated agricultural systems. Agricultural supported early communities and bolstered their burgeoning economies and trade. Sustainable practices, borne out of reverence for these essential resources, ensured a fruitful bounty each year and for subsequent generations.

Traditional Choctaw and Chickasaw culture has long venerated life-giving rivers and streams — as well as underground water sources — for the abundant game, foods, spices, pottery, leather, and furs they have consistently yielded for 600 generations. River cane, a bamboo-like plant once common in river lowlands, was cultivated as an essential ingredient for the construction of homes, weapons, baskets, fishing equipment, jewelry, musical instruments, furniture, boats, and medicines. Freshwater mussels have been utilized for centuries as a source of food, with their shells used to fashion tools and ornaments.

Culturally, water is a foundation of Tribal belief systems and the centerpiece of countless stories and myths. Flowing rivers and springs were revered sites for meetings and ceremonies. Water has served as a key component in practices surrounding the physical and spiritual cleansing of both body and soul.

It follows that the Tribes have, for millennia, acted as diligent stewards and staunch defenders of water and its countless benefits. Their stewardship has served as the inspiration for the *Oka Holisso* and it continues to inform Tribal decision-making today. As a consequence of this stewardship ethic, the Nations have developed comprehensive policy — founded upon sound science and responsible water management — to protect their resources and the abundant life and robust economies they support.

Settlement

Sovereign Rights

Pursuant to a series of federal-tribal treaties, federal statutes, and Supreme Court decisions that span more than 200 years, the Chickasaw Nation and Choctaw Nation today occupy an area in Oklahoma (formerly Indian Territory) containing a relative abundance of water resources that support diverse communities, cultures, economies, and habitats. As sovereigns with rights and responsibilities relating to their citizenry and territory, the Chickasaw Nation and Choctaw Nation (collectively, Nations) exercise their legal, cultural, and moral position to sustainably manage the treaty homeland's water resources. This position was reinforced, and its future execution detailed, through the historic 2016 Tribal/State Water Settlement Agreement, the implementation of which represents a primary focus of the *Oka Holisso*.

Tribal Waters

The Tribal/State Water Settlement

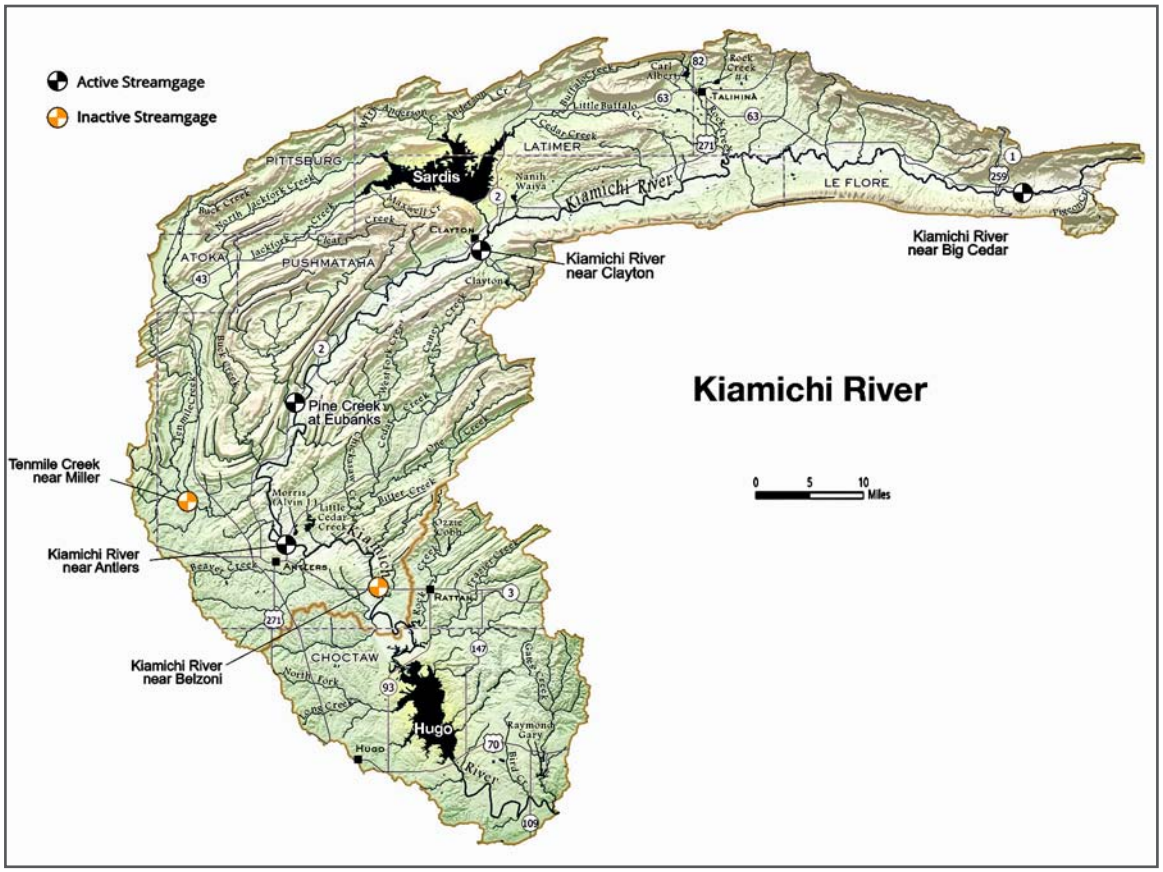
In the 1980s, after the Nations secured federal recognition of their reconstituted governments in Oklahoma, Chickasaw and Choctaw representatives asserted general rights to their treaty homelands' waters. The two subsequent decades saw failed efforts to secure tribal/state agreements that were premised on proposals to market specific water resources. However, the negotiations did underscore and advance the centrality of Tribal water interests in the treaty territories.

Sustainability

Throughout this period, Chickasaw and Choctaw leaders defined and refined their firm commitment to long-term sustainability as an overarching principle of resource management. As the Nations cooperated to ensure adequate supplies of clean water throughout the territories and restore riparian habitats for key plant and animal species, further progress to ensure the legal recognition and protection of their rights yielded fruitful partnerships with non-tribal partners.

Proposed Transfers

In 2009, the simmering Tribal/State water conflict erupted over the State of Oklahoma's proposed plan to make more than 100,000 **a**cre-**f**eet per **y**ear (AFY) of Kiamichi River water available for the City of Oklahoma City's future growth. The controversial proposal also called for the State to transfer its decades-old rights to the water storage capacity in Sardis Lake, a US Army Corps of Engineers (Army Corps) reservoir located on a tributary of the Kiamichi, to Oklahoma City (City). Through this exchange, the City would assume the State's substantial debt owed to the federal government for construction of the lake in 1982.



Settlement

Treaty Rights

After initial Tribal/State negotiations failed to address vital issues and concerns, the Chickasaw and Choctaw Nations filed suit in federal court challenging the City's pending water right permit application, as well as the State-City water storage transfer agreement. Relying on removal-era treaties and the original homeland-for-homeland exchange negotiated with the United States, the Tribes asserted treaty-protected rights to waters sufficient to support a permanent and sustainable homeland. They further alleged that the treaty rights preempted Oklahoma from proceeding with its plan, which they argued would be inconsistent with the long-term health and welfare of the Nations' homelands. After two years of complex litigation and much controversy, the Nations, the State, and the City began meaningful negotiations to discover mutually acceptable resolutions. [For additional information regarding the Nations lawsuit and subsequent settlement, *see* Moon, *TWR* #79 and #159; *TWR* Water Briefs #95, #97 and #151; and Greetham, *TWR* #82].

Objectives

It was during this period that the Nations began formal planning to guide the use, protection, and management of water resources. This effort was framed through Tribal leaders' articulation of seven water-centric objectives that were deemed "essential" — with: (1) Unity and (2) Sustainability serving as the foundation for (3) Urban Needs, (4) Town and Rural Needs, (5) Tourism, (6) Agriculture and (7) Drought Defense. This foundational vision soon evolved into distinct policy goals and a complex framework that today directs the Nations' joint water planning programs. Sustainability is central to the Nations as they endeavor to achieve a balance between water supplies required for homes and businesses with water indispensable for environmental, cultural, and often overlooked recreational purposes — recreation is the third most profitable industry in the Nations' territories.

Parties' Positions

In pursuit of successful multi-party negotiations to resolve the complex water conflict, the Nations emphasized both sustainability and sovereignty. They argued for a voice in the administration of major state water rights actions as well as meaningful protections for the treaty territories' consumptive and non-consumptive water use needs. The State rigidly defended the existing regulatory structures and the predictability in administration those structures afforded. The City stressed its goal of obtaining access to additional water for its citizens. The United States — acting both as fiduciary for Tribal interests as well as a sovereign with its own governing and proprietary rights and interests — monitored the parties' progress throughout discussions while underscoring various national policy priorities.

Settlement

In August 2016, the parties announced they had reached a settlement. Four months later, the President of the United States signed legislation ratifying the terms and directing the Secretary of the Department of the Interior to sign the Agreement on the federal government's behalf. Since then, the settlement parties have worked diligently to satisfy preconditions necessary to enforce the Agreement, working together to finalize and implement the broad Settlement Agreement.

Elements

In broad terms, finalized tribal/state water settlements typically include the following three elements:

1) a full and final waiver of tribal claims, which is typically a federal prerequisite
2) quantification of tribal rights to use water
3) rules for the administration of water rights and for addressing intergovernmental conflicts

Furthermore, water settlements frequently make federal funds available to tribes and other settlement parties for financial and material support, as needed. Each settlement is unique, but they generally include these elements, or variations of them.

Water Use Proposals

The Chickasaw and Choctaw Nations' Settlement uniquely focuses on scientific assessment of water use proposals at the regulatory stage, i.e., before property rights legally attach. This emphasis on regulatory standards and procedures, as opposed to property rights, addresses all three standard water settlement elements. For example, in lieu of authorizing a new water development project, this Settlement establishes new allocations and limits on an existing federal project, i.e., Sardis Lake.

Water Allocation

The Congressionally-approved allocation of Sardis water storage emphasizes the use of Sardis Lake by and for the benefit of local water uses through:

1. Permanently dedicating almost half of Sardis Lake water storage to maintain and bolster fish, wildlife, and related recreational purposes and needs; and
2. Allocating 13 percent of Sardis storage capacity for water providers and users in the surrounding 10-county area of southeastern Oklahoma. Furthermore, this "set-aside" storage will be made available on favorable terms.

Highlights

Some specific highlights of the executed Settlement Agreement include:

- It sets forth the Chickasaw and Choctaw Nations' waivers of claims (including certain exceptions) and provides for waivers of Federal, Tribal, and State sovereign immunity for purposes of enforcing the terms of the Settlement.
- It establishes terms for future Oklahoma Water Resource Board (OWRB) rulemaking and permitting decisions, providing critical mechanisms relating to: Tribal/State engagement on development

Settlement

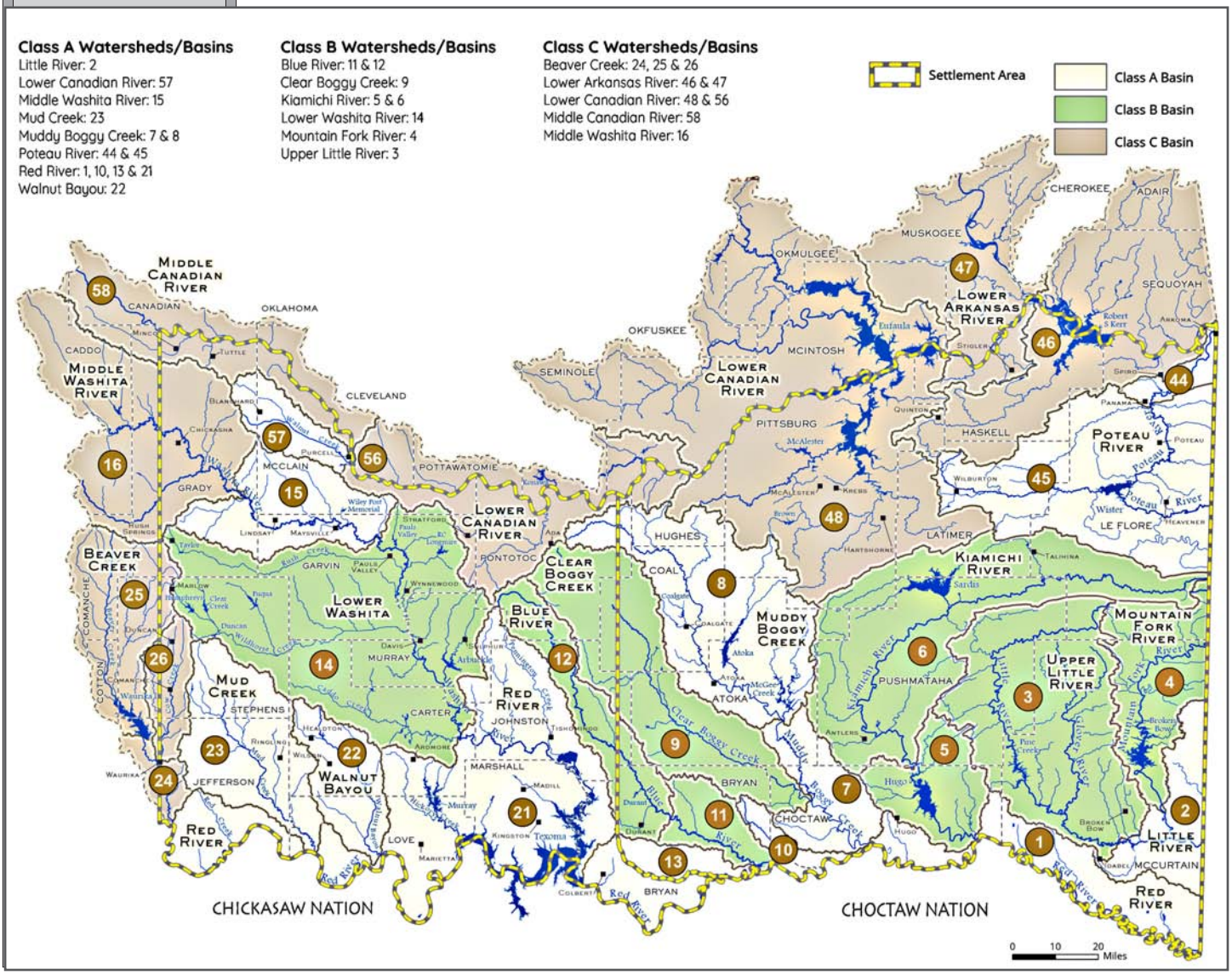
Terms & Conditions

Water Planning

of hydrologic models; State conformance with uniform pre-permitting regulatory inquiries; and administration of the groundwater of the particularly sensitive Arbuckle-Simpson aquifer.

- It establishes terms and conditions to resolve the Nations' jurisdictional objections to the OWRB's decision to grant a permit to Oklahoma City for the purpose of diverting and using waters of the Kiamichi Basin, including mechanisms to protect Sardis Reservoir lake levels, diversion point bypass flows, and allocations of waters stored in the lake. It also establishes a fund for important mitigation and conservation projects.
- It recognizes, identifies, and protects existing Tribal water use rights and establishes rules for development of future Tribal rights, including guidance for management of intergovernmental interests in competing water uses. It provides similar protections for the water rights of Tribal allottees and potential opportunities for them to litigate for additional rights.
- It declares Tribal/State common interest in long-term water sustainability and importantly supports intergovernmental communication and active collaboration on water planning.

To functionally implement the water planning, rights, permitting and use aspects of the Settlement, it delineates and defines three classes of Settlement Area Hydrologic Basins consistent with US Geological Survey (USGS) 12-digit hydrologic unit code (HUC) boundaries. These 30 distinct watersheds also form the analytical foundation of the *Oka Holisso*.



Settlement

"Mean Available Flow"

Rather than utilizing the State of Oklahoma's methodology to assess the potential impact of proposed water use permits, during Settlement negotiations the Nations advocated for an alternate, more protective, mechanism. As a result, the final Agreement introduced the concept of "Mean Available Flow" to serve as an essential determinant of surface water available for new permits within each basin. Frequently updated calculations of each basin's Mean Available Flow — relative to the location of a proposed diversion point — also incorporate protections for local water quality and ecological, recreational and related non-consumptive needs.

Defined

More specifically, according to terms of the Settlement, Mean Available Flow at a proposed point of diversion is the amount of water remaining after subtracting flows required to satisfy:

- permitted appropriative uses
- any surface water right developed by either Nation related to future surface water development;
- domestic use set-aside (i.e., six acre-feet/year per 160 acres within the basin)
- prior vested rights
- surface water rights of Tribal allottees
- pending applications
- reservoir yields
- other designated purposes in basin, including apportionment provisions of applicable interstate stream compacts

"Conferral Threshold"

Mean Available Flow in a basin is a key determinant of the "conferral threshold" — i.e., the estimated minimum permit application amount that triggers the Settlement Agreement's conferral process. This unique consideration of out-of-basin or out-of-Settlement Area water use proposals compels joint Tribal/State technical review and hydrologic modeling of the proposed application and its potential impacts.

Protection Levels

Conferral threshold elements vary for each basin class (A, B or C) with Class A basins receiving the highest level of protection. Each unique class threshold number is determined by either the percentage of Mean Available Flow, which is calculated from numerous factors explained in detail in the Tribal/State Water Settlement Agreement, and/or a set permit amount in **a**cre-**f**eet per **y**ear (AFY) — whichever is smaller. For example, as detailed in Section 5.3.1.1.2.1 of the Settlement Agreement, conferral in a Class A Basin is triggered when an application for use outside of the Settlement Area is in an amount that is five percent or more of the Mean Available Flow at the diversion point; that amount increases to 10 percent in a Class C Basin.

Water Availability

This new and innovative mechanism to ensure the availability of water for both consumptive and non-consumptive needs directly reflects the Nations' foundational sustainability ethic. It also provides the Nations with an equal "seat at the table" when it comes to major permitting decisions. Rarely have tribal/state water rights settlements included such means for tribal nations to directly influence state permitting processes.

New Governing Structure

Effective utilization of this new intergovernmental structure, and the accompanying pursuit of common sustainability policies between the parties, is impossible without good data. The Nations are committed to letting science, rather than emotion or preconceived notions, drive decisions related to water management and protection. Therefore, they prioritize the use of cutting-edge tools and other measures to ensure quality data collection and analysis. The *Oka Holisso*, as well as its future updates, is envisioned as an accessible and reliable repository for such information.

Overview of the *Oka Holisso*

Multi-Value Benefits

The *Oka Holisso* is rooted in the Nations' sovereignty and their stated desire to ensure that plentiful quantities of good quality water remain available for all uses and users in the treaty territories. The *Oka Holisso* illustrates how sound management of the Nations' waters provides multi-value benefits surrounding economic development, ecological health, and the preservation of cultural heritage. The book's extensive data on the territories' rivers and streams, major lakes, and aquifers — along with detailed information on water use and availability (including hundreds of water provider systems) — makes it a valuable educational and reference document for both planners and members of the public who increasingly desire a voice in water-related decision-making.

Reference Document

Oka Holisso features include information on sites and areas of significant cultural and historical importance as well as facilities (parks, refuges, wildlife/wilderness areas, etc.) that provide infinite and varied recreational opportunities. Recreation is the region's third-largest industry and a staple of local economies.

Importantly, the *Oka Holisso* advances Tribal water policy. This is further established in the Settlement Agreement and related concepts of fundamental importance to the Nations' people and economies.

Settlement

Planning Efforts

As a planning document, the *Oka Holisso* serves to focus Tribal water planning efforts. The Settlement Agreement sets forth enforceable and agreed-upon terms. The *Oka Holisso*, on the other hand, marshals facts and informs common understanding of the treaty territories' water resources and optimum measures to both manage and protect their myriad benefits. The publication's exhaustive water data and related information assists in identifying areas of emerging need. This includes communities with potential water reliability concerns — determined by the quantity and quality of supplies as well as related infrastructure — or stream systems requiring restoration or additional protection.

The *Oka Holisso* summarizes dozens of cooperative water projects currently underway within the Nations. Such projects and initiatives, often conducted in cooperation with federal water agencies, aim to augment local water supplies, improve water and wastewater infrastructure, mitigate water quality problems, restore watersheds, strengthen data collection, and adapt to climate change. Through the Nations' cooperative tribal water planning program, the tribes also conduct hydrologic research and studies, and they support the long-term activities of various local/regional water planning organizations.

Implementation

Basin Summaries

Perhaps above all, the *Oka Holisso* serves as a first-level exploratory tool for Settlement implementation, particularly in relation to major water permitting proposals. In this regard, the most prominent component of the *Oka Holisso* is the Basin Summaries.

Watershed Uniformity

By providing a general determination of both local and regional water supply reliability, the Basin Summaries present water data and other unique characteristics specific to each of the 30 delineated Settlement hydrologic basins through various maps, tables, charts, and related products. In some cases, these Class A, B and C basins, which align with US Geological Survey (USGS) 12-digit Hydrologic Unit Code (HUC) planning basins, have been grouped into a single Basin Summary to better illustrate watershed uniformity. These hydrologic units were delineated to include a long-term USGS streamflow gage at or near the basin outlet. They are identical to those utilized for the Oklahoma Comprehensive Water Plan (OCWP) —i.e., the State's regularly updated water planning strategy.

Each of the 19 Basin Summaries (sometimes including two or more basins grouped into a common watershed) includes the following sub-sections and relevant data:

Water and Related Resources

Data for principal rivers and streams (generally more than ten miles in length) are supplied by the OWRB and USGS, principally the National Hydrography Dataset (NHD). Reflecting the general nature of Oklahoma's typically low-gradient, meandering streams, the average slope (determined via National Elevation Dataset 30-meter resolution data) is provided for each basin/watershed; the rise and run is averaged across the entire basin/watershed.

Water Variability

The territories' all-important water variability is demonstrated through charts displaying annual and monthly streamflow data estimated at a hypothetical bottom-of-basin gage.

Base Flows

Estimated baseflows, an important characteristic of a basin/watershed's general annual "water productivity," were calculated using:

1) period-of-record data from the furthest downstream gage in each basin
2) basin drainage area from OCWP basin Geographic Information System (GIS) shapefiles
3) HUC 12 values
4) data from the USGS StreamStats web application
5) results obtained from Purdue University's Web-based Hydrograph Analysis Tool (WHAT)

Streamflow Availability

The resulting charts often demonstrate that streamflow, which is appropriated on an annual basis in Oklahoma, is frequently unavailable to users at a particular time and location due to seasonal and climatic variables. Watershed/basin maps include the locations of USGS streamgages. Inactive gages are also included as their data remains of value and these stations may be reactivated in the future.

Streamflow exceedance estimates, including those for hypothetical stream gage at a basin/watershed's outlet, depict the probability of specific flow occurring at a given time and gage location. Of course, flows fluctuate according to many variables.

Flow Variables

Flows fluctuation variables include:

- the amount of upstream drainage area
- precipitation and related weather/climate issues
- upstream water use
- land uses in the watershed
- soil characteristics
- the presence of upstream reservoirs
- groundwater and spring contributions
- other related factors

Settlement

In some watersheds with multiple Settlement Area basins and major reservoir operations having a significant impact on streamflows, upstream/alternative streamgage sites were utilized to more accurately estimate primary streamflow exceedance in the watershed.

Reservoirs & Lakes

"Principal" federal, state, and municipal reservoirs and lakes are defined in the *Oka Holisso* as named waterbodies with a surface area of 40 acres or more. Information on principal reservoirs in each basin/watershed is presented, obtained from the Army Corps and OWRB via the 2012 OCWP, Oklahoma Dam Inventory, water rights database, and other sources. Named lakes of at least 20 acres in size are noted as well, as many of them could potentially provide useful water supplies to local users. Specific purposes assigned to lakes — Water Supply, Recreation, Hydroelectric Power, Irrigation, Water Quality, Fish and Wildlife, Flood Control, Low Flow Regulation, Navigation, Conservation and Cooling Water — are also included in accompanying tables. These are the original uses authorized by the funding entity or dam owner for the reservoir's water storage. All Natural Resources Conservation Service (formerly Soil Conservation Service) sites include, at a minimum, flood control. Local conservation districts are frequently the responsible authorities for these sites.

Exceedance Charts

Reservoir level exceedance charts have been developed for the major federal and state lakes in the Settlement Area. Of particular utility from a water supply standpoint is the percentage of time that each reservoir's supply is at or near the normal pool (i.e., conservation storage) elevation. Some reservoirs are subject to seasonal pool operation plans where the target elevation is adjusted for a period of time to accommodate a particular project objective(s) — such as flood control during the rainy season or severe flood, or to promote the growth of beneficial fish and wildlife habitat along the shore.

Data Use

Land Use

Land use data in the Basin Summaries was extracted and downscaled from the National Land Cover Database (NLCD) created through the Multi-Resolution Land Characteristics (MRLC) Consortium. The Consortium consists of federal agencies who coordinate and generate consistent land cover information on a national scale for a wide variety of environmental, land management, and modeling applications. This data is particularly useful in: assessing ecosystem status and health; modeling nutrient and pesticide runoff; understanding spatial patterns of biodiversity; land use planning; deriving landscape pattern metrics; and in developing land management policies. The NLCD is derived from decadal Landsat satellite imagery and other supplementary datasets.

Species' Habitats

Endangered and Threatened Species

The preservation of plant and animal species inhabiting treaty lands aligns well with the environmental sustainability ethic of the Nations. Of special concern are officially-recognized endangered and threatened species identified through guidelines established in the federal Endangered Species Act (ESA). Occurrences of these species, which are delineated by the US Fish and Wildlife Service (USFWS), are noted throughout the basin summaries.

Eleven federally endangered and six threatened species currently inhabit the 30 Settlement Area basins. The USFWS collaborates with tribes, states, private landowners, non-governmental organizations, and federal partners to conserve at-risk species and their habitats. The Nations remain committed to the protection and recovery (when possible) of imperiled species.

Beneficial Uses

Water Quality

Included in discussions of surface waters are depictions of water quality, which is heavily influenced by the characteristics of associated ecoregions. Information is presented on goals for designated beneficial uses (i.e., Emergency Water Supply, Public and Private Water Supply, Fish and Wildlife Propagation, Agriculture, Recreation, Navigation, and Aesthetics) associated with water quality attainment and impairments. This information includes the trophic status of major/principal lakes and reservoirs. Trophic status is essentially a measure of a lake's biological productivity, which is determined by the basin's climate and assorted lake/watershed properties (i.e., land use, soils, geology, and vegetation). Generally, too much productivity can have a negative impact on overall water quality and thus limit potential attainment of assigned beneficial uses.

Impairment Causes

Basin summaries also attribute suspected causes of water quality impairments, which Total Maximum Daily Load (TMDL) and related studies, and subsequent mitigation actions seek to remedy. These include low dissolved oxygen, turbidity, oil and grease, E. coli and Enterococci (i.e., bacteria), and total phosphorus.

Settlement

"Maximum Annual Yield"

Hydrologic Connection

Instream Flows

Streamflow Estimates

Systems' Inventory

Sustainability Commitment

Groundwater

Basin Summaries also present information on major and minor bedrock and alluvium/terrace aquifers underlying the confines of each basin/watershed. Aquifer boundaries (i.e., the extent of outcrop areas) are determined. Related data — including each aquifer's all-important **m**aximum **a**nnual **y**ield ("MAY" - the total amount of fresh groundwater that can be withdrawn while allowing a minimum 20-year life of the basin) and **e**qual **p**roportionate **s**hare ("EPS"- the relevant share of water allocated per acre to users) — was provided by the OWRB. In Oklahoma, unstudied aquifers are assigned a default temporary EPS of 2.0 acre-feet per acre of land until a detailed hydrologic investigation is completed and the OWRB sets a final MAY and EPS. The Nations continue to advocate for a more sustainable state system to manage groundwater, as well as surface water, which sufficiently recognizes the inherent hydrologic connection between the two resources.

The existing number of permitted and domestic wells is provided to assist in determinations of current water use and each basin/watershed's associated groundwater supply potential. This information was obtained from the OWRB's water well database, which was filtered to exclude wells used exclusively for observation/monitoring, water quality, or related "non-use" purposes. Domestic wells, which typically provide relatively small amounts of water for general household and related purposes around the home, do not require a permit and are especially common in rural areas lacking access to a water provider. Many wells in Oklahoma draw water from less reliable, undelineated sources.

Permitted Water Use

OWRB water use permit information (initially collected in September 2019) utilized for associated maps and data tables, includes the locations of streamflow diversions as well as water wells associated with various permitted users and uses. Multiple diversions or wells are often associated with a single surface or groundwater permit. Some permits are assigned more than one beneficial use. In such cases, specific allowable withdrawal or diversion amounts are attributed to each use. The Recreation, Fish and Wildlife use is not directly associated with requirements to maintain or preserve instream (or environmental) flows intended to benefit plant and/or animal species and associated environmental needs. Again, permitted water in Oklahoma is primarily associated with consumptive uses and does not fully address needs associated with recreation, the environment, fish and wildlife habitat, and related resources.

Streamflow estimates in the *Oka Holisso*, which are derived from historical data, not only provide a baseline of each basin's water supply potential. As mentioned, they also help determine when individual water use permit applications trigger the Settlement Agreement's conferral process.

Water Supply Systems

Each summary also features an inventory of each basin's associated public water supply systems. This includes the most recent data from the Oklahoma Department of Environmental Quality's Safe Drinking Water Information System (SDWIS) and other sources concerning each provider's: approximate number of residential customers served; source(s) of supply; water sales and purchases; and essential infrastructure facilities (both active and inactive). Such facilities include: intake structures to divert water from a reservoir; pump facilities to move and distribute water; water storage, such as standpipes and towers; water treatment plants (not including on-site treatment facilities, such as a chlorination station at a water well); and specific sources of groundwater, such as wells or springs. System boundaries were obtained from the OWRB. Service areas are mostly unofficial and, for many municipalities, often identical to the municipal boundaries. This information is useful to rural households desiring access to water provider service as well as to planners assessing potentially beneficial interconnections between systems and even the sharing of infrastructure. There are currently approximately 196 providers located in the Settlement Area.

Conclusion

In addition to the comprehensive data, and historical and cultural information presented in the *Oka Holisso*, the publication contains dozens of stunning photographs of tribal lands and waters. But while the book is the first to highlight, in detail, both the diversity and utility of water and related natural resources throughout the Nations' Oklahoma homelands, even casual readers are urged not to overlook the bigger picture. The *Oka Holisso* represents an important exercise in collective Tribal sovereignty as well as the Nations' legal, cultural, and moral position to sustainably manage the treaty homeland's water resources. The book further strengthens the new Tribal/State commitment to the long-term sustainability of shared waters, which in turn ensures the long-term quality of life for current and future residents of south central and southeast Oklahoma.

Settlement

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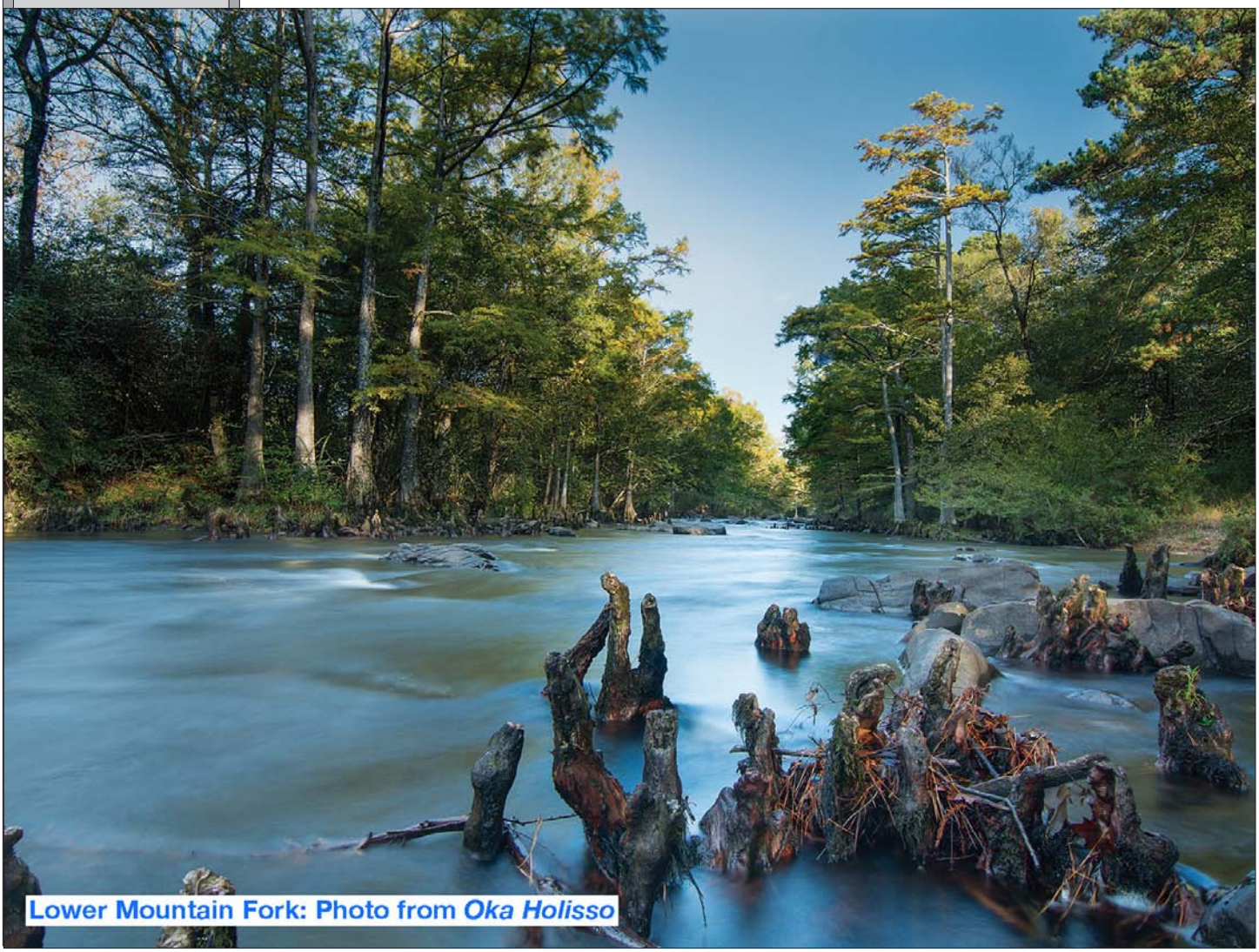
The *Oka Holisso* is available for purchase at:
https://chickasawpress.com/Books/Oka-Holisso-Chickasaw-and-Choctaw-Water-Resource.aspx

Duane Smith is considered one of Oklahoma's foremost authorities on water. Duane specializes in regional and tribal water planning. As Executive Director of the Oklahoma Water Resources Board for 13 years, he garnered unique experience in the administration of Oklahoma water law and implementation of state and federal water programs. Upon his retirement from the state in 2010, he served a year in Afghanistan assisting the US Army Corps of Engineers in establishing much-needed water service for the country's citizens. As a consultant — highlighted by his ongoing work with the Chickasaw Nation and Choctaw Nation of Oklahoma — Mr. Smith works to empower the decision-making authority of water use stakeholders in ensuring the attainment of local, regional, and Tribal economic development goals. He currently serves as Executive Director of the Oka' Institute at East Central Oklahoma University where he promotes water sustainability research and initiatives.

Brian Vance, Duane Smith & Associates, has a B.A. in Journalism and worked 29 years for the Oklahoma Water Resources Board as both a water planner and the agency's Communications Director. During his career, he wrote, edited, developed and organized several high-profile technical and promotional publications — including the Oklahoma Water Atlas, Lakes of Oklahoma and the 2012 Update of the Oklahoma Comprehensive Water Plan — as well as countless press releases, reports, water policy summaries, presentations and related materials. Since his retirement from the OWRB in 2014, Mr. Vance has consulted on and co-authored numerous regional water plans in Oklahoma. He currently assists the Chickasaw Nation and Choctaw Nation of Oklahoma in development and implementation of Tribal water planning initiatives and programs.



Lower Mountain Fork: Photo from *Oka Holisso*

Fish Habitat

Non-Regulatory Mechanisms

Habitat Conservation

Leveraged Funding

Habitat Assessments

Priorities

Projects Lists

NATIONAL FISH HABITAT PARTNERSHIP

PROTECTING, RESTORING, & ENHANCING US FISH HABITATS

by Ryan Roberts, Association of Fish and Wildlife Agencies (Washington, DC),
Gary Whelan, Michigan Dept. of Natural Resources (Lansing, MI),
& Christopher Estes, Chalk Board Enterprises, LLC (Anchorage, AK)

Introduction

This is Part 1 of a 2 Part series providing an introductory overview of the National Fish Habitat Partnership (NFHP — *see* www.fishhabitat.org). The NFHP was initially established in 2006 to implement the National Fish Habitat Action Plan (NFHAP) for the purposes of using non-regulatory mechanisms by **f**ish **h**abitat **p**artnerships (FHPs) to protect, restore, and enhance our nation's fish habitats. The NFHAP was codified into law in 2020 as Title II of America's Conservation Enhancement Act (ACE Act) (PL 116-188). Although this is the 16th year of its existence, the 2020 enabling legislation established dedicated core funding and made several modifications to the original version of the NFHP that operated under the NFHAP, such as Board membership and reporting requirements.

Mission & Scope

The NFHP mission was established by the original NFHAP and retained by the subsequent enabling legislation. The Mission "is to protect, restore, and enhance the nation's fish and aquatic communities through partnerships that foster fish habitat conservation through FHPs and improve the quality of life for the American people." Since the NFHP's establishment in 2006, its network of 20 FHPs have been supported by the NFHP Board. To date, the collective efforts of the Board and FHPs have resulted in completion of 1,299 science-based habitat conservation projects spanning all 50 states. Seventy projects were implemented in Fiscal Year (FY) 2021 (October 2020 to September 2021). While the NFHP has directly contributed $50.6 million in project funding since 2006, each of those federal dollars has been leveraged by over a 4-to-1 ratio — which reflects the significant ability of NFHP influences and values to maximize the impacts of our investments on-the-ground. The NFHP has also worked across a broad range of federal, state, university, tribal, local governmental entities, including non-governmental organizations, and industrial and private partners to develop two national fish habitat assessments. Those assessments identified intact systems that need conservation protection actions and assessed the root causes of aquatic habitat degradation in altered systems to guide future fish habitat conservation efforts.

Similar to the structure established by the original NFHAP, the post-legislation based NFHP continues to be comprised of a Board, its staff, and FHPs that have been modified based on adjustments required by the law. Each FHP continues to represent a broad range of federal state, tribal, and local agency partners, including non-governmental organizations, industry, and the private sector (*see* listing below).

HOW WILL WE ACHIEVE OUR MISSION?

- Supporting existing fish habitat partnerships and fostering new efforts
- Mobilizing and focusing national and local support for achieving fish habitat conservation goals
- Setting national and regional fish habitat conservation goals
- Measuring and communicating the status and needs of fish habitats
- Providing national leadership and coordination to conserve fish habitats

See: www.fishhabitat.org ("About")

2020 Enabling Legislation and Board Achievements

Since passage of the 2020 enabling legislation, the NFHP Partnership has also been working to implement other changes to its infrastructure outlined within the ACE Act. The Board is currently working on setting priorities and establishing working groups of the Board to tackle other elements outlined in the legislation. Examples of collaborative achievements of the newly appointed Board and the FHPs include development of new project selection criteria and prompt execution of the new project submission process and Board review outlined in the ACE Act. Collectively these achievements resulted in the Board's submission of FY 2022 and 2023 project lists for the Secretary of Interior's review by July 1, 2022, which were subsequently approved. The first progress report was also completed and submitted to Congress in accordance with the law.

Fish Habitat

Interagency Operations Plan

Another requirement of the law, outlined in Section 208 of Title II, required development of a federal Interagency Operation Plan (IOP) by the Federal members of the Board, led by the US Fish and Wildlife Service. The IOP is intended to establish a system for all federal agencies with aquatic habitat related programs (not just those represented on the Board) to more cost effectively coordinate efforts in support of the NFHP implementation. A draft of the IOP was completed at the end of 2020 and is undergoing Board and other federal participants reviews and adjustments.

The Board also re-established several Committees that operated prior to when the federal enabling legislation was enacted. These Committees support the Board's work on specific tasks including: scientific and technical habitat assessments; Fish Habitat Conservation project review; policy analysis; and communications. (Board, *see* References below)

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2025 Assessment

Fish Habitat Partnerships

As initially envisioned in 2006, the NFHP continues to improve the status of our nation's fisheries resources and aquatic habitats by leveraging funds and collaborating with a diverse network of partners to achieve shared goals. In FY 2022, we look forward to enhancing the operations of the Fish Habitat Partnerships and Board and to begin other steps for Congress to formally approve the various Fish Habitat Partnerships. We will also continue planning efforts to complete a new national fish habitat science-based assessment by 2025.

The 20 FHPs under NFHP that implement the National Fish Habitat Action Plan are briefly described below. These partnerships are focused either on species, geographic regions/landscapes, or systems (i.e., Reservoirs).

Estuarine Focus

Atlantic Coastal Fish Habitat Partnership (Board recognized March, 2009)

The geographic extent of the Atlantic Coastal Fish Habitat Partnership (ACFHP) stretches from Maine to the Florida Keys, including all or part of 16 States. It covers 476,357 square miles, including land areas inland to the headwaters of coastal rivers, and ocean areas outward to the continental slope. The ACFHP plans to work throughout the region, but will focus on estuarine environments and place less emphasis on coastal headwaters and offshore marine ecosystems.
See: www.atlanticfishhabitat.org/

Fish Passage

California Fish Passage Forum (Board recognized March, 2010)

The mission of the California Fish Passage Forum is to protect and restore listed anadromous salmonid species, and other aquatic organisms, in California by promoting collaboration among public and private sectors for fish passage improvement projects and programs. Species of concern include (but are not limited to): coho and chinook salmon, steelhead trout, and Pacific lamprey.
See: www.cafishpassageforum.org

Management Actions

Desert Fish Habitat Partnership (Board recognized March, 2009)

Desert fish have declined across these arid lands as a result of habitat loss and alteration and the widespread introduction and establishment of nonnative aquatic species. Despite numerous federal and state laws, regulations, and policies to protect and recover native desert fishes and their habitats, most of them remain imperiled. Current habitat conditions and threats require specific management actions and focused consideration of desert fishes if these species and their habitats are to be protected and remain viable into the future.
See: www.desertfhp.org/

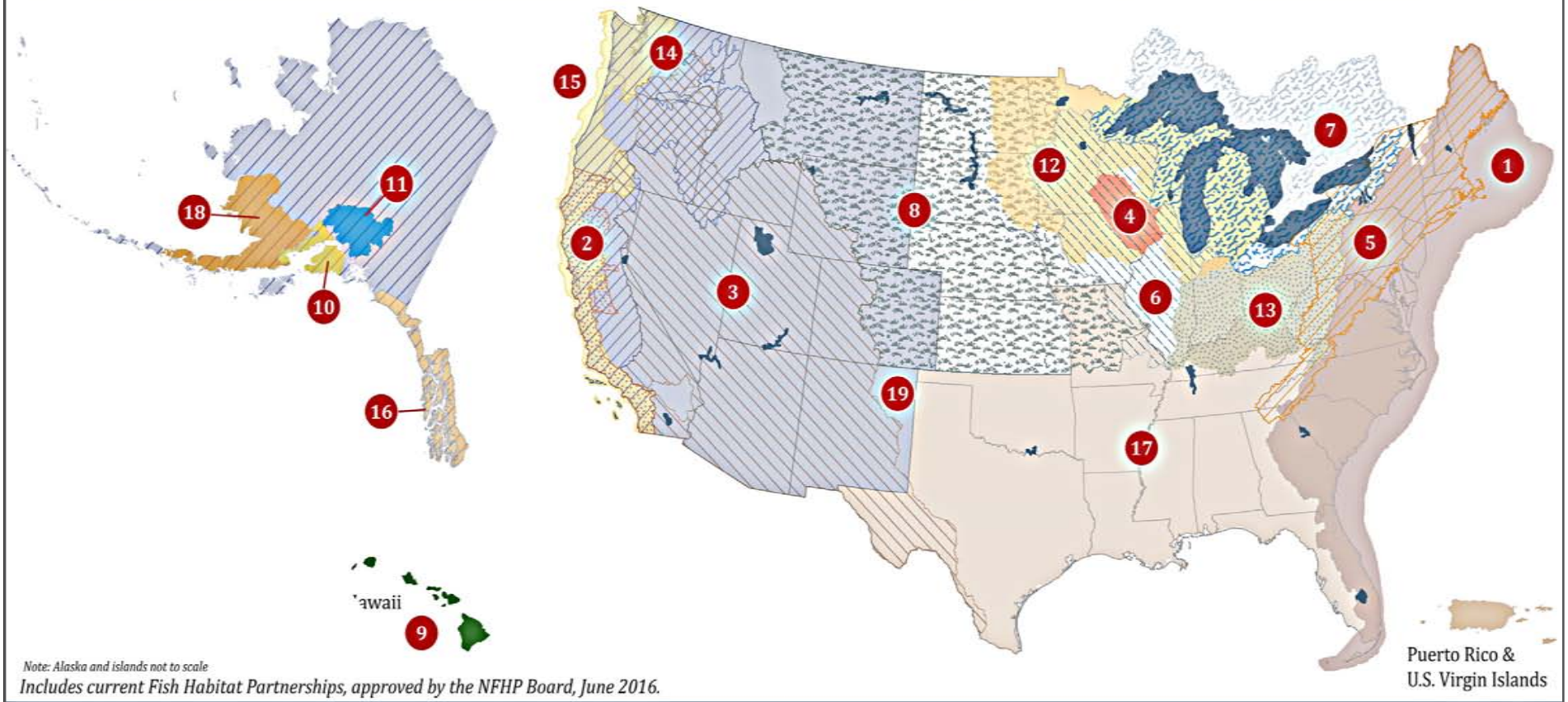
Regional Strategy

Driftless Area Restoration Effort (Board recognized October, 2007)

The Driftless Area is a 24,000 square-mile area that encompasses portions of southeast Minnesota, northeast Iowa, southwest Wisconsin and northwest Illinois bypassed by the last continental glacier. The region has a high concentration of spring-fed coldwater streams and is recognized for its high diversity of plants, animals, and habitats. The Driftless Area Restoration Effort (DARE) partnership formed to address habitat degradation, loss, and alteration that are the primary factors contributing to the decline of fish populations in this unique region. Poor land and water management practices including intensive row crops, fertilizer use, channelization, water withdrawals, loss of perennial vegetation, and invasive species have caused excessive streambank erosion, sedimentation, and poor water quality that impact waters all the way to the Gulf of Mexico, where such practices have helped contribute to hypoxic waters. DARE is employing a collaborative approach to plan and implement cost effective projects to improve aquatic habitat for fish and other aquatic species by developing a regional strategy that links upland health and fish habitat with fish populations in targeted watersheds.
See: https://wicouncil.tu.org/tu-projects/driftless-area-restoration-effort

Regional Fish Habitat Partnerships

NATIONAL FISH HABITAT PARTNERSHIP



Note: Alaska and islands not to scale

Includes current Fish Habitat Partnerships, approved by the NFHP Board, June 2016.

Geographic / Species Based Partnerships

1. Atlantic Coast FHP
2. California Fish Passage Forum
3. Desert FHP
4. Driftless Area Restoration Network
5. Eastern Brook Trout Joint Venture
6. Fishers and Farmers Partnership
7. Great Lakes Basin FHP
8. Great Plains FHP
9. Hawaii FHP
10. Kenai Peninsula FHP
11. Matanuska-Susitna Basin Salmon Habitat Partnership
12. Midwest Glacial Lakes Partnership
13. Ohio River Basin FHP
14. Pacific Lamprey FHP
15. Pacific Marine and Estuarine FHP
16. Southeast Alaska FHP
17. Southeast Aquatic Resources FHP
18. Southwest Alaska Salmon Habitat Partnership
19. Western Native Trout Initiative

System Based Partnership

20. Reservoir FHP*

**the Reservoir FHP is a system based partnership that covers reservoirs across the country*

Fish Habitat

Fishable Populations

Eastern Brook Trout Joint Venture (Board recognized October, 2007)

In 2005, in recognition of the need to address regional and range-wide threats to brook trout, a group of public and private entities formed the Eastern Brook Trout Joint Venture (EBTJV) to halt the decline of brook trout and restore fishable populations of this iconic species. The EBTJV directs locally-driven efforts that build partnerships to improve fish habitat, working to ensure healthy, fishable brook trout populations throughout their historic eastern United States range. The EBTJV's long-term goals are to develop a comprehensive restoration and education strategy to improve aquatic habitats; build awareness through education; and raise federal, state, and local funds for brook trout conservation that will ultimately help enhance public use of brook trout and generally improve ecosystems and water quality within the watersheds they inhabit.
See: http://easternbrooktrout.org

Landowners' Conservation

Fishers & Farmers Partnership (Board recognized March, 2010)

The Fishers & Farmers Partnership vision rests on a belief that the combined experience, knowledge and skills of fishers and farmers can measurably improve the health of land and streams in the altered landscape of the Upper Mississippi River Basin. To advance this purpose, rural landowners voluntarily develop and implement science-based solutions to local water quality issues, with the support of conservationists. As landowners achieve their own goals for conservation and sustainable prosperity, successful practices will be demonstrated and effects measured, lessons will be learned and shared throughout the basin, and ultimately a globally significant landscape will be renewed.
See: http://fishersandfarmers.org/

Fishery Diversity

Great Lakes Basin Fish Habitat Partnership (Board recognized October, 2009)

The international Great Lakes Basin is a unique and biologically diverse region containing the largest surface freshwater system in the world, with sport and commercial fisheries valued at over $7 billion annually. The fishery and aquatic resources of the Great Lakes have suffered detrimental effects from invasive species, loss of biodiversity, poor water quality, contaminants, loss or degradation of coastal wetlands, land use changes, and other factors.
See: www.fws.gov/partner/great-lakes-basin-fish-habitat-partnership

Great Plains' Species

Great Plains Fish Habitat Partnership (Board recognized October, 2009)

Streams of the Great Plains are home to a wide diversity of aquatic fauna adapted to harsh changes in temperature and water availability. Low human population density has enabled many Great Plains streams to remain relatively unimpaired, yet aquatic species have experienced a slow but steady decline in abundance and diversity during the 20th Century and continue to face challenges that threaten their viability.
See: www.prairiefish.org

Inland Streams

Hawaii Fish Habitat Partnership (Board recognized March, 2009)

The Hawaii Fish Habitat Partnership is composed of a diverse group of partners that plan and implement a technically sound statewide aquatic habitat restoration program with a special focus on inland waters including streams, wetlands, and estuaries. Our partners include local watershed coalitions; private landowners who seek to establish sustainable aquatic resource management practices on their lands; federal and State aquatic resource agencies; and Native Hawaiian groups that seek to preserve aquatic resources as a cultural and natural resource legacy.
See: www.fws.gov/pacificislands/hfhp.html

MISSION GOALS

Goal One: Protect and maintain intact and healthy aquatic systems
Goal Two: Prevent further degradation of fish habitats that have been adversely affected
Goal Three: Reverse declines in the quality and quantity of aquatic habitats to improve the overall health of fish and other aquatic organisms
Goal Four: Increase the quality and quantity of fish habitats that support a broad natural diversity of fish and other aquatic species

See: www.fishhabitat.org ("About")

Fish Habitat

Kenai Peninsula Fish Habitat Partnership (Board recognized January, 2010)

Kenai Peninsula Fish Habitat Partnership is a conservation partnership developing on the Kenai Peninsula, Alaska. This partnership is working with the National Fish Habitat Action Plan to protect, restore, and enhance the area's fish and aquatic communities.
See: www.kenaifishpartnership.org/

Development Pressures

Matanuska Susitna Basin Salmon Habitat Partnership (Board recognized October, 2007)

The Matanuska-Susitna Basin, or Mat-Su, covers 24,500 square miles in south central Alaska, roughly the combined size of Vermont, New Hampshire, and Massachusetts. The basin supports populations of chinook, coho, sockeye, pink, and chum salmon as well as world-class rainbow trout, char, and grayling, making it one of the country's premier sportfishing and wildlife viewing destinations. Salmon and other fish are at the heart of Alaskan ecosystems, economy, and culture. The basin is also one of the fastest growing regions in the country, presenting unique challenges and opportunities to ensure thriving fish, healthy habitats, and vital communities in one region. The Matanuska-Susitna Basin Salmon Habitat Partnership formed to address increasing impacts on salmon from human use and development pressures in the Mat-Su basin and ensure that opportunities for growth and conservation go hand-in-hand.
See: www.matsusalmon.org/

Lake Habitat

Midwest Glacial Lakes Partnership (Board recognized March, 2009)

Each year, millions of anglers fish on over 40,000 inland lakes across the Upper Midwest, seeking recreation, food, and the opportunity to catch "the big one." These lakes, which were naturally formed by glaciers, are essential in supporting biodiversity, including the many threatened and endangered species that live in them. Fish populations in Midwest glacial lakes are dependent upon the healthy habitats that lakes provide, allowing them to grow, reproduce, and thrive. Stress from human development along lake shorelines, water quality decline driven by development and agriculture in watersheds, changing climate, invasive species, and many other factors threaten these fish populations. The Midwest Glacial Lakes Partnership was created in 2009 to coordinate and improve the conservation of fish habitat in the over 40,000 lakes across the Upper Midwest.

The MGLP's partners work together to protect, rehabilitate, and enhance sustainable fish habitats in glacial lakes of the Midwest United States for the use and enjoyment of current and future generations. MGLP partners include the United States Fish and Wildlife Service; the United States Forest Service; the state natural resource agencies in Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin; national nonprofit organizations such as The Nature Conservancy; universities; and stakeholder organizations.
See: www.midwestglaciallakes.org/

Fish & Mussels

Ohio River Basin Fish Habitat Partnership (Board recognized October, 2009)

The Ohio River Basin Fish Habitat Partnership (Partnership) was formed to protect, restore, and enhance priority habitat for fish and mussels in the watersheds of the Ohio River Basin. The Partnership pursues this mission for the benefit of the public, but what brings partners to the table is as diverse as the basin itself. Whether it is sport fish, mussels, imperiled fish, water quality, or one of many other drivers, what bonds the partners is the Basin and the desire to work together to protect, restore, and enhance aquatic resources.
See: orbfhp.org/

Tribal Cultural Use

Pacific Lamprey Conservation Initiative (Board recognized June, 2016)

The Pacific Lamprey Conservation Initiative (PLCI) is a collaboration of Native American tribes, federal, state, municipal and local agencies working to conserve Pacific Lamprey throughout its range in California, Oregon, Washington, Idaho, and Alaska. The goal of the PLCI is to achieve long-term persistence of Pacific Lamprey and their habitats and support traditional tribal cultural use of Pacific Lamprey throughout their historic range in the United States. The intent of the partnership is to achieve this goal — where ecologically and economically feasible — by maintaining viable populations and their habitats in areas where they exist currently, restoring populations and their habitats where they are extirpated or at risk of extirpation, and doing so in a manner that addresses the importance of lamprey to tribal peoples. The PLCI envisions a future where threats to Pacific Lamprey and their habitats are reduced, and the historic geographic range and ecological role of Pacific Lamprey are restored to the greatest extent possible.
See: www.fws.gov/pacific/fisheries/sphabcon/lamprey/lampreyCI.html

Fish Habitat

Estuaries Habitat

Pacific Marine and Estuarine Fish Habitat Partnership (Board recognized January, 2012)

The Pacific Marine and Estuarine Fish Habitat Partnership's (PMEP'S) mission is to protect, enhance, and restore ecological habitats within estuaries and nearshore marine environments to sustain healthy native fish communities and support sustainable human uses that depend on healthy fish populations.

The PMEP originated in 2009 when representatives from Oregon, Washington, and California agencies and non-governmental entities met to discuss the need to protect and restore habitat for fish species that use estuaries and nearshore marine areas.

See: www.pacificfishhabitat.org/

Reservoir Management

Reservoir Fisheries Habitat Partnership (Board recognized October, 2009)

Reservoirs are inextricable parts of our natural landscapes — they cannot be isolated or dismissed in conservation management. Constructed to meet a variety of human needs, they impact almost every major river system in the United States, affecting to various degrees habitat for fish and other aquatic species and, in turn, affected by the health of the watershed in which they reside. Reservoirs, their associated watersheds, and their downstream flows constitute interdependent, functioning systems. Effective management of these reservoir systems — maintaining their ecological function and biological health — is essential to the conservation of our nation's aquatic resources and their habitats. It requires that we minimize the adverse impacts of reservoirs on their watersheds (and watersheds upon reservoirs) and maximize their utility for aquatic habitat.

See: www.friendsofreservoirs.com/

Conservation Goals

Southeast Alaska Fish Habitat Partnership (Board recognized March, 2014)

The Southeast Alaska Fish Habitat Partnership works to foster cooperative fish habitat conservation in freshwater, estuarine and marine ecosystems across the southern panhandle of Alaska, including the dynamic watersheds and waterways that make up the Alexander Archipelago. Covering nearly 17 million acres of this region is the Tongass National Forest, the largest national forest in the United States and a key producer of salmon. The Partnership's mission is to support cooperative fish habitat conservation, restoration, and management across the region with consideration of economic, social, and cultural interests of local communities in its efforts. The partnership's three priority conservation goals are to: 1) protect fish habitat in freshwater systems, estuaries, and nearshore-marine areas in Southeast; 2) maintain water quality and quantity in those areas; and 3) restore and enhance fragmented and degraded fish habitats in impacted areas.

See: www.seakfhp.org/

Species-Rich Shoreline

Southeast Aquatic Resources Partnership (Board recognized October, 2007)

Southeast Aquatic Resources Partnership (SARP) was initiated in 2001 to address the myriad issues related to the management of aquatic resources in the southeastern United States. SARP includes about 26,000 miles of species-rich aquatic shoreline and over 70 major river basins. The area faces significant threats to its aquatic resources, as illustrated by the fact that 34% of North American fish species and 90% of the native mussel species designated as endangered, threatened, or of special concern are found in the Southeast.

See: southeastaquatics.net/

Voluntary Efforts

Southwest Alaska Salmon Habitat Partnership (Board recognized May, 2008)

The Southwest Alaska Salmon Habitat Partnership is a made up of local communities, Native organizations, subsistence users, anglers, hunters, commercial fishing interests, lodge owners, hunting and fishing guides, tourism interests, non-profit organizations, federal, state, and local agencies and corporations and foundations working cooperatively to conserve fish, wildlife, and habitat and perpetuate the uses they support through voluntary habitat conservation in Southwest Alaska.

http://southwestsalmon.org/

Indicator Species

Western Native Trout Initiative (Board recognized February, 2008)

Trout are important as an "indicator species" of a watershed. When a watershed is in trouble, the trout are the first to die. Species like the greenback cutthroat, gila, and westslope cutthroat trout thrived in Western watersheds until their habitats were altered because of roads, dams, agriculture, and logging. Human introduction of non-native trout species, such as rainbow, brown, and brook trout put further pressure on native species by out-competing them for food and by eating native fry. Conservation of Western native trout and their habitats is critical in maintaining their cultural, scientific, and recreational value.

See: www.westernnativetrout.org

Fish Habitat

Newsletter Available

Conclusion

MORE TO COME!

Through project tracking, National FHP habitat conservation projects have reconnected 4,711 miles of rivers and streams; restored/rehabilitated 1,124 miles of rivers and streams; protected 11 miles of streams and rivers; protected 13,261 acres of habitat; and restored/rehabilitated 43,170 acres of river, lake, riparian, upland, estuary, and wetland habitat from 2006-2021. NFHP's monthly newsletter provides more about the organization and its accomplishments: sign up at www.fishhabitat.org. To participate, support, and learn more about the National Fish Habitat Partnership, its individual FHPs, and the Board, contact Ryan Roberts. Most of the FHPs also provide an option to sign up for their newsletters on their respective websites listed above.

Part 2 of this series on NFHP will more fully describe some of the NFHP achievements, and provide additional specifics about the overarching legislation that currently guides NFHP implementation.

For Additional Information:

Ryan Roberts, Association of Fish and Wildlife Agencies, 202/ 838-3466, rroberts@fishwildlife.org
National Fish Habitat Partnership website: www.fishhabitat.org

Reference List

National Fish Habitat Partnership:
www.fishhabitat.org
National Fish Habitat Action Plan:
www.fishhabitat.org/files/uploads/National_Fish_Habitat_Action_Plan_2006.pdf
National Fish Habitat Partnership Network (20 FHPs):
www.fishhabitat.org/the-partnerships/
Title II of America's Conservation Enhancement Act:
www.fishhabitat.org/files/uploads/PLAW-116publ188.pdf
National Fish Habitat Partnership Board:
www.fishhabitat.org/about/staff-board/
National Fish Habitat Partnership Progress Report:
www.fishhabitat.org/files/uploads/Final_NFHP_Report_to_Congress_2021-2022.pdf

Ryan Roberts is the Program Manager for the National Fish Habitat Partnership. Mr. Roberts has 15 years of experience in public relations/communications and has worked with the National Fish Habitat Partnership since 2008. Mr. Roberts created several communications toolkits for use by National Fish Habitat Partnerships and created an overall communication strategy for the partnership. Ryan's contributions were key in the development and release of the Status of Fish Habitat Partnership 2010 Assessment and the 2nd Edition of the National Fish Habitat Action Plan (2012).

Gary Whelan is one of the two co-chairs of the NFHP Board Science and Data Committee and has worked on NFHP since its inception. Mr. Whelan is a Program Manager for the Michigan Department of Natural Resources – Fisheries Division where he manages the Research Section, Fish Health Program, and parts of a Habitat Management Unit. His fisheries career has spanned almost 40 years and he has worked in nearly every aspect of fisheries in the State of Michigan. In his role for NFHP, he has been responsible for all of the Board's Science and Data efforts including the development and release of the Status of Fish Habitat Partnership 2010 and 2015 Assessments. He was also deeply involved in the development of the 1st (2006) and the 2nd Editions of the National Fish Habitat Action Plan (2012). Mr. Whelan holds a B.S. in Zoology (Fisheries Management focus) from the University of Wyoming and a M.S. in Fisheries Management from the University of Missouri.

Christopher Estes held a leadership role in the development of the 2006 NFHAP, formerly served as one of the original staff to the original NFHP Board, was an editor of the NFHAP 2012 edition, and has participated on the NFHP Board Science and Data Committee since its inception. Estes' career in aquatic resources and habitat conservation has spanned nearly 47+ years with a focus on instream flow and water level conservation. He is currently an Aquatic Resources & Habitat Scientist for Chalk Board Enterprises, LLC and serves as a Director at Large of the Instream Flow Council. Estes was the 2021 recipient of the Stanley A. Moberly Award for his Outstanding Lifetime Achievements and Contributions to Fish Habitat Conservation, an award co-sponsored by NFHP, the American Fisheries Society, and NOAA Fisheries.

WATER BRIEFS

TOXIC COAL ASH DUMPS US

CONTAMINATED GROUNDWATER

Seven years after the Environmental Protection Agency (EPA) imposed the first federal rules requiring the cleanup of coal ash waste dumps, only about half of the power plants that are contaminating groundwater agree that cleanup is necessary, and 96% of these power plants are not proposing any groundwater treatment. Only one plant out of 292 is planning a comprehensive cleanup. Although coal consumption has declined across the US over the last decade, the power industry continues to generate about 70 million tons of coal ash annually. Monitoring data shows that 91% of US coal-fired plants have ash landfills or waste ponds that are leaking arsenic, lead, mercury, selenium, and other metals into groundwater at dangerous levels, often threatening streams, rivers, and drinking water aquifers.

These are among the conclusions of a new report — "*Poisonous Coverup: The Widespread Failure of the Power Industry to Clean Up Coal Ash Dumps*" (Report) — by the Environmental Integrity Project (EIP) and Earthjustice (available on Earthjustice website, *see* below). The Report found that some power companies are illegally manipulating data and monitoring systems to avoid cleanup requirements and proposing inadequate cleanup strategies that will not restore groundwater quality. The Report also ranks the top 10 worst contaminated coal ash sites in the US and examines their cleanup status and compliance with the Coal Ash Rule. In addition, the authors compiled detailed information on groundwater contamination at 292 coal plants in 43 states (*see* Report pp.54-67).

Although no comprehensive study has been performed on the subject, drinking water wells in at least 15 communities across the US have been contaminated by metals from coal ash — including in Indiana, Maryland, North Carolina, Michigan and other states — and the true number may be much higher.

In 2015, in response to catastrophic coal ash spills at Duke Energy's Dan River Generating Station and nearly 160 cases of water contamination across the US, EPA established the first-ever regulations governing coal ash disposal, called the Coal Combustion Residuals Rule, also known as the Coal Ash Rule. The primary goals of the 2015 Coal Ash Rule were to stop the continued disposal of coal ash in leaking ash ponds, to close ash ponds and landfills in a safe manner, to monitor groundwater for contamination, and to clean up contaminated sites and restore groundwater quality.

An examination of public records and data from coal plants across the US revealed that the first goal has been partly achieved, because most coal plants are no longer sending coal ash to unlined ash ponds. But the Report shows that the other goals of the Coal Ash Rule have been thwarted by the utility industry, which is illegally manipulating data and monitoring systems to make contaminated sites look clean and to avoid cleanup.

Main findings of the Report include the following:

(Data based on self-reported monitoring by the industry that was made public as a requirement of the 2015 Coal Ash Rule.)

- The coal ash dumps at 91% of coal-fired power plants in the US (265 of 292) are contaminating groundwater with toxic pollutants. Only 4% of the plants (11) have selected cleanup plans that includes treating contaminated groundwater. Of these, only one plant is planning a comprehensive cleanup, with ten plants proposing incomplete cleanup plans.
- At nearly half of these plants (123 of the 265 contaminated plants), owners are not planning to take any cleanup action and most have denied responsibility for the contamination.
- The remaining 142 plants with contaminated groundwater agree that cleanup is necessary and have submitted a plan detailing possible cleanup options, but only 38 of these have committed to a specific cleanup plan. This is despite the Coal Ash Rule's requirement to select a remedy "as soon as feasible." At most disposal units, plant owners have illegally delayed remedy selection for three or more years.
- The Coal Ash Rule requires cleanup of both the source of pollution (coal ash) and the groundwater. Of the 38 plants that have committed to at least one cleanup action, 27 are not doing the second part: treating groundwater. They are instead relying on "monitored natural attenuation," which simply means watching and waiting for the pollution to disperse.
- Some power plants have multiple waste disposal sites, thus a total of 515 coal ash waste ponds were evaluated in this Report. Of these, there are 372 unlined ash ponds within five feet of groundwater, and many of these are sitting in groundwater. The majority (200) are being closed without removing the ash, despite being in or dangerously close to groundwater. Companies have closed 81 ponds by removing the ash and have scheduled the closure of another 91 by removal.
- About 70% of the coal ash ponds in or dangerously close to groundwater are located in lower income neighborhoods and/or communities of color.

In addition to analyzing problems with coal ash cleanup, the Report also details solutions to help accelerate cleanup and protect public health.

Proposed solutions include the following:

- Increased federal oversight: industry must fully comply with the federal Coal Ash Rule
- EPA should require enforceable cleanup schedules
- Plant-wide cleanup requirements
- Testing of drinking water near ash dumps
- Prohibition of dangerous coal ash reuse

For info: Valerie Holford, Earthjustice, 202/ 365-5336, valerieholford@starpower.net or https://earthjustice.org/ >> Our Work >> Press Room; Tom Pelton, EIP 443/ 510-2574 or tpelton@environmentalintegrity.org

WATER BRIEFS

LAKE MEAD & POWELL WEST

NEW OPERATING GUIDELINES

On October 28th, the Department of the Interior (Department) announced expedited steps to prepare new measures that, based on current and projected hydrologic conditions, are needed to improve and protect the long-term sustainability of the Colorado River System (System). To address the serious operational realities facing the System, the Bureau of Reclamation (Reclamation) is initiating an expedited, supplemental process to revise the current interim operating guidelines for the operation of Glen Canyon and Hoover Dams in 2023 and 2024 in order to provide additional alternatives and measures needed to address the likelihood of continued low-runoff conditions across the Basin.

"The Interior Department continues to pursue a collaborative and consensus-based approach to addressing the drought crisis afflicting the West. At the same time, we are committed to taking prompt and decisive action necessary to protect the Colorado River System and all those who depend on it," said Interior Secretary Deb Haaland. "Revising the current interim operating guidelines for Glen Canyon and Hoover Dams represents one of many critical Departmental efforts underway to better protect the System in light of rapidly changing conditions in the Basin."

Reclamation will publish a Notice of Intent (NOI) to prepare a Supplemental Environmental Impact Statement (SEIS), which will include proposed alternatives to revise the December 2007 Record of Decision associated with the Colorado River Interim Guidelines. The 2007 Interim Guidelines provide operating criteria for Lake Powell and Lake Mead, including provisions designed to provide a greater degree of certainty to water users about timing and volumes of potential water delivery reductions for the Lower Basin States, and additional operating flexibility to conserve and store water in the system.

The NOI outlines that, in order to ensure that Glen Canyon Dam (Lake Powell) continues to operate under its intended design, Reclamation may need to modify current operations and reduce Glen Canyon Dam downstream releases, thereby impacting downstream riparian areas and reservoir elevations at Lake Mead. Additionally, in order to protect Hoover Dam operations (Lake Mead), system integrity, and public health and safety, Reclamation may also need to modify current operations and reduce Hoover Dam downstream releases.

As described in the NOI, this SEIS will analyze alternatives including:

- Framework Agreement Alternative: This alternative would be developed as an additional consensus-based set of actions that would build on the existing framework for Colorado River Operations. This alternative would build on commitments and obligations developed by the Basin States, Tribes and non-governmental organizations as part of the 2019 Colorado River Drought Contingency Plan (DCP) Authorization Act.
- Reservoir Operations Modification Alternative: This alternative would be developed by Reclamation as a set of actions and measures adopted pursuant to Secretarial authority under applicable federal law. This alternative would also consider how the Secretary's authority could complement a consensus-based alternative that may not sufficiently mitigate current and projected risks to the Colorado River System reservoirs.
- No Action: The No Action Alternative will describe the continued implementation of existing agreements that control operations of Glen Canyon and Hoover Dams. These include the 2007 Interim Guidelines and agreements adopted pursuant to the 2019 DCP. Intensive ongoing efforts to achieve water conservation actions in the Basin are underway through a number of programs, including the recent Inflation Reduction Act. Implementation and effectiveness of these efforts will inform the assessment of existing operations and agreements.

This action builds on steps announced in August 2022 as part of Reclamation's release of the Colorado River Basin August 2022 24-Month Study, as well as additional actions announced in September 2022 to reduce water consumption across the Basin in light of critically low water supplies and dire hydrological projections.

The Department also recently announced new drought mitigation funding opportunities to provide reliable, sustainable and equitable water and power supplies across the Basin. A newly created Lower Colorado River Basin System Conservation and Efficiency Program, funded with an initial allocation through the Inflation Reduction Act, will help increase water conservation, improve water efficiency, and prevent the System's reservoirs from falling to critically low elevations that would threaten water deliveries and power production. The Inflation Reduction Act includes $4 billion in funding specifically for water management and conservation efforts in the Colorado River Basin and other areas experiencing similar levels of drought.

The NOI announced October 28th to address immediate challenges, does not interfere with Reclamation's separate process for determining post-2026 Colorado River Operations.

Members of the public interested in providing input on the SEIS can do so through December 20, 2022, per instructions in the Federal Register that will be published in the coming days.

For info: Reclamation's Lower Colorado Basin Website at: www.usbr.gov/lc/index.html

WATER BRIEFS

WAVE ENERGY US
WEC ANALYSIS TOOL

Wave energy converters, or WECs, come in many shapes and sizes and create different amounts of energy in different types of waves. That means a WEC that performs well in the big waves of California's Humboldt Bay will not necessarily be efficient at capturing the energy of the low and slow swells in North Carolina's Outer Banks. "Wave energy is not like traditional energy sources where you put in this much fuel, and you know, you get this much power," said Jim McNally, an engineer at the National Renewable Energy Laboratory (NREL). "There are so many variables that you need to account for in order to get a real estimate."

To account for these variables, researchers from the US Department of Energy's Water Power Technologies Office and NREL collaborated on the recently developed Small WEC Analysis tool, an online, publicly available graphical user interface. The goal of the site is to provide baseline information about the performance of different types of WECs in various ocean settings.

The tool was designed to make it easy for users to compare four common WEC models:

• Attenuators: multisegment devices that float parallel to ocean waves and rise and fall, creating a flexing motion that drives turbine rotation or a hydraulic pump

• Oscillating surge WECs: devices that have a vertical flap affixed to the seabed, which generates energy from the back-and-forth motion of waves

• Single-body point absorbers: simple buoys connected to the seabed that create energy from the up-and-down motion of waves

• Two-body point absorbers: buoys attached to a "heave" plate on the seabed that resists the motion of the buoy, which in turn creates energy

For the first time, the Small WEC Analysis tool enables users to compare different WECs' performance on an apples-to-apples basis. "You used to have to dig through different documentation on different types of WECs at different locations," McNally said. "Here you can really see how a machine will work in certain environments."

Because of the harsh marine environments WECs must operate in — and the complex regulatory requirements imposed on device deployments — advancements in wave energy technology have been slow. Although they may not be huge, small-scale WECs could help meet the needs of small communities and projects, and the data found in the Small WEC Analysis Tool will help identify the best WECs for the job.

For info: www.nrel.gov/ >> Small WEC Analysis Tool

ASR PROGRAM AWARD OR
SUPPLY RESILIENCY

During its 97th Annual Conference on October 6th, the League of Oregon Cities (LOC) presented its 2022 Award for Excellence to the City of Prineville (Prineville) for its Aquifer Storage and Recovery project. The award recognizes progressive and innovative city operations and services.

Central Oregon, and especially Prineville, are experiencing an unprecedented "megadrought." As climate change intensifies water insecurity, Prineville's Aquifer Storage and Recovery (ASR) project offers an environmentally sustainable and cost-sensitive solution to mitigate the impacts of drought and support economic development. Prineville's ASR is a water management tool that allows the City to meet peak demands by taking advantage of the natural storage space found in geologic formations underground.

The storage and recovery system works by injecting and storing treated drinking water in an aquifer during the winter. With the City's ASR, groundwater is pumped from the Prineville Valley floor and stored in the Airport Area Aquifer System during periods of cooler temperatures, higher stream flow, and low water demand. The stored water can later be recovered and used during periods of hotter temperatures and higher water demand, thereby easing peak demand stress on naturally occurring water sources and reducing the need to build expensive storage facilities.

The system also adds supply resiliency by providing an underground reservoir for use during a prolonged drought or production supply interruption. Surface water from the Prineville Reservoir is released to negate the impact of developing the injection water, and the Oregon Department of Fish & Wildlife has partnered with the City to manage these releases.

Implemented in 2019, the project is so far exceeding its goals, as groundwater levels in the local aquifer increased by 11 feet last year. Prineville's ASR system is also expected to mitigate long-term impacts of climate change, including reduced snowpack and stream flows.

For info: Kevin Toon, ktoon@cities.org or cityofprineville.com >> Aquifer Storage and Recovery

CESSPOOL CLOSURE HI
LARGE CAPACITY

The US Environmental Protection Agency (EPA) has taken an enforcement action to close two illegal **l**arge **c**apacity **c**esspools (LCCs) at the Wailuku Professional Plaza in Hilo and one cesspool at the SKS Management LLC self-storage business in Kailua-Kona. Under the Safe Drinking Water Act, EPA banned LCCs in 2005.

The Wailuku Professional Plaza is located about 100 feet from the Wailuku River in Hilo. In July 2021, EPA conducted an inspection of the Plaza and found two unlawful cesspools serving the multi-tenant commercial office building. Wailuku Professional Plaza, LLC — which owns and operates the Wailuku Professional Plaza – settled the case, agreeing to close the illegal cesspools and pay a $43,000 penalty on May 4, 2022.

EPA also found that the Power Self Storage — Kuakini facility in Kailua-Kona has a restroom that is served by a large capacity cesspool. SKS Management LLC — the facility's operator — settled the case, agreeing to pay a $28,780 penalty and close the illegal cesspool by September 1, 2023.

These cesspools meet the regulatory criteria of unlawful non-residential large capacity cesspools because they have the capacity to serve 20 or more persons per day. EPA is authorized

to issue compliance orders and/or assess penalties to violators of the Safe Drinking Water Act's cesspool regulations. Cesspools collect and release untreated raw sewage into the ground, where disease-causing pathogens and harmful chemicals can contaminate groundwater, streams, and the ocean.

Since the 2005 federal ban, more than 3,750 large capacity cesspools in Hawaii have been closed; however, hundreds remain in operation. Cesspools are used more widely in Hawaii than any other state and pose a unique challenge as groundwater provides 95% of all water supply for the islands.

To encourage regulated entities to voluntarily discover, promptly disclose, and expeditiously close these pollution-causing systems, EPA provides penalty mitigation and other incentives for companies that proactively find and close LCCs on their property. Information on how to self-disclose potential large-capacity cesspool violations is available at: www.epa.gov/compliance/epas-edisclosure.
For info: EPA Webpage on Large-Capacity Cesspools at: www.epa.gov/uic/large-capacity-cesspools

ENERGY STORAGE CA
PUMPED STORAGE

The San Vicente Energy Storage Facility is one of the most promising pumped energy storage solutions in California. The project is under consideration by a partnership of the San Diego County Water Authority and the City of San Diego. As proposed, the project could store 4,000 Megawatt-hours per day of energy (500 Megawatts of capacity for eight hours), which is enough energy to provide approximately 135,000 homes with power.

The potential project would create a small upper reservoir above the San Vicente Reservoir, along with a tunnel system and an underground powerhouse to connect the two reservoirs. The powerhouse is proposed to contain four reversible pump turbines. During off-peak periods — when power is inexpensive and renewable supplies from wind and solar facilities exceed demand — turbines will pump water to the upper reservoir where it will act as a battery of stored potential energy. During high energy use, the system will discharge energy as water from the upper reservoir flows downhill through the turbines. The exchange between the two reservoirs will not consume water and is closed-loop.

The reservoir is near major electricity transmission interconnection facilities, which will allow the project to play a central role in integrating solar and wind energy from across the Southwest for use in San Diego County.

In July 2021, San Vicente Energy Storage Facility received $18 million from the state budget, enough to advance the project through initial design, environmental reviews, and the federal licensing process. The City of San Diego and the Water Authority are currently negotiating a project development agreement with the BHE Kiewit Team to develop Phase 1 of the potential San Vicente Energy Storage Facility Project.
Regional benefits include:
• Generate additional revenue to offset water agency costs and help stabilize water rates
• Provide an essential energy resource to enhance grid reliability to avoid power outages and rolling blackouts
• Produce energy on demand, especially during high-energy use periods
• Store surplus renewable wind and solar energy during low-energy use periods
• Reduce greenhouse gas emissions
For info: www.sdcwa.org/projects/san-vicente-energy/

CANAL PIPING PROJECT OR
IRRIGATION CONSERVATION

Amid historic drought, Central Oregon Irrigation District (COID) completed the first phase of its canal-to-pipe water conservation project, benefiting farmers and the Deschutes River. Despite a challenging irrigation season, the district completed the project on time and delivered 21 cubic feet per second (cfs) of conserved water through its pipe to North Unit Irrigation District (NUID). As a result, NUID will forgo an equal amount of storage from Wickiup Dam this winter, with the specific timing of additional flow in the Deschutes River to be determined in coordination with the US Fish and Wildlife Service (USFWS).

One hundred percent of the water conserved through the 7.9-mile piping project between Redmond and Smith Rock is being used to address flow imbalances in the Upper Deschutes to address the habitat requirements associated with the Oregon Spotted Frog. Farmers were able to access much of their live flow and stored water supplies that were available, even with the drought, while simultaneously supporting fish and wildlife habitat and remaining in compliance with the Endangered Species Act.

Craig Horrell, Central Oregon Irrigation District Manager, said due to the drought, an early season canal breach, and working through kinks with the new system, the district delivered 21 cfs rather than 30 cfs as expected. "This is just the beginning of our conservation plan to boost releases by 200 cfs over the next seven years to meet the requirements of the Deschutes Basin Habitat Conservation Plan."

As recommended by USFWS, the districts began releasing 105 cfs this week with the long-term goal to sustainably increase winter flows. The 21 cfs from COID's conserved water piping project will be released at a later date to benefit the Oregon Spotted Frog. Per the Plan, conserved water can either be added to the base flow in the river all winter — approximately an additional 20 cfs for this winter — or the total volume of approximately 7,000 acre-feet can be released later in the season.

Upper Deschutes River winter flows are anticipated to dramatically increase from 100 cfs to new flow rates determined through the Deschutes Basin Habitat Conservation Plan (Plan). Increasing the flows in the Deschutes River is critical for the Oregon Spotted Frog, listed as a threatened species under the Endangered Species Act in 2014.

The Plan signed between the USFWS and irrigation districts in the Deschutes Basin requires that the amount of water flowing in the Deschutes below Wickiup Dam be a minimum of 100 cfs until 2028 when the level will increase to 300 cfs. The Plan provides a roadmap for sustainable

WATER BRIEFS

water management in the Deschutes Basin while promoting the conservation and recovery of a species listed under the Endangered Species Act. Prior to agreements made between the USFWS and irrigation districts, the level of water flowing out of Wickiup in winter was as low as 20 cfs. The smaller releases allowed Wickiup to refill faster in winter than it can today. With potentially less storage water available, irrigation districts are now piping their canals as a way to conserve water for farmers.

Established in 1918, COID's mission is to provide a reliable supply of water to 3,500 patrons throughout Bend, Redmond, Powell Butte, and Alfalfa. COID operates and maintains over 400 miles of canals that collectively deliver water to approximately 46,222 acres of productive land. Since 2000, COID has increased stream flows in the Deschutes Basin by 133.57 cfs through conserved water projects and permanent instream transfers.

For info: Craig Horrell, COID, 541-480-7773, chorrell@coid.org or www.coid.org

WATER BANK PILOT OR FORBEARANCE PROGRAM

The Deschutes River Conservancy (DRC), in partnership with Central Oregon Irrigation District (COID) and North Unit Irrigation District (NUID), is continuing its 2022 Deschutes Water Bank Pilot Program. The program is a local, flexible, and voluntary water management tool, which allows for easier movement of water to meet farmer and river needs in times of scarcity.

The Deschutes Water Bank Pilot Program provides an opportunity for COID patrons along the Pilot Butte Canal to receive a cash payment to forego using their water for the 2023 irrigation season. The water will then be made available to North Unit Irrigation District during the irrigation season and will help to restore winter flows in the Upper Deschutes River. Water banked in the 2022 program will contribute to the beleaguered reach of the Upper Deschutes to support fish and wildlife habitat when flows drop this fall. The Water Bank program complements and provides additional flows to the DRC's well-established instream lease program, which compensates water users to lease their water directly instream.

Partners in the Deschutes Basin have been working together for decades to solve long-standing water management inequities. Large-scale water conservation projects are underway and are a foundational part of the solution. This Water Bank Pilot Program brings market-based tools, alongside water conservation efforts, to increase the pace and scale of solutions that restore rivers while keeping farmers whole.

The Deschutes River has persistent flow restoration needs based on the overallocation of the river over 100 years ago. As the most junior irrigation district, North Unit Irrigation District faces water insecurity and suffered severe shortages and economic consequences in 2022 due to extreme drought. The Water Bank Pilot Program offers a triple benefit — flexibility and incentive payments for senior water users who are willing to forgo their water use, increased water supply for North Unit Irrigation District, and restored flows in the river.

Mike Britton, North Unit Irrigation Executive Manager said, "This program is a great example of how potentially conflicting water interests can work together in powerful ways. NUID will be able to reasonably purchase critically needed irrigation water from COID to help keep our commercial farmers viable during ongoing drought. We will in turn be releasing a portion of this pilot water in the Upper Deschutes the following winter." Raising flows in the Upper Deschutes River is a requirement of the Deschutes Basin Habitat Conservation Plan and NUID's contribution to winter flows will help meet these requirements.

For additional information about the partners in the Water Bank, check out their websites: www.deschutesriver.org; www.coid.org; and www.northunit.com.

For info: Kate Fitzpatrick, DRC, 541/382-4077 x 118, kate@deschutesriver.org or www.deschuteswaterbank.org

EPA CONTAMINANTS LIST US CANDIDATES LIST WIH PFAS

On November 2nd, EPA published the Final Fifth Drinking Water Contaminant Candidate List (CCL 5), which will serve as the basis for EPA's regulatory considerations over the next five-year cycle under the Safe Drinking Water Act. This update includes a substantial expansion of per- and polyfluoroalkyl substances (PFAS), an important first step towards identifying additional PFAS that may require regulation under the Safe Drinking Water Act.

A year ago, EPA published the PFAS Strategic Roadmap, outlining an Agency-wide approach to addressing PFAS in the environment. Today's announcement strengthens EPA's commitment to protect public health from impacts of PFAS and support the Agency's decision-making for potential future regulations of PFAS. In addition to a group of PFAS, the Final CCL 5 includes 66 individually listed chemicals, two additional chemical groups (cyanotoxins and disinfection byproducts (DBPs)), and 12 microbes.

In developing the Final CCL 5, EPA requested public nominations, providing an opportunity for people to make recommendations to the Agency about specific contaminants of concern that may disproportionally affect their local community. EPA further enhanced the CCL process based on comments received on this CCL and previous CCLs, including by prioritizing data most relevant to drinking water exposure, improving considerations of sensitive populations including children, and considering the recommendations included in the Review of the EPA's Draft Fifth Contaminant Candidate List (CCL 5) report from the Science Advisory Board (https://sab.epa.gov/ords/sab/f?p=100:18:14475496335862:::RP,18:P18_ID:2600#report). These improvements resulted in a Final CCL 5 that can better inform prioritization of contaminants for potential regulatory actions and/or research efforts.

For info: EPA website at: www.epa.gov/ccl/contaminant-candidate-list-5-ccl-5

WATER BRIEFS

PFAS CONTAMINATION IL

SAMPLE/TREATMENT ORDER

On November 3rd, EPA announced that the 3M Company agreed to a US Environmental Protection Agency (EPA) order to sample and provide treatment to address contamination from per- and polyfluoroakyl substances (PFAS) found in drinking water in the vicinity of 3M's Cordova, Illinois facility. Recent sampling results provided by 3M indicate the widespread presence of a mixture of at least 19 different PFAS chemicals in drinking water within a three-mile radius of the Cordova facility. Given the unique circumstances affecting this community — including more than five decades of PFAS discharges and the many types of PFAS chemicals found — EPA has concluded that the situation constitutes an imminent and substantial endangerment under the federal Safe Drinking Water Act.

"I have directed EPA staff to use every enforcement tool at our disposal to require manufacturers of PFAS to address potential endangerment to the public and to compel them to characterize, control, and clean up ongoing and past PFAS contamination," said EPA Administrator Michael S. Regan. "Communities have suffered far too long from exposure to these chemicals. This settlement is a critical step forward in our work to protect communities from pollution and hold polluters accountable for their actions."

As part of this settlement, 3M is required to offer treatment to all private well owners within three miles of the facility and to the Camanche Water Supply in Iowa, in an effort to remove PFAS from the drinking water. 3M is also required to offer drinking water sampling out to four miles from the facility for private well owners and out to ten miles from the facility for public water systems as well as to the Quad Cities' public water systems, using EPA protocols and conducted under EPA oversight.

3M's sampling of the drinking water in private wells near the facility detected a range of concentrations including: perfluorooctanoic acid (PFOA) of non-detect to 25 ppt, perfluorooctanesulfonic acid (PFOS) of non-detect to 30 ppt, hexafluoropropylene oxide dimer acid (HFPO-DA), or "GenX" of non-detect to 59 ppt, and perfluorobutane sulfunate (PFBS) of non-detect to 51 ppt. 3M did not use EPA test methods for this sampling. As a result, the order requires 3M to sample these wells again following EPA test methods.

3M was one of the original companies developing and producing PFAS within the US, and their Cordova facility operations and discharges containing PFAS chemicals date back to the 1970s. 3M's agreement to the terms of the Order, including completing the work required under EPA's oversight, is an important step to begin addressing the problem created by decades of contamination.

For info: EPA Website on 3M Cordova at: https://www.epa.gov/il/3m-cordova; EPA's PFAS Website at: https://www.epa.gov/pfas

STATE WATER PROJECT CA

2021 BIENNIAL REPORT

As California enters a possible fourth dry year, the California Department of Water Resources (DWR) released its biennial report on November 2nd to help water managers better understand how key factors — like climate change and regulatory and operational considerations — affect the operation of the State Water Project (SWP) under historical and future scenarios.

The State Water Project (SWP) provides water to 27 million Californians and 750,000 acres of farmland throughout the state. In the State Water Project Final Delivery Capability Report 2021, there are estimates on SWP's water delivery capability for current and future conditions based on three major factors:

- The effects of population growth on California's balance of water supply and demand
- State legislation intended to help maintain a reliable water supply
- Impact of potential climate change-driven shifts in hydrologic conditions

"The delivery capability of the SWP system is an important component in water supply planning and ultimately affects the amount of water available for use in California," said Erik Reyes, Manager of DWR's Modeling Support Office. "The availability of these water supplies may be highly variable from year to year, especially in the face of climate change and drought. Having estimates on how much water the public water agencies could receive in a given year from the SWP — whether they be wet, dry, or somewhere in between — gives these agencies information they need to make decisions about increased conservation measures, plans for new facilities, or additional water supply sources to meet local needs."

While many of the assumptions of SWP operations described in the 2019 Report remain the same in this 2021 update, the most significant changes are due to the water resources model's improvements that include water supply estimates with updated hydrology and more geographic and operational detail.

The next report in 2023 will expand on the potential impacts of a shift to a hotter, drier future. This new modeling will be critical to helping the public water agencies that receive water from the SWP prepare for ongoing impacts to our water supply from climate change. The report is provided to the SWP's 29 water agencies located statewide and is released every two years.

For info: https://water.ca.gov >> State Water Project Deliveries

CANAL UPGRADE NV

TRUCKEE CANAL LINING

Reclamation and Truckee-Carson Irrigation District have broken ground on a $35 million construction project funded by the Bipartisan Infrastructure Law to restore safe, long-term operation of the Truckee Canal. The event marked the beginning of Phase 1 of a multi-phased construction project known as the Truckee Canal Extraordinary Maintenance Project. Phase 1 includes lining approximately 3.5 miles of the earthen canal in the most vulnerable stretch in the City of Fernley to support structural integrity and community safety.

WATER BRIEFS

The Truckee Canal originates at the Derby Diversion Dam on the Truckee River, approximately 20 miles east of Reno and ends at Lahontan Reservoir. As part of the Newlands Projects, one of the first Reclamation projects in the country, the canal provides water for over 50,000 acres of farmland.

In 2008, Fernley, suffered a canal breach damaging 590 properties and causing significant flooding. The project will provide water reliability for farmers throughout the region

For info: Truckee Canal webpage: www.usbr.gov/mp/lbao/truckee-canal.html

LEAD REDUCTION US EPA STRATEGY

EPA released its Strategy to Reduce Lead Exposures and Disparities in US Communities (Lead Strategy), in conjunction with National Lead Poisoning Prevention Week.

Lead exposure can cause adverse health effects in almost every organ and system in the human body. The nervous system is the main target for lead in children and adults and exposure can result in irreversible and lifelong decreases in learning, memory, and attention. Ongoing exposures to lead in the environment present a health risk to many people nationwide. This is especially true in communities overburdened by pollution, which are disproportionately communities of color and low-income communities.

EPA's Lead Strategy aims to: reduce community exposures to lead sources; identify communities with high lead exposures and improve their health outcomes; improve engagement with communities and stakeholders; and support critical research to inform efforts to reduce lead exposures and related health risks. The Bipartisan Infrastructure Law includes $15 billion in dedicated funding to replace lead pipes and service lines and remove lead from soil and contaminated sites. These investments include: $1.16 billion to support lead service line projects in 21 states, District of Columbia, and three territories; $600 million to cleanup construction projects at more than 50 Superfund sites where lead is a contaminant of concern; and $25 million over the next five years to support small and disadvantaged communities in the development of lead service line identification technologies.

Actions in the Lead Strategy include:

- Lead Service Line Replacement Accelerators, which will provide targeted technical assistance and develop best practices to help address the barriers disadvantaged communities face in replacing lead service lines.
- New federal agency collaboration with the Food and Drug Administration and the Consumer Product Safety Commission to address lead in food, cosmetics, and other consumer goods.
- The development of new educational and engagement materials on children's health and maternal health regarding lead and heavy metals in cultural products and cookware.

For info: EPA website: www.epa.gov/lead ("Spotlight")

WASTEWATER LAGOONS US EPA ACTION PLAN

EPA has released its Lagoon Wastewater Treatment Action Plan and announced nearly $2 million in research grant funding to accelerate innovative and alternative wastewater treatment technologies in lagoon and pond systems serving small communities. Through research grants and the first ever Lagoon Action Plan, EPA is providing resources and assistance that will help improve public health and clean waterway protections for rural, small, and Tribal communities that rely on lagoon wastewater treatment systems.

Contamination from wastewater in rural areas may pose a potential threat to small drinking water systems and private wells relying on multiple drinking water sources. Small and rural communities along with private well owners may lack advanced drinking water treatment capabilities along with the financial, technical, and human resource capacity to ensure that they have clean and safe drinking water supplies.

Lagoon-based **w**aste**w**ater **t**reatment **p**lants (WWTPs) have been widely used in the United States and around the world for municipal, agricultural, and industrial applications. These systems are particularly attractive to small communities because of their low operating cost, built-in solids storage, and low minimal operating requirements. There has been limited information available on the performance, reliability, impacts, capital costs, and operations and maintenance costs of various lagoon technologies and on their ability to consistently remove ammonia and nutrients.

"Many small and rural communities in the United States rely on a wastewater treatment process that falls short of environmental and public health protection," said EPA Assistant Administrator for Water Radhika Fox. "The Lagoon Action Plan will help communities with lagoon systems ensure their local water quality isn't impacted by improper wastewater management."

Lagoon wastewater treatment systems are a common form of decentralized wastewater treatment that uses earthen ponds to break down wastewater using natural biological processes.

The Lagoon Action Plan outlines critical actions that EPA will implement through 2026 to assist rural, small, and Tribal communities with lagoon wastewater treatment systems. The Plan will identify how many lagoon wastewater treatment systems are in the United States. The Plan provides for financial and technical assistance tools — including tools to help underserved communities access Bipartisan Infrastructure Law funding; develop cost and performance data for technologies, regulatory support tools, and plans for community engagement, communication, and partnerships.

EPA is awarding $2 million to research and provide information that can help small communities deploy demonstrated innovative water technologies for lagoon systems, which will help achieve better nutrient management in a cost-effective manner. The following universities will be receiving an award:

- Michigan Technological University, Houghton, Mich., to deploy and test a floating treatment wetland system in a lagoon in a small community in northern Michigan.
- West Virginia University, Morgantown W.Va., to evaluate current and potential technology options to remove nutrients from lagoons systems and use this information to develop a decision-support tool that can be used to determine cost-effective technologies that can improve nutrient removal in lagoon systems in small communities.

For info: Action Plan at: www.epa.gov/system/files/documents/2022-10/Lagoon%20Action_Plan_FINAL.pdf

CALENDAR

November 15-17 CA
American Water Summit 2022, Los Angeles. Marriott Los Angeles Airport. 12th Annual Meeting for Senior Executives Within the North American Water Sector. For info: https://americanwatersummit.com/

November 16 AZ
Desert Agriculture Research Symposium, Yuma. Pivot Point Convention Center. Research Needs of the Desert Agriculture Industry, Current Research, Develop Partnerships & Engage With Industry. For info: https://desertagsolutions.org/events/556-desert-agriculture-research-symposium

November 16-17 KS
Governor's Conference on the Future of Water in Kansas, Manhattan. Hilton Garden Inn and Conference Center. 11th Year of the Conference. For info: www.kwo.ks.gov

November 16-18 DC
31st Eastern Boot Camp on Environmental Law, Washington. Arnold & Porter LLP. Presented by Environmental Law Institute: In-Person & Virtually; Registration and Payment Deadlline is Oct. 31st. For info: www.eli.org/boot-camp/eastern-registration

November 17 WEB
Wetlands in Washington Conference: Waters of the US & Recent Judicial and Administrative Developments Impacting Wetlands, Interactive Online Broadcast. For info: Law Seminars Int'l, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

Nov 27-Dec. 1 Israel
Learning from Drylands – 8th International Conference, Midreshet Ben-Gurion. Ben-Gurion University of the Negev. Drylands, Deserts & Desertification. For info: https://dddconf.org

November 29-Dec. 1 CA
ACWA 2022 Fall Conference & Exhibition, Indian Wells. Renaissance Esmeralda & Hyatt Regency. Presented by Association of California Water Agencies. For info: www.acwa.com/events/2022-fall-conference-exhibition/

December 5 CO
Colorado Water Law 16th Annual Conference - Adaptation in a Changing Environment, Denver. Embassy Suites Downtown. For info: CLE International: 800/ 873-7130 or www.cle.com

December 6 WEB
Judging in a Changing Climate: Lessons from Water Courts - Webinar. 12:30pm-1:45pm EST. Presented by Environmental Law Institute: Webinar Only; Free - Must Register by Dec. 4th. For info: www.eli.org

December 6-7 AZ
Western Governors Association Winter Meeting, Phoenix. Arizona Biltmore. For info: www.westgov.org

December 6-8 France
UN-Water Summit on Groundwater 2022, Paris. Hybrid Presentation: In-Person at UNESCO HQ & Remotely: "Groundwater: Making the Invisible Visible" - 7-8 December 2022; Pre-Summit Side - Events 6 December 2022. Implemented by the Dedicated UN-Water Task Force and Co-Coordinated by UNESCO and the International Groundwater Resources Assessment Centre (IGRAC), on behalf of UN-Water; Registration is Free. For info: groundwater-summit.org

December 8-9 WA
Washington Water Code Conference - 15th Annual, Seattle. Courtyard Marriott Seattle Downtown/Pioneer Square. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net or theseminargroup.net

December 9 WEB
Legal and Regulatory Challenges and Opportunities in an Era of Climate Change – Virtual Roundtable, Two Part, Four Session: Explores Evolving Legal & Regulatory Challenges of Water Utilities & the Water Sector in the Post-COVID Era of Climate Change. For info: https://engage.awwa.org/PersonifyEbusiness >> Webinars

December 12-13 WEB
Fundamentals of SCADA in Water Treatment Facilities - Online Course, For info: www.euci.com or 303/770-8800

December 14-16 NV
Colorado River Water Users Association 2022 Conference, Las Vegas. Caesars Palace. For info: www.crwua.org/future-conferences.html

December 15-16 CA
CEQA 18th Annual Conference: New Developments & Practice Challenges for 2022, San Francisco. Grand Hyatt Hotel. For info: CLE International: 800/ 873-7130 or www.cle.com

January 10-12 TX
Ten Across Summit: The Future is Here, Houston. Hotel Zaza Museum District & Asia Society Texas Center. RE: Critical Issues & Solutions Impacting the Region. For info: https://na.eventscloud.com/website/21653/

January 4-7 CO
Sustainability & Ski CLE: Environmental, Land Use & Natural Resources Law Conference, Vail. Grand Hyatt Vail. For info: CLE International: 800/ 873-7130 or www.cle.com

January 23-24 WEB
Cybersecurity for Water Utilities: Most Common Threats, Counter Measures, & More - Online Course, For info: www.euci.com or 303/770-8800

January 25-27 CO
Colorado Water Congress 2023 Annual Convention, Aurora. Hyatt Regency Aurora-Denver Convention Center. For info: cowatercongress.org

The Water Report
Water Rights, Water Quality & Water Solutions in the West
3615 W. Hills of Gold Drive
Tucson, AZ 85745

CALENDAR

(continued from previous page)

January 26-27 WA
30th Annual Endangered Species Act Conference, Seattle. Crowne Plaza Seattle Downtown; In Person, Live Webcast or On Demand. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net or theseminargroup.net

January 26-27 WEB
Electric Power in the West Conference, Live Interactive Online Broadcast. For info: Law Seminars Int'l, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

Feb 16-17 VA & WEB
Environmental Law Conference - Hybrid Event, Arlington. Environmental Law Institute Co-Sponsored with ALI CLE. For info: www.ali-cle.org/course/ce008p; or www.eli.org

Feb 28-March 2 DC
ACWA DC 2023 Annual Washington, D.C. Conference, Washington. St. Regis Hotel. Presented by Association of California Water Agencies. For info: www.acwa.com/events/

March 2-5 OR
"Reconnecting and Transitioning Together" - Public Interest Environmental Law Conference, Eugene. University of Oregon School of Law. 41st Annual Presented by Land Air Water Environmental Law Society. For info: pielc.org

March 4-8 GA
38th Annual WateReuse 2023 Symposium, Atlanta. Marriott Marquis Atlanta. For info: https://watereuse.org/news-events/conferences/

March 9-10 CA
Sustainable Water Investment Summit, Palos Verdes Peninsula. Terranea Resort. Water Finance From Risk Management to Water Transfer & Storage Strategies; Presented by Brownstein & WestWater Research. For info: sustainablewaterinvestment.com

March 10 CA
Contaminated and Distressed Properties Seminar, Los Angeles. TBA. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net or theseminargroup.net

March 14 NE
Nebraska Floodplain Management Workshop, Lexington. Dawson County Opportunity Center. For info: https://dnr.nebraska.gov/floodplain/training-and-workshops

May 7-10 AZ
National Association of Environmental Professionals Annual Conference, Phoenix. Sheraton Phoenix Downtown Hotel. Conference & Training Symposium. For info: www.naep.org/

May 8-9 NE
Water for Food Global Conference, Lincoln. University of Nebraska. Presented by the Daugherty Water for Food Global Institute. For info: https://waterforfood.nebraska.edu/