

Tunnel Vision Part One: Delta in Peril

How Jerry Brown's plan to build two giant water tunnels could devastate the largest estuary on the West Coast.

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Nearly everyone in California drinks freshwater from distant rivers or streams. The East Bay taps the Mokelumne River in the Sierra foothills; San Francisco pumps its water out of the Tuolumne River in Yosemite National Park; and Southern California imports water from the Colorado River and Northern California. The hub of California's vast plumbing system, though, is the Sacramento-San Joaquin River Delta, a maze of islands and waterways that is fed by ten of the state's largest rivers, provides drinking water to 25 million people, and supplies irrigation water for the fifth-largest agricultural industry in the world.

Each year, California pumps about 1.6 trillion gallons of freshwater out of the Delta. That water has been uniquely instrumental in spurring the



state's widespread economic and population growth over the past half-century. But the massive removal of freshwater also has pushed the largest estuary on the West Coast to the brink of environmental collapse. Native fish have been hit particularly hard: Two species have already gone extinct and another six are threatened or endangered. In recent years, environmental laws meant to protect these fish have also made water deliveries to the San Joaquin Valley and Southern California increasingly unreliable.

To solve these and other problems facing the Delta and California's all-important water supply, the state is planning to overhaul its water system. Currently, two competing proposals are under consideration. The primary one is called the Bay Delta Conservation Plan (BDCP). It's backed by Governor Jerry Brown and a handful of politically influential water districts that represent Big Agribusiness interests in the San Joaquin Valley and millions of Southern California residents.

The \$24.5 billion project involves building two giant underground tunnels that would divert huge amounts of freshwater from the Sacramento River north of the Delta to the south. The plan also enjoys considerable support in the state legislature, particularly from politicians who have received campaign donations from corporations and lobbyists that stand to benefit from a more reliable water supply. But BDCP has also drawn sharp criticism from some environmental organizations and numerous small farmers in the Delta.

The second plan is called the Portfolios Alternatives, and it's backed by a diverse group of urban water districts (including East Bay MUD and the Contra Costa Water District), environmentalists, liberal politicians, and several business groups. It's designed to be an environmentally friendly alternative to BDCP: It features one smaller water tunnel and offers a suite of other measures that represent a more conservation-oriented solution to California's water woes.

However, high-ranking state officials, including the governor, are by and large ignoring Portfolios, and it appears as though BDCP

will win approval in the state legislature. If it does, the impacts could be wide-ranging. The plan could devastate small farms in the Delta region, and by taking massive amounts of freshwater from the Sacramento River before it reaches the estuary, the plan could irrevocably harm the Delta's already compromised ecosystem.

In fact, it could end up being a conservation plan that ultimately destroys one of California's most important natural resources.

The first settlers to arrive in the Sacramento-San Joaquin River Delta region found an environment teeming with life. Migrating sandhill cranes, pelicans, and geese were so plentiful that when they took flight the sky darkened under their shadow; river channels turned reddish-brown as Chinook salmon and green sturgeon migrated up to the Sierra Nevada to spawn; and an abundance of vegetation, from cottonwood trees to tule, covered the hundreds of islands, natural levees, and meadows in the Delta. The life force of this thriving ecosystem was the brackish waters that formed when freshwater from the San Joaquin and Sacramento rivers encountered the salty San Francisco Bay.

This original ecosystem, however, no longer exists. In the mid 1800s, droves of prospectors came to California in search of gold, and the Delta became an important mid-point between the Sierra and San Francisco. Pioneers quickly noticed the rich peat soils — the by-product of thousands of years of decaying tule and other swamp vegetation — that covered the estuary. The settlers built levees, pumped out the lingering water, and began planting corn, wheat, alfalfa, fruit orchards, and a variety of other crops. Today, less than 5 percent of the Delta's original wetlands remain intact, and two-thirds of its land mass is devoted to agriculture. Such a drastic environmental shift has also allowed an alarming number of invasive plants and animals to colonize the area.

In the 1950s and '60s, the Delta's ecosystem was further compromised when California built one of the most elaborate hydraulic systems in history in order to send copious amounts of freshwater from the estuary to the San Joaquin Valley and Southern California. "Possibly, historically, you might have something beginning to get close to this in China, going back over a thousand years, but that's it," Bill Friedland, a retired sociology professor from UC Santa Cruz, told me a few years ago.

Near the city of Tracy, in the southeast corner of the Delta, lies the heart of California's modern-day water system: two massive pumps that capture freshwater and send it south in large canals and aqueducts. This system has transformed the arid southern Central Valley into a major agricultural region. It also spurred rapid population growth in Southern California during the past half-century.

The system has also caused native fish populations to plummet. Between 1930 and 1949 — before California's water system was built — 81 percent of the freshwater that came into the Delta flowed through San Francisco Bay to the Pacific Ocean, creating an abundance of brackish, and immensely fertile waters. By 1969, the outflow had dropped to 67 percent. And between 1998 and 2005, only 45 percent of the freshwater that flowed into the Delta exited into the Bay.

As a result, salinity levels in the Delta have increased more than sevenfold since the early 1900s. Some water channels even flow backwards now because of the lack of freshwater coming from rivers. "The fish have been in a continuous decline for the past thirty to forty years," noted Jeff Miller, a conservation advocate

for the Center for Biological Diversity, an environmental group that has fought to protect fish in the Delta and opposes BDCP. "In some cases, we've gone from tens of millions of fish to tens of thousands of fish."

In recent years, tens of millions of fish — most notably the pinky-sized Delta smelt, whose population numbers are an indicator of the well-being of the entire estuary — have also been sucked into the Tracy water pumps and shredded to death. In 2008, a federal judge ordered a 35 percent reduction in water diversions from the Delta to protect the fish. The decision sparked years of fierce litigation, with politically influential water districts pushing for weaker fish protections and environmentalists pushing back.

For the past several years, state officials, several water districts, and some environmental groups have been working on a solution to the Delta's environmental and water reliability problems, and last month the state released a preliminary draft of the Bay Delta Conservation Plan. The massive public works project includes two main components: The first is building two 40-foot-wide, 35-mile-long water

tunnels that would connect to the Sacramento River before it reaches the northern section of the Delta and would extend south to Tracy, where the existing pumps would push the water to the San Joaquin Valley and Southern California via the canals and aqueducts the state already uses.

The ratepayers of six major water districts — including the politically powerful Westlands Water District, which supplies water to Big Agribusiness in the San Joaquin Valley, and the Metropolitan Water District, which provides water to 19 million customers in Southern California — would pay for most of the construction costs. The entry point of the giant tunnels would be equipped with state-of-the-art fish screens, which would partially solve the problem of fish kills at the pumps in Tracy, and thereby make water deliveries more dependable.

The second portion of BDCP is a 120,000-acre wetlands restoration project, which would be completed during the next fifty years. The goal of this project is to create an abundance of shallow tidal wetlands that would increase the amount of natural habitat for endangered fish. According to California Fish and Wildlife Director Chuck Bonham, the

restoration project would be so big that it will potentially be “observable from space.” Unlike the water tunnels, this portion of the plan would be financed by \$4 billion in general obligation bonds paid by California taxpayers.

While both components of the proposal look appealing on paper, numerous environmental groups and small farmers in the Delta contend that BDCP is shortsighted and deceptive. The habitat restoration project, for example, would forcefully retire thousands of acres of farmland in the Delta and could eventually devastate the region’s agricultural economy. The twin tunnels would be able to divert significantly more water away from the estuary than is currently possible and thus could deteriorate water quality. And there is no solid evidence that increasing the amount of tidal wetlands would benefit certain threatened fish.

In fact, at least one top official in the Brown administration has admitted that the BDCP plan will not save the Delta. “BDCP is not about, and has never been about, saving the Delta,” Jerry Meral, deputy secretary at the California Natural Resources Agency, told Tom Stokely, a longtime water advocate, earlier this year, according to several news

reports. “The Delta cannot be saved.”

Meral’s comments confirmed what many critics of BDCP have contended for years — that the plan is really only about making sure that Big Ag in the San Joaquin Valley and residents of Southern California get plenty of freshwater.

“The Delta is the target of this plan,” argued Russell Van Loben-Sels, whose family has farmed the Delta for more than a century. “Other areas will benefit from water reliability, but we stand to lose, both in the extent of our agricultural industry, and in water quality and quantity.”

Crossing the Paintersville Bridge, which connects the city of Sacramento to the northern Delta, is like crossing into a different time period. “We really haven’t changed all that much since I was a kid,” said Loben-Sels. “Our towns are pretty much the same. Our bridges are the same. Most of the houses are still the same.”

Loben-Sels’ family was among a wave of European farmers who came to the Delta during the late 1800s. “The first order of business was building levees, and that’s what they did for 20 or 25 years,” he said. Farmers drained what

was in essence a lake within the northern Delta’s Pearson District, and planted row after row of pears, barley, and wheat. Nearly a century and a half later, Loben-Sels continues to operate a 2,500-acre farm on the very same land his great-grandfather once plowed. “At the higher grounds, up against the levee, we grow wine grapes, pears, some apples, kiwis, and cherries,” he explained. “In the lower lands we grow a lot of corn, wheat, and safflower.”

Most farmers in the Delta are like Loben-Sels: They operate on a fairly small scale (although most are much smaller than 2,500 acres), and they have roots that extend back generations. Many also embrace sustainable farming practices, plant wildlife-friendly crops, and grow organic food.

Nonetheless, this unique farming community faces an uncertain future. In parts of the southern and western Delta, it is not uncommon for farmland to be 10 to 25 feet below sea level, which is due to a natural oxidation process that occurs in peat soil, and is aggravated by some agricultural practices. This subsidence creates a disorienting sight near levees, where rushing rivers often flow at elevation levels higher than nearby farms and grazing

land. When levees breach, water rushes in and inundates the surrounding area with little warning.

Such catastrophic scenarios may become common in the future: a combination of rising sea level and sinking land is putting an increasing amount of water pressure on the Delta's aging levee system. As a result, more than half of the Delta's islands have a 90 percent chance of failing some time in the next fifty years unless they're fixed, according to a 2010 report issued by the Public Policy Institute of California. "[T]he Delta of the future — with large bodies of open water — will significantly differ from the Delta of yesterday or today," the report concluded.

In 2006, after Hurricane Katrina, California received federal grants and approved hundreds of millions of dollars in state bonds to repair the Delta's levees. However, many experts believe that this endeavor is a Sisyphean task: There are more than 1,000 miles of levees in the Delta, and many are more than a century old and in poor shape. In reference to the Public Policy Institute report, Nancy Vogel, a representative for the California Department of Water Resources, a main backer of BDCP, said: "It's just

going to get more and more expensive to try and maintain the levees. ... And sometimes if a levee breaks, society as a whole needs to ask, 'Hey, is it really worth it to repair that?'"

Vogel noted that levee repairs fall outside of BDCP's goals and objectives. As part of BDCP, state officials instead would transition tens of thousands of at-risk farmland into tidal wetlands in the hopes that the Delta's six endangered or threatened fish species — the Delta smelt, green sturgeon, Sacramento splittail, Longfin smelt, Steelhead trout, and Chinook salmon — will rebound. "We're going to meet the most progressive parts of the US and California Endangered Species act[s] — the parts that say try and protect a multitude of species, over a large area, all at once, and comprehensively over time," said Vogel.

Some past restoration projects, such as the intentional flooding of Liberty Island in the North Delta, have become strongholds for green sturgeon and Delta smelt. However, the state has yet to properly analyze these efforts — despite numerous requests from the US Fish and Wildlife Service and the National Marine Fisheries Service to do so. As a result, it's uncertain whether habitat restoration would

benefit some native fish in the Delta. "The assumption is that if you restore tidal marshes, it will increase the amount of nutrients in the [estuary], which will eventually work its way up the food chain and reach the targeted fish," said Peter Moyle, a professor and former chair of the Department of Wildlife, Fish and Conservation Biology at UC Davis. However, Moyle noted that the Delta's ecosystem is so compromised that invasive species may also gain from BDCP's habitat restorations. "We know that tidal restoration will be good for a lot of things, but it may or may not be good for these fish."

Some scientists also note that some native fish may not benefit at all from the restoration project — including the Longfin smelt. "What's threatening the Longfin smelt is a lack of freshwater flow, and the idea that the habitat restoration will benefit them is pure speculation and highly unlikely," said Jon Rosenfield, a conservation biologist with the Bay Institute, an environmental group that is working to improve BDCP. State and federal fish agencies are also concerned that the project will end up being significantly smaller than 120,000 acres.

There is no question, however, that the forceful retirement of farmland will decimate many small farmers in the Delta. “If they go into the core area, where we grow our high value crops, it could devastate our agricultural infrastructure,” said Loben-Sels.

If that were to happen, the Delta farming communities would face economic ruin. “I think it’s important for the Delta to change over time, not to have someone say, ‘You’re not sustainable anymore, so we’re going to destroy you,’” said Loben-Sels. “That would be like saying to San Francisco, ‘You have a big earthquake problem, so we’re not going to allow you to develop anymore in the city.’”

A century ago, the Sacramento River was one of the most powerful rivers in the West. It originated near Mount Shasta, in the Cascade Mountain range, but its watershed reached as far north as central Oregon. On its 320-mile journey to the Pacific, the river was fed by numerous tributaries and streams, and was home to robust runs of Chinook salmon.

The San Joaquin River was nearly as grand. High up in the Sierra Nevada, it began as a trickle, and rapidly gained volume as it flowed into the

Central Valley. There, it merged with the Merced, Tuolumne, Mokelumne, and Stanislaus rivers. This confluence of water once created giant marshes that attracted untold numbers of fish that would swim upstream into the mountains and back out to sea.

These powerful rivers once made the Delta a predominantly fresh body of water: Records from the early 1900s kept by the C&H sugar factory show that freshwater could often be drawn from as far west as the Suisun Bay, near the Carquinez Strait, which separates the East Bay from the North Bay.

However, during the past century, the state erected numerous dams on the rivers and their tributaries, so as to divert freshwater to farms and cities. In turn, water diversions have continuously increased since the 1950s. In 2011 alone, the state removed more than 6.3 million acre-feet of freshwater from the Delta and sent it south — the equivalent of about 2 trillion gallons. Between January 2012 and May of this year, the Tracy pumps sucked 5.3 million acre-feet of freshwater out of the Delta.

The San Joaquin River currently carries just a little more than 30 percent of its natural flow

of water. In some years, the state diverts 90 percent of its water (sixty-mile stretches of the river have run dry at times). As for the Sacramento River, it carries about 70 percent of its natural flow of water to the Delta on average.

The removal of all that freshwater — both from rivers before they reach the Delta and from the Delta itself — has allowed saltwater from San Francisco Bay to dominate parts of the region. Large volumes of saltwater now often extend as far inland as Antioch, some twenty miles east of the old salt line near the Carquinez Strait.

The saltwater intrusion has been especially bad for fish: It has reduced the freshwater habitats in the Delta, which many fish need to reproduce; it has decreased the amount of dissolved oxygen in the water, which fish need for survival; and it has made the Delta’s water less cloudy with sediment, which has exposed smelt and other threatened fish to predators. All of these factors have led to sharp declines in fish populations and a multitude of environmental problems.

The ecological damage caused by large water exports is most evident on the San Joaquin River. In 2010, the state water

board commissioned a wide-ranging study and found that, in order to protect fisheries and southern Delta farmers, 60 percent of the San Joaquin River would need to flow into the estuary. However, after factoring in the needs of San Joaquin Valley agriculture and Southern California water users, the water board dropped that number to 35 percent. The San Joaquin River, in other words, is one of the most endangered rivers in the nation. "It is just a cesspool, it's horribly overdeveloped," said Rosenfeld of the Bay Institute, referring to the San Joaquin and the huge amounts of water the state takes out of it. "And, as a result, the southern Delta is also a cesspool."

The Sacramento River still has pretty powerful flows, though, making water quality not as big of an issue in the North Delta. But BDCP may change that. The two giant water tunnels are designed to divert up to 6.5 million acre-feet of water a year from the Sacramento River, and would have the capacity to eventually carry up to 11 million acre-feet annually. In addition, the state would continue to operate the Delta pumps in Tracy at about 50 percent of their capacity on average, and at 75 percent of capacity during dry years.

By removing so much freshwater from the Sacramento before it reaches the Delta, water quality could dramatically deteriorate in some parts of the estuary. "If we do the same thing to the Sacramento River that we've done to the San Joaquin, the balance in the Delta will start to salt up," said Loben-Sels. "The Sacramento River is what keeps us fresh."

In an April report, officials from the US Fish and Wildlife Service accused the state of not only skewing data to artificially boost the benefits of the 120,000-acre habitat restoration project, but also of glossing over the negative impacts of removing all that freshwater from the Sacramento River before it reaches the Delta. The basic takeaway from the report was that, while the most recent BDCP proposal is an improvement over past plans, weakened flows in the Sacramento River would likely result in "increased agricultural runoff, invasive aquatic vegetation, warmer temperatures, and increased algal productivity" — all of which would benefit invasive species over native ones.

The Sacramento River also is the most important contributor of sediment to the Bay-Delta region, especially during heavy

rains and spring snowmelts when the river is carrying lots of freshwater. The twin tunnels, however, would divert this sediment-rich water during high flows. "Besides potentially negative effects on Delta smelt and Longfin smelt and their habitat ... clearer water would encourage growth of exotic aquatic plants ... in many areas of the North and West Delta," Fish and Wildlife wrote in its April report.

Sending more water through the tunnels during the summer and fall would also raise water temperatures in the Delta, limiting the available habitat for Delta smelt. "Even wet years would functionally become dry years for a third of Delta smelt's [one-year] life cycle," Fish and Wildlife wrote.

Ryan Wulff, a senior policy advisor for the National Oceanic and Atmospheric Administration Fisheries Service in the Central Valley, noted that BDCP has the potential to improve conditions for Chinook salmon, mainly because of the ability to place fish screens on new north Delta intakes. However, he also pointed out that, because BDCP hasn't nailed down specific flow levels, it's unclear how the giant tunnels might affect green sturgeon. "BDCP has made significant progress,

but we need to make sure that the biological goals, which are good, remain the foundation of the plan,” he said. “We also want to make sure we’re not trading the problems in the south [Delta] for new ones in the north [Delta].”

BDCP officials contend that the 120,000-acre habitat restoration project would offset any harm caused by the twin tunnels, but Fish and Wildlife called that conclusion “speculation” that does not reflect current scientific understanding. “The idea is that they’re going to restore habitats, inundate floodplains, take down some levees, let the water get back into the shallow marsh areas, and that will more than account for the massive diversion of water from the system,” said Rosenfield. “But it won’t. Plain and simple.”

State Department of Water Resources representative Vogel noted that BDCP is “a revocable permit, which we will lose if the fish population drops below a certain level.”

But the details of the permit haven’t been worked out yet, and due to the great uncertainty in BDCP, many believe that non-negotiable environmental protections should be written into the plan itself (which could happen during the permitting

process next year). “We don’t want to step into a fifty-year permit without knowing what we’re getting into,” Rosenfield said. “We need assurances that if something doesn’t go as planned, exporters won’t get more water.”

There are also concerns that the twin tunnels may increase how much water is pumped out of the Delta. Current environmental regulations limit water exports from the Delta to an average of about 4.8 million acre-feet a year. However, under BDCP, between 4.8 million acre-feet and 5.6 million acre feet could be pumped from the Sacramento River and the estuary — and even more in the future, if needed.

Still, Vogel expressed frustration toward accusations that BDCP is going to “‘drain the Delta dry.’ We could never do that, we have so many regulations we need to meet.”

State law, the US Clean Water Act, and the US Endangered Species Act ensure minimum outflows of freshwater into the Delta, and prevent the estuary from exceeding certain salinity levels. However, a handful of powerful water districts, Big Agribusiness, and their political allies, have been trying to gut these protections for years. And if they are successful,

then water exports out of the Delta may not only increase; they could skyrocket

Over the past half-century, several large and influential water districts have wielded considerable political power in Sacramento and are now driving the plan to build the giant water tunnels with Governor Brown. These water districts, which shower campaign contributions on elected officials and keep high-priced lobbyists on retainer, also have filed numerous lawsuits over the years in an ongoing effort to weaken environmental laws and regulations.

The most aggressive plaintiff has been the Westlands Water District, the largest irrigation district in the United States (by acreage, not members). Westlands provides irrigation water for western San Joaquin Valley factory farms and Big Agribusiness, and over the years it has used its influence to undermine environmental protections. “They’re the poster child for a water district that works purely in their own interest,” said Peter Gleick, executive director of the Oakland-based environmental think tank the Pacific Institute. “But sometimes their interests don’t align with broader social, environmental, or state interests.”

Westlands irrigates hundreds of thousands of acres of harsh desert in the western San Joaquin Valley. The region sits in the rain shadow of the coastal range, and sees a meager eight inches of precipitation on average each year. Very few rivers or streams flow into the region, and its alkaline soil is plagued by poor drainage, which has caused high levels of toxic selenium to accumulate over the years. The water district also has sucked the underground aquifers dry. "It is really an area that should have never been farmed," said Richard Walker, an expert on California agriculture and a retired professor of geography at UC Berkeley.

But tens of millions of acre-feet of highly subsidized Delta water have turned this inhospitable land into a cash cow for Big Agribusiness. There are very few small farmers in the region, and today the western San Joaquin Valley is covered in high-value, water-intensive crops. "We have some of the highest yields of tomatoes ... some of the highest yields of almonds," boasted Jason Peltier, Westlands' chief deputy general manager. "In the fall and spring, Westlands alone grows nearly 100 percent of the lettuce in the US. We [offer] a tremendous value to our food supply."

In 1960, the state began pumping Northern California river water to the western San Joaquin Valley after Fresno Democratic Congressman Bernard Sisk — whose political campaigns were bankrolled by Westlands — promised to turn the dusty valley into a bastion of small-scale family farmers "sharing the productivity and the bounty of fertile lands blossoming with an ample supply of ... water," according to an exhaustive report on the history of Westlands written by longtime journalist Lloyd G. Carter and published by Golden Gate University's Environmental Law Journal.

The idyllic community that Sisk promised, however, never came to fruition. Instead, Westlands used its political influence over the years to make sure the region remained in the hands of large factory farms that employ poorly paid migrant workers. The region's growers also have pocketed more than \$1 billion in state and federal subsidies over the past few decades. Walker noted that it would not be possible to grow food in Westlands if it were not for the taxpayer handouts. He said a few years ago a colleague of his "looked at the value of the products Westlands grew, and the cost of growing them, and added in the real cost of water rather than the low rates they

pay, and it turned out they run in the red."

Westlands has guaranteed its plentiful supply of cheap water and maintained its political connections over the years by hiring a number of former state and federal officials as both lobbyists and staff members. Peltier, for example, was a lobbyist for large water interests before becoming the Interior Assistant Secretary for Water and Science under President George W. Bush. He was then hired by Westlands. The district also has bankrolled many pro-agribusiness politicians. "They are the tail that wags the water dog in California, and not in a good way," said Walker of UC Berkeley.

During the 2012 election, the California Westside Farmers Inc., a Super PAC representing Westlands growers, donated \$115,000 to mostly Republican House and Senate candidates. Westlands growers, who are mostly Republicans themselves, also contributed \$50,000 to Governor Brown's Proposition 30, even though it raised taxes on the wealthy. Environmentalists have contended that the donation was to ensure that Brown would continue to push for the giant water tunnels plan.

Westlands growers also have contributed heavily to Democratic US Senator Dianne Feinstein, who has advocated for more water for Big Ag, and to Central Valley Congressman Jim Costa, a Democrat who is one of Westlands most loyal supporters. In a 2012 Congressional hearing, Costa boasted: “No one has done more than yours truly to bring water to the San Joaquin Valley in the near term and the long term.”

However, despite its many political connections, Westlands still only has junior water rights to Delta water, making the district particularly vulnerable to water cutbacks during dry years. Over the past two decades, the district has received 67 percent of the water supply it is contracted to get, on average, and the district has received much less than that during droughts. “We cannot live in a world that has 40-, 60-, 90-percent reductions in water supply on a regular basis,” said Peltier.

In an effort to secure more water, Westlands has sued repeatedly to roll back state and federal environmental protections in the Delta. In 2008, the US Fish and Wildlife Service submitted a formal biological opinion concerning the Delta smelt. It found that

dwindling freshwater flows paired with massive kills at the pumps in Tracy were pushing the pelagic fish to the edge of extinction. In turn, federal Judge Oliver Wanger demanded a 35 percent cut to water exports from the Delta.

That same year, Westlands and the San Luis Delta-Mendota Water Authority filed a lawsuit, alleging that the biological opinion was based on specious science. Judge Wanger sided with the water agencies and granted a preliminary injunction against water cuts. The ruling then led to a temporary increase in water deliveries.

In 2010, the US Fish and Wildlife submitted a rewritten opinion on the smelt, but once again Judge Wanger rejected it, contending that it did not adequately address the needs of water users. In the court hearing, he stated, “the public cannot afford sloppy science and unidirectional prescriptions that ignore California’s water needs.”

Kate Poole, a senior attorney with the Natural Resources Defense Council, an organization that has fought to protect native fish in the Delta, believes that Wanger’s decisions were too heavily influenced by non-environmental factors. “He

thought that these protections were having too big of an impact on water supply, and that colored his perception,” she said. After retiring from the bench in 2012, Judge Wanger briefly went to work as an attorney for Westlands, and was a keynote speaker at numerous Central Valley agribusiness conferences.

According to Peltier, Westlands will continue to fight the prominent belief among scientists that large water exports out of the Delta hurt native fish — even if BDCP is approved. “We will not accept certain social and economic losses and costs in the hope of benefitting the fish,” he said.

Such a stance has environmentalists concerned that if the twin tunnels get built, and if Westlands continues to undermine environment laws and protections, water districts would be able to pump significantly more water out of the estuary. “If you look at California’s history, water always flows towards money,” said Miller of the Center for Biological Diversity. “There are powerful corporate interests that have the power to get the water if we put the infrastructure in for them to divert it, and that’s exactly what’s going to happen despite any assurances the state’s making about how

[BDCP] is going to be run and governed.”

In the first week of May, the Sierra Club wrote a letter to Governor Brown, asking him to abandon BDCP. “You and your administration are relying too heavily on an old fashioned approach to resolving California’s water demand at a time when more updated ideas and alternatives are needed,” the organization wrote. “Your solution is to build something big before you leave office. Yet building something big and old-fashioned isn’t going to ensure — especially during a time of climate disruption — that the people of California and the environment will be guaranteed the reliable and essential water supply needed at a time it is most critical.” The Sierra Club also urged Brown to “explore alternative plans to lead California in a bolder, more enlightened and comprehensive direction on water supply.”

A diverse group of environmentalists, urban water districts, liberal politicians, and some business interests has proposed such an alternative to BDCP, referring to it as the “Portfolios” proposal. As the name suggests, the proposal tackles California’s water problems through a portfolio of investments, including building

new infrastructure, increasing conservation efforts, and boosting local water storage capacity and water supplies. If implemented, it would reduce the state’s dependence on the Delta and ensure a more reliable water system that is more adaptable to climate change. The alternative plan would also be billions of dollars cheaper than BDCP.

Portfolios still proposes building a peripheral tunnel in the northern Delta; however, it would be much smaller. Scaling back the water tunnel would save an estimated \$12 billion, which could then be invested in repairing Delta levees and improving local and regional water supplies.

Other noteworthy components of Portfolios include regenerating groundwater in the Central Valley and building water-recycling plants. Over the years, San Joaquin Valley farmers have sucked far too much water out of the ground, thereby harming overall water quality and making themselves ever more dependent on water deliveries from the Delta. One way to solve that problem is to pump more water back into the ground, also known as regenerating. It would allow farmers to take more water out of the Delta during wet years, when it is plentiful, and save

it underground for use during dry years.

Utilizing recycled wastewater for irrigation is another way to improve California’s water system. Some municipalities have invested in wastewater recycling plants, and have been able to dramatically reduce their water consumption. Santa Rosa, which recently built a water recycling plant, estimated that it saves more than 45 million gallons of potable drinking water per year. The city hopes to see that number grow to more than 500 million gallons annually in the next couple of decades. “It creates an assured supply of water that is not subject to cutbacks due to environmental problems, climate change, or an upstream diverter taking the water,” said Poole of the Natural Resources Defense Council, which co-authored Portfolios.

Portfolios would also invest in improving conservation and water-efficiency efforts and increasing stormwater capturing systems. “There’s a huge, undeveloped potential for all of this. ... And we think this would actually generate a bigger water supply than the [BDCP],” Poole said.

Until recently, most water agencies have been hesitant to revamp California's water infrastructure. After all, for much of the 20th century taking water out of the nearest river system was relatively cheap. However, over the past decade crashing fish populations and chronic drought have prompted severe cutbacks on nearly every major river system. "We really have to [cut] back on the Colorado River, the Delta, the Klamath [River]," said Poole.

And as water becomes scarcer, farmers and urban water users will have to pay more for it, which has prompted cities and water districts to seriously consider investing in new and local water supplies. But, Poole noted, "we need to provide the support, both financially and technically, to bring these new facilities on line," which Portfolios would do.

The plan also would also help restore the Delta's ecosystem. "It would take less water out of the estuary than we do today, it would increase flows during critical parts of the year, and it would use the existing south Delta pumps far less than the current BDCP proposal does," explained Poole.

While Portfolios is still only a conceptual plan and has yet

to be carefully analyzed, eight water agencies, including East Bay MUD and the Contra Costa Water District, support it — as do 39 members of Congress, state senators, Assembly members, mayors, and county supervisors, along with numerous environmental and business organizations. "There isn't any more water, unless you're really willing to kill the rest of the rivers in California," said Gleick, who supports the Portfolios approach.

He added that when you are up against such a physical limitation, "you have to do something different, and the first thing you have to do is look at waste and inefficiency. When you do that, the answer comes back that we can do far more with far less water. ... There are plenty of alternatives for meeting the state's needs for water more effectively, productively, and efficiently."

However, high-ranking federal and state officials are mostly opposed to Portfolios, including Governor Brown. They think it has been presented too late in the game, and stand firmly behind the Bay Delta Conservation Plan.

Although BDCP will be up for public review and comment in October, many think the

permitting process will drag on for years before any ground is broken, and that the cost of the project will balloon. "It will be very good for the legal profession," said Loben-Sels. "There will be legal battles about the flow levels, about how to keep the salt out, about the fish populations. ... Those of us who live [in the Delta] are not willing to concede until we see something reasonable coming from the other side. ... And BDCP is still stuck on these monster tunnels."