SAN JOAQUIN COUNTY
FLOOD CONTROL & WATER CONSERVATION DISTRICT
P. O. BOX 1810
STOCKTON, CALIFORNIA, 95201
TELEPHONE (209) 468-3000
FAX NO. (209) 468-2999

MICHAEL SELLING
DEPUTY DIRECTOR OF PUBLIC WORKS

ADVISORY WATER COMMISSION

October 21, 2015, 1:00 p.m.

Public Health Conference Room, 1601 E. Hazelton Avenue, Stockton, California

AGENDA

Roll Call

Approve Minutes for the Meeting of September 16, 2015

SCHEDULED ITEMS

I. Action Items:

A. No Action Items

II. Discussion Items:

A. Presentation and Discussion with State Drought Task Force Representatives – Bill Croyle, Drought Manager, California Department of Water Resources; Dee Dee D'Adamo, Board Member, California State Water Resources Control Board; Jeff Le, Assistant Cabinet Secretary, Office of Governor Edmond G. Brown, Jr.; Karen Ross, Secretary, California Department of Food and Agriculture.

III. Communications (See Attached):

A. September 21, 2015, The Sacramento Bee, "Two Major Water Agencies Consider Buying Delta Islands."

B. September 30, 2015, Delta Independent Science Board, "Review of Environmental Documents for California WaterFix."

C. October 9, 2015, Recordnet.com, "H2O Hackathon Seeks Solutions to Drought Issues."

D. October 12, 2015, Recordnet.com, "Hyacinth Forces Holiday Boat Parade Cancellation Again."

E. October 14, 2015, Update on Waters of the U.S., "U.S. Court of Appeals Delays WOTUS Rule Nationwide."

Next Regular Meeting: **November 18, 2015, 1:00 p.m.**
Public Health Conference Room

Commission may make recommendations to the Board of Supervisors on any listed item.

If you need disability-related modification or accommodation in order to participate in this meeting, please contact the Water Resource Staff at (209) 468-3089 at least 48 hours prior to the start of the meeting.Any materials related to items on this agenda distributed to the Commissioners less than 72 hours before the public meeting are available for public inspection at Public Works Dept. Offices located at the following address: 1810 East Hazelton Ave., Stockton, CA 95205. These materials are also available at http://www.sjwater.org. Upon request these materials may be made available in an alternative format to persons with disabilities.

REPORT FOR THE MEETING OF
THE ADVISORY WATER COMMISSION OF THE SAN JOAQUIN COUNTY
FLOOD CONTROL AND WATER CONSERVATION DISTRICT
September 16, 2015

The regular meeting of the Advisory Water Commission of the San Joaquin County Flood Control and Water Conservation District was held on Wednesday, September 16, 2015, beginning at 1:00 p.m., at Public Health Services, 1601 E. Hazelton Avenue, Stockton, California.

Roll Call

Present were Commissioners Nomellini, Holman, Jr., Winn, Holbrook, Alternate Heberle, Commissioners Salazar, Jr., Hartmann, Meyers, Secretary Nakagawa, Vice Chair Price, and Alternate Sanguinetti.

Others present are listed on the Attendance Sheet. The Commission had a quorum.

Approval of Minutes for the Meeting of July 15, 2015.
A motion to approve the minutes as amended for the meeting of July 15, 2015 was passed unanimously (Holbrook/Hartmann).

SCHEDULED ITEMS

Willard Price, Vice Chair of the Advisory Water Commission, led the agenda.

I. Action Items:

A. No action items

II. Discussion Items:

A. Update on Local Drought Emergency – Mike Cockrell

Mr. Cockrell presented information obtained from the National Weather Service and the National Oceanic and Atmospheric Administration (NOAA). He discussed El Niño as well as highlighted current actions taken by the County and others due to the drought. He explained that the latest forecast for this region indicates there is strong potential for El Niño to materialize, which could remain in effect until late spring 2016. This results in warmer than normal temperatures this winter, but the amount and frequency of rainfall in our area remains difficult to predict. The ocean-atmosphere interaction over the equatorial Pacific Ocean (changes in wind patterns, warmer waters, etc.) continues to influence the development of El Niño, but it is uncertain whether it will bring above average precipitation to various regions. This is a tough message to tell to the community. Historically, there have been six El Niño years, two of which were dry years. This, in turn, affects the longevity of the snow pack run-off. It is estimated that it will take several years of wet weather patterns and a strong snow pack to make up for the low water levels in reservoirs during this drought period.

Mr. Cockrell reported that the State encouraged some cities to improve water conservation efforts. However, it is expensive to enforce conservation mandates and the County seeks funds from the State

for this purpose. Well permits continue to be issued during the drought, but there are 59 fewer issued this year, compared to last. There have been 56,000 food boxes given to people out of work due to the drought. Environmental Health Department has indicated there are 23 dry well reports, nine of which are being monitored to see if this is a temporary or long-term condition. Due to persistent drought conditions, in October, the Board of Supervisors will be considering to continue the Proclamation of Drought Emergency, which was originally established January 2014. The County has currently spent about $500,000 on drought related activities.

Commissioner Winn asked if the capacity is known for capturing and storing future water. Mr. Cockrell answered there is available capacity, however, issues such as release requirements or environmental concerns may prevent significant water capture and storage from taking place.

Commissioner Winn inquired about OES flood preparation. Mr. Cockrell answered that there is a checklist of preseason measures to be taken. In addition, staff is ensuring supplies are on hand, contracts for emergency services are in place, and the alert systems are in proper working order. Commissioner Winn asked how the Butte fires will affect runoff conditions this winter. Mr. Cockrell stated debris run off is a concern. Mr. Nakagawa added that local reservoirs are far below early November storage level targets to meet the 100 year flood protection requirement. Mr. Nakagawa continued that as the County prepares for flood conditions each year, it plans for the 100 year storm. Therefore, the potential of El Niño is not going to change the flood planning that takes place. Commissioner Meyers asked if any efforts are being taken to store excess water underground. Mr. Nakagawa answered that in terms of groundwater management, the County is hopeful that reservoirs can be filled. However, before reservoirs can be filled the State must lift its curtailment order so that those who operate the reservoirs know it is permissible to store water behind the dams.

Mr. Moody commented on potential groundwater storage capacity in the Stockton East Water District (SEWD), stating that groundwater storage capacity is immediately available. However, utilizing this capacity would require an amendment in existing water rights.

B. Discussion on Valadao and Feinstein Drought Bills – Brandon Nakagawa

Mr. Nakagawa gave an update on Drought Bills from U.S. House Representative Valadao (H.R. 2898) and U.S. Senator Feinstein (S. 1894). Valadao's Drought Bill passed the House of Representatives and was sent to the Senate late July. The Feinstein Senate Drought Bill was released shortly thereafter and was supported by Senator Boxer. The President Obama Administration remains opposed to the Valadao Drought Bill and it is unclear at this time whether or not the Administration is opposed to the Feinstein Drought Bill. Lobbyists indicate there will be a workshop or hearing on both Bills mid-to late-October. There is discussion about broadening both Bills so that neither Bill may pass as they are currently written. Given both Bills continue to evolve, County staff is paying close attention to updates.

As discussed at the Advisory Water Commission meeting in July, it was decided to set a meeting with local stakeholders to identify specific parts of the Valadao Bill that could be embraced and those areas which continue to be opposed by the County community. Mr. Nakagawa stated that there was a lot of good discussion at the meeting regarding the opposition of the Bill and what the role of Congress should be. The meeting was held in August and Mr. Denham, a co-author of the Valadao Drought Bill, was not present. One of the main issues raised was predation and endangered species, such as black bass, striped bass, smelt, etc. Mr. Shields, South San Joaquin Irrigation District, also raised the concern for water storage capacity for use in future years.

Mr. Nakagawa provided some background on past statutes, such as HR 2828 of 2004, which legislatively removed certain protections, which contributes to the decline of the Delta and stated that this would be a topic for a future topic of discussion.

An interested party asked if anyone had information on the status of the Huffman's Bill. Mr. Nakagawa stated that to his knowledge, the Valadao and Feinstein Bills are the only Bills under consideration at this time. A follow-up question by the interested party was regarding an accelerated repayment feature within HR2898. Mr. Holbrook pointed out that within the footnotes it indicates that once a repayment of the contact is paid out, the contractor is no longer subject to the provisions of the Reclamation Reform Act of 1982.

Mr. Nakagawa stated there is a settlement agreement between the Federal government and Westlands Water District, which was a long-standing dispute over contract water. The details of the settlement are not available at this time.

C. Presentation on Upper Mormon Slough Erosion Repair Project – Matthew Ward

Mr. Ward presented the Upper Mormon Slough Erosion Repair Project, a joint effort between the San Joaquin Flood Control District and the Department of Water Resources (DWR). The Project is part of DWR's Flood System Repair Project (FSRP). The work at Mormon Slough is located 5 miles east of Linden, 15 miles south of Stockton, and just south of Highway 26. The channel has been eroding for approximately 15 years, which is causing Highway 26 to be endangered as well as creating issues with neighboring structures and land. San Joaquin County is the Local Maintaining Agency (LMA) for this levee and channel. Based on DWR's assessment in 2013, this area of the Mormon Slough Channel was ranked as critical, which entitles the repair work for FSRP funding, under Prop 84 and Prop 1E Water Bond Acts. The County formally communicated interest in this project to DWR by issuing a letter of intent. The cost of the project is about $5.5 million. There is a cost-share component which is part of the criteria to obtain the funding from DWR. DWR will pay up to 90% of the project. Commissioner Nomellini cautioned to be sure that the 90% funding covered by DWR will cover environmental costs, because, as Commissioner Nomellini explained, it is not uncommon for environmental costs to be excluded. The County's Bridge Division is also planning work to be done in the same area as the Mormon Slough project. There are overlapping areas between the Mormon Slough Erosion Repair Project and the project which is to be done by the County Bridge Division. The cost savings achieved due to the overlapping portion of the two projects will offset the $550,000 cost-share obligation of the Mormon Slough project. Therefore, there are no anticipated out-of-pocket expenses for the Mormon Slough Erosion Repair Project.

Commissioner Hartmann asked if the money has already been committed by DWR. Mr. Nakagawa stated that at this point this project is on a list which ensures the Mormon Slough Erosion Repair Project will receive State funding. A draft agreement has been received, but the project agreement has not been signed. The County will pay for the initial costs, and seek reimbursement for expenses. Commissioner Hartmann advised Mr. Ward to double check on the percentage of reimbursement.

Construction is scheduled to begin in 2017. The next steps are for the County and DWR to approve the project agreement. After approval of the project agreement, DWR will process the funding agreement.

D. Update on Federal Rule Making Process Defining Waters of the U.S. – Brandon Nakagawa

Mr. Nakagawa stated that there has been a lot of discussion regarding the definition of the Waters of the U.S. (WOTUS). This topic has been a priority on County's adopted legislative platform for a number of years. There has been some discussion that the U.S. Presidential Administration may want to re-write the rules on governing the definition of WOTUS. This is important because it affects the EPA's jurisdiction on requiring permits, surveys and also imposes limitations on the use of private property as well as whether public agencies can perform certain repair work. The County has had a long record of opposing any expansion of the jurisdiction. The Army Corps of Engineers and Environmental Protection Agency released a new rule, which clearly expands the definition of the Waters of the U.S. The County has submitted a letter of opposition. Mr. Nakagawa wanted to ensure local agencies are aware WOTUS and its significant implications. There is a rumor that the South Pacific Division of the Army Corps of Engineers has been enforcing the new rule for the last year, which is ahead of August 28th date in which the rule was intended to be enforced.

Commissioner Sanguinetti asked whether California came under the same ruling. Mr. Nakagawa explained that thirteen states were successful in blocking implementation of the ruling; however, California was not one of them. It is anticipated that the ruling will apply to the 37 states which were not part of that case, but the ruling continues to be clarified. Ms. Julianne Phillips, Farm Bureau Federation, stated that the expansion of the Waters of the United States Act has significant impacts to growers in this County. The Act will impact day-to-day activities if the Board deems the activity as jurisdictional. Such day-to-day activities may include planting a vineyard or building a fence, which would require the grower to obtain a permit. If determined that a grower had not been compliant, the fee would be $37,500 per day. It is estimated that between 82% and 88% of farm land will fall into the region covered by this Act, although there remains confusion as to exactly which properties will fall under the Act.

Ms. Phillips stated that at this point the Act is a rule in the State of California. There remain two options available to Congress to prevent it from becoming fully enforced: 1) repeal the Act; or 2) block the funding to enforce the Act. Mr. Nakagawa added that there is a Federal Senate Bill (S 1140), which could repeal the Rule and it is scheduled for committee hearings sometime October or November. Commissioner Meyers asked if the House of Representatives (House) is working on this. Mr. Nakagawa answered that the House is working on this matter, however the House does not have the required 2/3 majority votes.

Commissioner Winn added that many people have never heard of the Waters of the U.S. and it is important to be educating interested parties.

Commissioner Hartmann added that with the expansion and redefinition of federal authority over the Waters of U.S., the potential impacts are far-reaching. As an example, he stated, if a facility has water run-off when it rains which potentially drains to a waterway, the Waters of the Unites States action may be required. The impacts include: 1) the cost of compliance; 2) the determination of when one has to comply; and 3) the determination what has to be done to be in compliance.

E. Update on Sustainable Groundwater Management Act Work Group Formation by the GBA. – Brandon Nakagawa

Mr. Nakagawa provided an update on how local agencies in the County are reacting to the new Sustainable Groundwater Management Act (SGMA) of 2014. Prior to 2014, the County remained opposed to the accelerated legislative process, and instead sought to obtain more time to consider groundwater management. Now, efforts have shifted to understanding the legislation and establishing

a timeline to implement requirements under the Act. The SGMA legislation, as passed, identifies the type of entity eligible to become a Groundwater Sustainability Agency (GSA), associated powers, and the timeline under which it is to be implemented to avoid State intervention and mandated milestones to be achieved in order to maintain compliance with the Act. A lot of leeway was given to DWR and the State Water Resources Control Board to interpret, draft regulations and enforce SGMA. DWR has been vague on many detailed requirements thus far. The entire San Joaquin groundwater basin must be covered by one or more GSAs. The Act allows for multiple GSAs, but does not permit GSAs to overlap areas within the basin. At its August 2015 meeting, the Eastern San Joaquin County Groundwater Basin Authority (GBA) formed the SGMA Work Group (WG) to provide a framework for and facilitate the process to establish GSAs, develop a Groundwater Sustainability Plan and coordinate the efforts of multiple agencies as the SGMA implementation process unfolds. The SGMA WG consists of potential GSA organizations or local public agencies. Twenty-one agencies were invited to join the SGMA WG. The SGMA process is expected to be lengthy, but must be aggressive to meet DWR-established milestones, which prevents State intervention. Discussions by the SGMA WG are needed to outline GSA eligibility criteria, the obligations of being a GSA as well as how to fund and coordinate the efforts within and adjacent to the County. The SGMA WG will also need to discuss basin boundaries and the potential for requesting any desired boundary changes to DWR.

Commissioner Winn stated that the SGMA WG meeting had very good representation and believed that a lot of good discussions are taking place.

III. Communications:

A. July 21, 2015, San Joaquin County Request to Extend Comment Period for BDCP Recirculated Draft EIR/EIS

B. July 29, 2015, Delta Counties Coalition Request to Extend Comment Period for DDCP Recirculated Draft EIR/EIS.

C. September 9, 2015 Friends of the River et al Comment Letter – BDCP Recirculated Draft EIR/EIS

Public Comment:

Next Regular Meeting: October 21, 2105, at 1:00 p.m.
Public Health Conference Room

Adjournment: 2:39

SAN JOAQUIN COUNTY
FLOOD CONTROL & WATER
CONSERVATION DISTRICT

ADVISORY WATER COMMISSION

MEETING OF SEPTEMBER 16, 2015

ATTENDANCE SHEET

NAME	AFFILIATION	E-MAIL ADDRESS	PHONE
Lynn Hoffman	SJC-PW-WR	mlhoffman@sjgov.org	468-3531
Kurtis Keller	N+B	kkeller@neumiller.com	948 8200
Emily Allen	Assemblyleader Olsen	emily.allen@asm.ca.gov	576-6425
Elise Sisson	N+B	esisson@neumiller.com	948-8200
Julianne Phillips	SJFB	jphillips@sjfb.org	931-4931
Jeff Shields	SSJID	JSHIELDS@SSJID.COM	652-2911
Michael Callahan	SJ County PW	mcallahan@sjgov.org	468-9360
Jane Wagner-Tyack	League of Women Voters	JaneTyack@mac.com	642-5105
[illegible]	SJC EHD	[illegible]@sjcehd.com	468 3420
Brent Williams	Stakeholder	same	
Alex Breitler	The Record	abreitler@recordnet.com	546-8295
Gerald Schwartz	CDMWA	gschwart@[illegible]	334 3048
Scot Moody	SEWD	SMOODY@SEWD.NET	948-0333
Regina Rubier	City of Stockton	REGINA.RUBIER@STOCKTONCA.GOV	937 8782
Barbara Hueckstaedt	SJ Agric Comm	bhueckstaedt@sjgov.org	953-6000
Matthew Ward	SJ County Public Works	MWard@sjgov.org	468-3060
Annette Henneberry Schermesser	At-Large alt	2mooncoin@att.net	839.0717
ELBERT Holman	City of STOCKTON	Elbert.Holman@Stockgov.com	423-3778
DOUG HEBERLE	W.I.D.	heberlewid@gmail.com	625-8438
CHUCK WINN	SJC	CWINN@SJGOV.ORG	209-468-3113
Dante John Nomellini	CDWA	ngmplcs@pacbell.net	209-465-5883
GEORGE HARTMANN	RD 2074 RD 2030	gvhlaw@gmail.com	209-956-9946
Paul M Sanguinetti	SEWD	sanguinetti.ranch@gmail.com	209-466-0672
Will Price	At Large		
Drew Meyers	RD1608	CDRUSJ9057@AOL.com	
John Holbrook	SSJID		
Joe Salazar	Fish & Wildlife Rep	JSalazar@LBBSLAW.com	601-8030

ATTACHMENT III.

WATER & DROUGHT SEPTEMBER 21, 2015

Two major water agencies consider buying Delta islands

HIGHLIGHTS

Environmentalists say 'water grab' could result from land deals

Districts – one in L.A., one in Fresno – have discussed four Delta islands

Owning land also could expedite tunnels project

A view of the Sacramento-San Joaquin Delta looking north at Bradford Island with Jersey Island in the foreground separated by the San Joaquin River. **Manny Crisosotomo** - Sacramento Bee file

BY DALE KASLER AND RYAN SABALOW
dkasler@sacbee.com

Two of California's largest and most aggressive water agencies have discussed buying four islands in the Sacramento-San Joaquin Delta, prompting accusations by environmentalists and Delta farmers that the land purchases could be used to engineer a south state water grab.

Westlands Water District and Metropolitan Water District of Southern California have considered buying a collection of islands known as the Delta Wetlands Properties, according to recent meeting agendas for the two agencies. However, a Westlands spokesman said Monday the big Fresno-area agricultural district doesn't expect to make a purchase offer.

Control of the islands could yield significant advantages as water agencies both south and north of the Delta continue to wrestle over limited water supplies in the

fourth year of drought. Buying the islands would not automatically give the new owners control of the associated water rights. But they could apply to the state for the right to take more water in wet years.

In normal years, enough water is pumped out of the Delta to serve 3 million acres of farmland and 25 million urban Southern Californians.

The four Delta islands, now used for farming, are controlled by Zurich American Corp., the U.S. subsidiary of a Swiss insurer. Zurich has been trying for 20 years to convert the islands into giant for-profit reservoirs that could be used to store and ship water to big customers south of the Delta.

Purchase of the islands also could play into ongoing negotiations over the Delta tunnels project, a controversial $16 billion plan to channel water from the north part of the Delta to existing pumping stations in the south. By purchasing the islands, Metropolitan and Westlands would eliminate the need for contentious eminent domain proceedings in that part of the project, said Craig Wilson, a former staff attorney with the State Water Resources Control Board.

The project, championed by Gov. Jerry Brown, has been touted as a way to improve the reliability of water deliveries to Metropolitan, Westlands and other agencies south of the Delta. The four islands are adjacent to the path of the proposed tunnels.

Michael George, the state's Delta watermaster, said one of the islands could be used to stockpile fill dirt unearthed by the twin 30-mile-long tunnels, at least temporarily. George said he wasn't aware of possible interest in the islands by Metropolitan and Westlands.

Wilson said Metropolitan and Westlands also could be interested in the islands simply for their access to generous amounts of water. The four islands come with riparian water rights that can be used only on the adjacent lands. But the two agencies could seek state approval to store that water during wet years, for later shipment south.

"It's a potential two-for-one for them," said Wilson, who previously served as the Delta watermaster, overseeing the enforcement of water rights in the 600,000-acre region. The four islands total 20,000 acres of land.

Metropolitan spokesman Bob Muir declined comment Monday. The agency's real property committee discussed the issue in closed session Tuesday, according to agenda materials. Muir said later in the day that no action was taken.

Westlands hasn't made any offer to acquire the properties "and I do not anticipate that the district will make such an offer," said Johnny Amaral, the district's deputy general manager of external

affairs, in an email to The Sacramento Bee. Agenda materials show that Westlands' water policy committee discussed the matter in closed session last week.

Barbara Barrigan-Parrilla, executive director of Restore the Delta, a coalition of environmentalists and Delta farmers, said it's not surprising that Metropolitan, with its deeper pockets, would be more interested than Westlands in trying to acquire the islands.

"This is a way for the Metropolitan Water District to get a foothold in the Delta for greater water supply," she said. Owning the islands, with its access to water, could be a great strategic advantage for Metropolitan whether the tunnels get built or not, she said.

Rick Stephens, asset manager for Martinez-based Delta Wetlands Properties, said he couldn't comment on the agenda items. He said the company is forging ahead with its plans for a storage project, but the land could be for sale once the permitting for that is done.

"We're working on our project," Stephens said. Asked about Metropolitan's interest, he said, "I don't know what's going on with them. You saw what I saw. You saw Met's agenda. I don't have any input on their agenda."

As currently conceived, the Delta Wetlands project revolves around two islands: Webb Tract and Bacon Island, located just seven miles from the pumping plants near Tracy that ship water to the San Joaquin Valley and Southern California. The two bowl-shaped islands, which sit below sea level, would be flooded during wet years and could store up to 215,000 acre-feet of water. That's 70 billion gallons.

"In dry years, it can be delivered where it is needed," reads a description of the project on Delta Wetlands' website. An influential Kern County water agency, the Semitropic Water Storage District, has worked with Delta Wetlands as a partner in the project.

Two other nearby islands, Bouldin Island and Holland Tract, would continue to be farmed but would also be used for habitat management to offset the impact of flooding Webb and Bacon, according to environmental documents on Delta Wetlands' website.

Dale Kasler: 916-321-1066, @dakasler

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980 NINTH STREET, SUITE 1500
SACRAMENTO, CALIFORNIA 95814
HTTP://DELTACOUNCIL.CA.GOV
(916) 445-5511

Delta Independent Science Board

September 30, 2015

To: Randy Fiorini, Chair, Delta Stewardship Council
Charlton Bonham, Director, California Department of Fish and Wildlife

From: Delta Independent Science Board

Subject: Review of environmental documents for California WaterFix

We have reviewed the partially Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement for the Bay Delta Conservation Plan/California WaterFix (herein, "the Current Draft"). We focused on how fully and effectively it considers and communicates the scientific foundations for assessing the environmental impacts of water conveyance alternatives. The review is attached and is summarized below.

The Current Draft contains a wealth of information but lacks completeness and clarity in applying science to far-reaching policy decisions. It defers essential material to the Final EIR/EIS and retains a number of deficiencies from the Bay Delta Conservation Plan Draft EIR/EIS. The missing content includes:

1. Details about the adaptive-management process, collaborative science, monitoring, and the resources that these efforts will require;
2. Due regard for several aspects of habitat restoration: landscape scale, timing, long-term monitoring, and the strategy of avoiding damage to existing wetlands;
3. Analyses of how levee failures would affect water operations and how the implemented project would affect the economics of levee maintenance;
4. Sufficient attention to linkages among species, landscapes, and management actions; effects of climate change on water resources; effects of the proposed project on San Joaquin Valley agriculture; and uncertainties and their consequences;
5. Informative summaries, in words, tables, and graphs, that compare the proposed alternatives and their principal environmental and economic impacts.

The effects of California WaterFix extend beyond water conveyance to habitat restoration and levee maintenance. These interdependent issues of statewide importance warrant an environmental impact assessment that is more complete, comprehensive, and comprehensible than the Current Draft.

Review by the Delta Independent Science Board of the

Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/ Supplemental Draft Environmental Impact Statement

September 30, 2015

Contents

EXPECTATIONS FOR IMPACT ASSESSMENT OF CALIFORNIA WATERFIX

The Sacramento – San Joaquin Delta presents interconnected issues of water, biological resources, habitat, and levees. Dealing with any one of these problem areas is most usefully considered in light of how it may affect and be affected by the others. The effects of any actions further interact with climate change, sea-level rise, and a host of social, political, and economic factors. The consequences are of statewide importance.

These circumstances demand that the California WaterFix EIR/EIS go beyond legal compliance. This EIR/EIS is more than just one of many required reports. Its paramount importance is illustrated by the legal mandate that singles it out as the BDCP document we must review.

It follows that the WaterFix EIR/EIS requires extraordinary completeness and clarity. This EIR/EIS must be uncommonly complete in assessing important environmental impacts, even if that means going beyond what is legally required or considering what some may deem speculative (below, p. 4). Further, the WaterFix EIR/EIS must be exceptionally clear about the scientific and comparative aspects of both environmental impacts and project performance (p. 9).

These reasonable expectations go largely unmet in the Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement Draft (herein, "the Current Draft"). We do not attempt to determine whether this report fulfills the letter of the law. But we find the Current Draft sufficiently incomplete and opaque to deter its evaluation and use by decision-makers, resource managers, scientists, and the broader public.

BACKGROUND OF THIS REVIEW

The Delta Reform Act of 2009, in §85320(c), directs the Delta Independent Science Board (Delta ISB) to review the environmental impact report of the Bay Delta Conservation Plan (BDCP) and to provide the review to the Delta Stewardship Council and the California Department of Fish and Wildlife. On May 14, 2014, we submitted our review of the BDCP's Draft Environmental Impact Report/Draft Environmental Impact Statement (herein, the "Previous Draft"), which had been posted for review on December 9, 2013. This review[1] contained three main parts: an extended summary, detailed responses to charge questions from the Delta Stewardship Council, and reviews of individual chapters. Although the Previous Draft considered vast amounts of scientific information and analyses to assess the myriad potential environmental impacts of the many proposed BDCP actions, we concluded that the science in the Previous Draft had significant gaps, given the scope and importance of the BDCP.

The proposed BDCP actions have now been partitioned into two separate efforts: water conveyance under California WaterFix[2] and habitat restoration under California EcoRestore[3]. Environmental documents in support of California WaterFix (the Current Draft) were made available for a 120-day comment period that began July 10, 2015. The Current Draft focuses on three new alternatives for conveying Sacramento River water through the Sacramento – San

[1] http://deltacouncil.ca.gov/sites/default/files/documents/files/Attachment-1-Final-BDCP-comments.pdf
[2] http://www.californiawaterfix.com/
[3] http://resources.ca.gov/ecorestore/

Joaquin Delta. One of them, Alternative 4A, is the preferred alternative, identified as California WaterFix.

The Delta Stewardship Council asked us to review the Current Draft and to provide our comments by the end of September 2015. We are doing so through this report and its summary, which can be found in the cover letter.

The review began in July 2015 with a preliminary briefing from Laura King-Moon of California Department of Water Resources (three Delta ISB members present). The Delta ISB next considered the Current Draft in a public meeting on August 13–14 (nine of the ten members present)[4]. The meeting included a briefing on California EcoRestore by David Okita of California Natural Resources Agency and a discussion of the Current Draft and California WaterFix with Cassandra Enos-Nobriga of California Department of Water Resources (DWR) and Steve Centerwall of ICF International.

The initial public draft of this review was based on our study of Sections 1-4 of the Current Draft and on checks of most resource chapters in its Appendix A. This public draft was the subject of a September 16 meeting that included further discussions with Cassandra Enos-Nobriga[5] and comments from Dan Ray of the Delta Stewardship Council staff. Additional comments on that initial draft were provided by DWR in a September 21 letter to the Delta ISB chair[6]. These discussions and comments helped clarify several issues, particularly on expectations of a WaterFix EIR/EIS.

This final version of the review begins with a summary in the cover letter. The body of the report continues first with a section on our understanding of major differences between the BDCP and California WaterFix. Next, after noting examples of improvement in the Current Draft, we describe our main concerns about the current impact assessments. These overlap with main concerns about the Previous Draft, which we revisit to consider how they are addressed in the Current Draft. Finally, we offer specific comments on several major Sections and Chapters.

DIFFERENCES BETWEEN THE BDCP AND CALIFORNIA WATERFIX

The project proposed in the Current Draft differs in significant respects from what was proposed as the BDCP in December 2013. Here we briefly state our understanding of some main differences and comment on their roles on this review:

- The time period for permitting incidental take under Section 7 of the federal Endangered Species Act (ESA) and Section 2081(b) of the California Endangered Species Act (CESA) is substantially less than the 50 years envisioned as part of a Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) in BDCP. As a result, the science associated with many impacts of climate change and sea-level rise may seem less relevant. The permitting period for the project proposed in the Current Draft remains in place unless environmental baseline conditions change substantially or other permit requirements are not met. Consequently, long-term effects of the proposed project remain important in terms of operations and expected benefits (p. 8).

[4] http://deltacouncil.ca.gov/docs/delta-isb-meeting-notice-meeting-notice-delta-isb/delta-independent-science-board-isb-august-13

[5] Written version at https://s3.amazonaws.com/californiawater/pdfs/63qnf_Delta_ISB_draft_statement_-_Enos_-_FINAL.pdf

[6] http://deltacouncil.ca.gov/docs/response-letter-dwr

- In this shortened time frame, responsibility for assessing WaterFix's effects on fish and wildlife would fall to resource agencies (National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife). Other impacts would be regulated by a variety of federal and state agencies (Current Draft Section 1).
- The proposed habitat restorations have been scaled back. The Current Draft incorporates elements of 11 Conservation Measures from BDCP to mitigate impacts of construction and operations. Most habitat restoration included in the Previous Draft has been shifted to California EcoRestore. Our review of the Previous Draft contained many comments on the timing of restoration, species interactions, ecological linkages of conservation areas, locations of restoration areas and the science supporting the efficiency and uncertainty of effective restoration. Some of these comments apply less to the Current Draft because of its narrower focus on water conveyance.
- There remains an expected reliance on cooperative science and adaptive management during and after construction.
- It is our understanding that the Current Draft was prepared under rules that disallow scientific methods beyond those used in the Previous Draft. The rules do allow new analyses, however. For example, we noticed evidence of further analyses of contaminants, application of existing methods (e.g. particle tracking) to additional species (e.g., some of the non-covered species), and occasional selection of one model in place of the combined results of two models (e.g., fish life cycle models SALMOD and SacEFT).

IMPROVEMENTS ON THE PREVIOUS DRAFT

A proposed revamping of water conveyance through the Sacramento-San Joaquin Delta involves a multitude of diverse impacts within and outside of the Delta. Unavoidably, the EIR/EIS for such a project will be complex and voluminous, and preparing it becomes a daunting task in its own right. The inherent challenges include highlighting, in a revised EIR/EIS, the most important of the changes.

The new Sections 1 through 4 go a long way toward meeting some of these challenges. Section 1 spells out the regulatory context by discussing laws and agencies that establish the context for the Current Draft. Section 2 summarizes how the Previous Draft was revised in response to project changes and public input. Section 3 describes how the preferred alternative in the Previous Draft (Alternative 4) has been changed. Section 4 presents an impressive amount of detailed information in assessing the sources of habitat loss for various species and discussing how restoration and protection can mitigate those losses. Generally comprehensive lists of "Resource Restoration and Performance Principles" are given for the biological resources that might be affected by construction or operations. For example, page 4.3.8-140 clearly describes a series of measures to be undertaken to minimize the take of sandhill cranes by transmission lines (although the effectiveness of these measures is yet to be determined).

Section 4 also contains improvements on collaborative science (4.1.2.4, mostly reiterated in ES.4.2). This part of the Current Draft draws on recent progress toward collaborative efforts in monitoring and synthesis in support of adaptive management in the Delta. The text identifies the main entities to be involved in an expected memorandum of agreement on a monitoring and adaptive-management program in support of the proposed project.

Appendix A describes revisions to the resource chapters of the Previous Draft. Track-changed versions of the chapters simplify the review process, although this was not done for the

key chapter on aquatic resources (p. 17). We noticed enhanced analyses of contaminants and application of methods such as particle tracking to additional species, including some of the non-covered taxa; a detailed treatment of *Microcystis* blooms and toxicity; more information about disinfection byproducts; improved discussion of vector control arising from construction and operational activities; and revised depiction of surficial geology. Potential exposure of biota to selenium and methylmercury is now considered in greater detail. Evaluations will be conducted for restoration sites on a site-specific basis; if high levels of contaminants cannot otherwise be addressed, alternative restoration sites will be considered (page 4.3.8-118). Incidentally, this is a good example of adaptive management, although it is not highlighted as such. Explanations were provided for why the nitrogen-to-phosphorus ratio was not specifically evaluated, why dissolved vs. total phosphorus was used in the assessment, and how upgrades to the Sacramento Regional Wastewater Treatment Plant would eventually affect phosphorus concentrations.

CURRENT CONCERNS

These and other strengths of the Current Draft are outweighed by several overarching weaknesses: overall incompleteness through deferral of content to the Final EIR/EIS (herein, "the Final Report"); specific incompleteness in treatment of adaptive management, habitat restoration, levees, and long-term effects; and inadequacies in presentation. Some of these concerns overlap with ones we raised in reviewing the Previous Draft (revisited below, beginning on p. 10).

Missing content

The Current Draft lacks key information, analyses, summaries, and comparisons. The missing content is needed for evaluation of the science that underpins the proposed project. Accordingly, the Current Draft fails to adequately inform weighty decisions about public policy. The missing content includes:

1. Details on adaptive management and collaborative science (below, p. 5).
2. Modeling how levee failures would affect operation of dual-conveyance systems (below, p. 7). Steve Centerwall told us on August 14 that modeling of the effects of levee failure would be presented in the Final Report.
3. Analysis of whether operation of the proposed conveyance would alter the economics of levee maintenance (below, p. 7).
4. Analyses of the effects of climate change on expected water exports from the Delta. "[A]n explanation and analysis describing potential scenarios for future SWP/CVP system operations and uncertainties [related to climate change] will be provided in the Final Report" (p. 1-35 of the Current Draft).
5. Potential impacts of climate change on system operations, even during the shortened time period emphasized in the Current Draft (below, p. 8 and 11).
6. Potential effects of changes in operations of the State Water Project (SWP) and Central Valley Project (CVP), or other changes in water availability, on agricultural practices in the San Joaquin Valley (p. 12).
7. Concise summaries integrated with informative graphics (below, p. 9 and 13). The Current Draft states that comparisons of alternatives will be summarized in the Final Report (p. 1-35).

While some of the missing content has been deferred to the Final Report (examples 2, 4, and 7), other gaps have been rationalized by deeming impacts "too speculative" for assessment.

CEQA guidance directs agencies to avoid speculation in preparing an EIR/EIS[7] . To speculate, however, is to have so little knowledge that a finding must be based on conjecture or guesswork. Ignorance to this degree does not apply to potential impacts of WaterFix on levee maintenance (example 3; see p. 7) or on San Joaquin Valley agriculture (example 6; p. 12).

Even if content now lacking would go beyond what is legally required for an EIR/EIS, providing such content could assist scientists, decision-makers, and the public in evaluating California WaterFix and Delta problems of statewide importance (above, p. 1).

Adaptive management

The guidelines for an EIR/EIS do not specifically call for an adaptive-management plan (or even for adaptive management). However, if the project is to be consistent with the Delta Plan (as legally mandated), adaptive management should be part of the design.

The Current Draft relies on adaptive management to address uncertainties in the proposed project, especially in relation to water operations. The development of the Current Draft from the Previous Draft is itself an exercise in adaptive management, using new information to revise a project during the planning stage. Yet adaptive management continues to be considered largely in terms of how it is to be organized (i.e., coordinated with other existing or proposed adaptive-management collaborations) rather than how it is to be done (i.e., the process of adaptive management). Adaptive management should be integral with planned actions and management—the Plan A rather than a Plan B to be added later if conditions warrant. The lack of a substantive treatment of adaptive management in the Current Draft indicates that it is not considered a high priority or the proposers have been unable to develop a substantive idea of how adaptive management would work for the project.

There is a very general and brief mention of the steps in the adaptive management process in Section 4 (p. 4.1-6 to 4.1-7), but nothing more about the process. We were not looking here for a primer on adaptive management. Rather, we expected to find serious consideration of barriers and constraints that have impeded implementation of adaptive management in the Delta and elsewhere (which are detailed in the Delta Plan), along with lessons learned on how adaptive management can be conducted overcome these problems.

The Current Draft contains general statements on how collaborative science and adaptive management under California WaterFix would be linked with the Delta Collaborative Science and Adaptive Management Program (CSAMP) and the Collaborative Adaptive Management Team (CAMT). These efforts, however, have taken place in the context of regulations and permits, such as biological opinions and biological assessments required under the Endangered Species Act. We did not find examples of how adaptive management would be applied to assessing—and finding ways to reduce—the environmental impacts of project construction and operations.

Project construction, mitigation, and operations provide many opportunities for adaptive management, both for the benefit of the project as well as for other Delta habitat and ecosystem initiatives, such as EcoRestore. To be effective in addressing unexpected outcomes and the need for mid-course corrections, an adaptive-management management team should evaluate a broad range of actions and their consequences from the beginning, as plans are being developed, to facilitate the early implementation and effectiveness of mitigation activities.

[7] https://s3.amazonaws.com/californiawater/pdfs/bo0lx_Delta_ISB_Draft_Statement_&_Response_Letter_-_Enos_-_FINAL.pdf

The Current Draft defers details on how adaptive management will be made to work: "An adaptive management and monitoring program will be implemented to develop additional scientific information during the course of project construction and operations to inform and improve conveyance facility operational limits and criteria" (p. ES-17). This is too late. If adaptive management and monitoring are central to California WaterFix, then details of how they will be done and resourced should be developed at the outset (now) so they can be better reviewed, improved, and integrated into related Delta activities. The details could include setting species-specific thresholds and timelines for action, creating a Delta Adaptive Management Team, and capitalizing on unplanned experiments such as the current drought[8]. Illustrative examples could use specific scenarios with target thresholds, decision points, and alternatives. The missing details also include commitments and funding needed for science-based adaptive management and restoration to be developed and, more importantly, to be effective.

The protracted development of the BDCP and its successors has provided ample time for an adaptive-management plan to be fleshed out. The Current Draft does little more than promise that collaborations will occur and that adaptive management will be implemented. This level of assurance contrasts with the central role of adaptive management in the Delta Plan and with the need to manage adaptively as climate continues to change and new contingencies arise.

Restoration as mitigation

Restoration projects should not be planned and implemented as single, stand-alone projects but must be considered in a broader, landscape context. We highlighted the landscape scale in our review of the Previous Draft and also in an earlier review of habitat restoration in the Delta[9]. A landscape approach applies not just to projects that are part of EcoRestore, but also to projects envisioned as mitigation in the Current Draft, even though the amount of habitat restoration included (as mitigation) in the Current Draft has been greatly reduced. On August 13 and 14, representatives of WaterFix and EcoRestore acknowledged the importance of the landscape scale, but the Current Draft gives it little attention. Simply because the CEQA and NEPA guidelines do not specifically call for landscape-level analyses is not a sufficient reason to ignore them.

Wetland restoration is presented as a key element of mitigation of significant impacts (example below in comments on Chapter 12, which begin on p. 18). We noticed little attention to the sequence required for assessing potential impacts to wetlands: first, avoid wetland loss; second, if wetland loss cannot be avoided, minimize losses; and third, if avoidance or minimization of wetland loss is not feasible, compensate. Much of the emphasis in the Current Draft is on the third element. Sequencing apparently will be addressed as part of the permitting process with the US Army Corps of Engineers (USACE) for mitigation related to the discharge of dredged or fill material.[10] However, it is difficult to evaluate the impacts on wetlands in advance of a clarification of sequencing and criteria for feasibility.

Mitigation ratios

Restoring a former wetland or a highly degraded wetland is preferable to creating wetlands from uplands[11]. When an existing wetland is restored, however, there is no net gain of

[8] http://deltacouncil.ca.gov/docs/adaptive-management-report-v-8
[9] http://deltacouncil.ca.gov/sites/default/files/documents/files/HABITAT%20RESTORATION%20REVIEW%20FINAL.pdf
[10] Letter from Cassandra Enos-Nobriga, DWR, September 21, 2015.
[11] http://www.nap.edu/openbook.php?isbn=0309074320

area, so it is unclear whether credits for improving existing wetlands would be considered equivalent to creating wetlands where they did not recently exist.

In view of inevitable shortcomings and time delays in wetland restorations, mitigation ratios should exceed 1:1 for enhancement of existing wetlands. The ratios should be presented, rather than making vague commitments such as "restore or create 37 acres of tidal wetland…." The Final Draft also needs to clarify how much of the wetland restoration is out-of-kind and how much is in-kind replacement of losses. It should examine whether enough tidal area exists of similar tidal amplitude for in-kind replacement of tidal wetlands, and whether such areas will exist with future sea-level rise. We agree that out-of-kind mitigation can be preferable to in-kind when the trade-offs are known and quantified and mitigation is conducted within a watershed context, as described in USACE's 2010 guidance for compensatory wetland mitigation.[12] Since then, many science-based approaches have been developed to aid decision-making at watershed scales, including the 2014 Watershed Approach Handbook produced by the Environmental Law Institute and The Nature Conservancy[13].

Restoration timing and funding

To reduce uncertainty about outcomes, allow for beneficial and economical adaptive management, and allow investigators to clarify benefits before the full impacts occur, mitigation actions should be initiated as early as possible. Mitigation banks are mentioned, but are any operational or planned for operation soon? The potential for landowners to develop mitigation banks could be encouraged so restoration could begin immediately, engendering better use of local knowledge, financial profit, and local support for the project. We are told that the timing of mitigation will be coordinated with other review processes that are currently ongoing.[6]

Levees

A comprehensive assessment of environmental impacts should relate California WaterFix to levee failure by examining the consequences each may have for the other. The interplay between conveyance and levees is receiving additional attention through the Delta Levee Investment Strategy.

On the one hand, the Current Draft fails to consider how levee failures would affect the short-term and long-term water operations spelled out in Table 4.1-2. A rough estimate was proposed under the Delta Risk Management Study[14] and another is part of a cost-benefit analysis for the BDCP[15]. The Final Report should provide analyses that incorporate these estimates.

On the other hand, the Current Draft also fails to consider how implementing the project would affect the basis for setting the State's priorities in supporting Delta levee maintenance. This potential impact is illustrated by a recent scoring system of levee-project proposals that awards points for expected benefits to "export water supply reliability"[16]. Further efforts to quantify these benefits have been recommended as part of a comprehensive risk assessment that

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[12] http://www.sac.usace.army.mil/Portals/43/docs/regulatory/Guidelines_for_Preparing_a_Compensatory_Mitigation_Planf.pdf

[13] https://www.eli.org/sites/default/files/eli-pubs/watershed-approach-handbook-improving-outcomes-and-increasing-benefits-associated-wetland-and-stream_0.pdf

[14] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Delta_Seismic_Risk_Report.pdf

[15] http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Draft_BDCP_Statewide_Economic_Impact_Report_8513.sflb.ashx

[16] http://www.water.ca.gov/floodsafe/fessro/docs/special_PSP14_final.pdf

would guide the Delta Levees Investment Strategy[17]. Public safety, a focus of the Delta Flood Emergency Management Plan,[18] is just one asset that levees protect. The Current Draft does not evaluate how the proposed project may affect estimates of the assets that the levees protect.

The Current Draft cites levee fragility mainly as a reason to build isolated conveyance for Sacramento River water (examples, p. 1-1, 1-7, 1-9). In a similar vein, the California WaterFix website states, "Aging dirt levees are all that protect most of California's water supplies from the affects [*sic*] of climate change. Rising sea levels, intense storms, and floods could all cause these levees to fail, which would contaminate our fresh water with salt, and disrupt water service to 25 million Californians"[19]. Neither the Previous Draft nor the Current Draft, however, provides a resource chapter about Delta levees. Such a chapter would be an excellent place to examine interacting impacts of conveyance and levees.

Long-term effects

With the shortened time period, several potential long-term impacts of or on the proposed project no longer receive attention. While these effects may not become problematic during the initial permit period, many are likely to affect project operations and their capacity to deliver benefits over the long operational life of the proposed conveyance facilities. In our view, consideration of these long-term effects should be part of the evaluation of the science foundation of the proposed project.

The No-Action alternative establishes the baseline for evaluating impacts and benefits of the proposed alternative(s). It is therefore important to consider carefully how the baseline is established, as this can determine whether particular consequences of the alternatives have costs or benefits. Climate change, for example, is considered under the No-Action alternative in the Current Draft, as is sea-level rise. Climate change is expected to reduce water availability for the proposed northern intakes, and both climate change and sea-level rise are expected to influence tidal energy and salinity intrusion within the Delta[20]. Changes in water temperature may influence the condition of fishes that are highly temperature-dependent in the current analyses. These environmental effects, in turn, are likely to influence environmental management and regulation; from the standpoint of water quality they may even yield environmental benefits if agricultural acreage decreases and agricultural impacts are reduced.

Rather than consider such effects, however, the Current Draft focuses on how the proposed project would affect "the Delta's resiliency and adaptability to expected climate change" (Current Draft section 4.3.25). Quite apart from the fact that "resiliency" and "adaptability" are scarcely operational terms, the failure to consider how climate change and sea-level rise could affect the outcomes of the proposed project is a concern that carries over from our 2014 review and is accentuated by the current drought (below, p. 11).

The Current Draft states that "Groundwater resources are not anticipated to be substantially affected in the Delta Region under the No Action Alternative (ELT) because surface water inflows to this area are sufficient to satisfy most of the agricultural, industrial, and municipal water supply needs" (p. 4.2-16). This conclusion is built on questionable assumptions; the current drought illustrates how agriculture turns to groundwater when surface-water availability diminishes. Groundwater regulation under the recently enacted Sustainable

[17] http://deltacouncil.ca.gov/docs/delta-levee-investment-strategy/dlis-peer-review-technical-memorandum-31
[18] http://www.water.ca.gov/floodmgmt/hafoo/fob/dreprrp/InterdepartmentalDraftDFEMP-2014.pdf.
[19] http://www.californiawaterfix.com/problem
[20] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0024465

Groundwater Management Act (SGMA) can also be expected to have long-term effects on the proposed project—effects that the Current Draft does not assess. Ending of more than a million acre-feet of overdraft in the southern Central Valley under the SGMA is likely to increase demand for water exports from the Delta in the coming decades. The Current Draft discusses the potential effects of the project on groundwater (for example, in Sections 4.3.3 and 5.2.2.3), but we found only two brief, descriptive mentions of SGMA in the 235 pages of Section 5. The implications of prolonged droughts (e.g., on levee integrity) and of the consequences of SGMA receive too little attention in the Current Draft.

The Current Draft suggests that unnamed "other programs" that are "separate from the proposed project" will use elements of the Previous Draft to implement long-term conservation efforts that are not part of California WaterFix (Current Draft, p. 1-3). The Final Report should provide assurances that such other programs will step in, and could go further in considering their long-term prospects.

Informative summaries and comparisons

According to guidance for project proponents, "Environmental impact statements shall be written in plain language and may use appropriate graphics so that decision-makers and the public can readily understand them" (Code of Federal Regulations, 40 CFR 1502.8). Far-reaching decisions should not hinge on environmental documents that few can grasp.

This guidance applies all the more to an EIR/EIS of the scope, complexity, and importance of the Current Draft. It demands excellent comparative descriptions of alternatives that are supported by readable tables and high-quality graphics, enumeration of major points, well-organized appendices, and integration of main figures with the text. For policy deliberations, the presentation of alternatives should include explicit comparisons of water supply deliveries and reliabilities as well as economic performance. For decision-makers, scientists, and the public, summaries of impacts should state underlying assumptions clearly and highlight major uncertainties. The Current Draft is inadequate in these regards.

The Previous Draft provided text-only summaries for just the two longest of its resource chapters (Chapters 11 and 12). A fragmentary comparison of alternatives was buried in a chapter on "Other CEQA/NEPA required sections" (part 3 of Chapter 31) but fell far short of what was needed. Both the Previous and Current Drafts have been accompanied by a variety of outreach products for broad audiences (e.g., the descriptive overview of the BDCP Draft EIR/EIS[21]). These products do little to compensate for the overall paucity of readable summaries and comparisons in the Previous and Current Drafts.

For over three years, the Delta ISB has been specifically requesting summaries and comparisons: first in June 2012[22], then in June 2013[23], and again in a review of the Previous Draft in May 2014 (footnote 1, p. 1). Appallingly, such summaries and comparisons remain absent in the Current Draft. The generally clear writing in Sections 1 through 4 shows that the preparers are capable of providing the requested summaries and comparisons. Prescriptions in CEQA and NEPA in no way exclude cogent summaries, clear comparisons, or informative graphics. And three years is more than enough time to have developed them.

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[21] Highlights+of+the+Draft+EIS-EIR+12-9-13.pdf

[22] http://deltacouncil.ca.gov/sites/default/files/documents/files/DISB_Letter_to_JMeral_and_DHoffman-Floerke_061212.pdf

[23] http://deltacouncil.ca.gov/sites/default/files/documents/files /DISB%20Comments%20on%20Draft%20BDCP%20Document.doc_.pdf

On August 14, 2015, representatives of California WaterFix assured us that this kind of content would eventually appear, but only in the Final Report. That will be far too late in the EIR/EIS process for content so critical to comprehending what is being proposed and its potential impacts.

PRIOR CONCERNS AND THEIR RELEVANCE TO THE CURRENT DRAFT

The Delta ISB review of May 14, 2014 emphasized eight broad areas of concern about the scientific basis for the Previous Draft. Each is summarized below, followed by a brief appraisal of how (or whether) the concern has been dealt with in the Current Draft. While the reduced scope of the proposed project has reduced the relevance of some issues, particularly habitat restoration and other conservation measures, other concerns persist.

Our persistent concerns include the treatment of uncertainty, the implementation of adaptive management, and the use of risk analysis. These topics receive little or no further attention in the Current Draft. We also found few revisions in response to points we raised previously about linkages among species, ecosystem components, or landscapes; the potential effects of climate change and sea-level rise; and the potential effects of changes in water availability on agricultural practices and the consequent effects on the Delta. Our previous comments about presentation also pertain.

Effectiveness of conservation actions

Our 2014 review found that many of the impact assessments hinged on optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration.

This is arguably less of a concern now, given the substantially shorter time frame of the revised project and narrower range of conservation actions designed for compensatory restoration. Nonetheless, the Current Draft retains unwarranted optimism, as on page 4.3.25-10: "By reducing stressors on the Delta ecosystem through predator control at the north Delta intakes and Clifton Court Forebay and installation of a nonphysical fish barrier at Georgiana Slough, Alternative 4A will contribute to the health of the ecosystem and of individual species populations making them stronger and more resilient to the potential variability and extremes caused by climate change." A scientific basis for this statement is lacking, and an adaptive or risk-based management framework is not offered for the likely event that such optimism is unfulfilled.

Is it feasible for even the reduced amounts of mitigation and restoration to be completed within the time period proposed? Perhaps yes. Is it feasible that these actions will mitigate impacts over the long term? This is more problematic. To be effective, mitigation actions should deal with both the immediate and long-term consequences of the project. The proposed permitting should allow for monitoring long enough to assess the effectiveness of habitat restoration measures, which will need to extend beyond the initial permitting period.

Uncertainty

The 2014 review found the BDCP encumbered by uncertainties that were considered inconsistently and incompletely. We commented previously that modeling was not used effectively enough in bracketing uncertainties or exploring how they may propagate or be addressed.

In the Current Draft, uncertainties and their consequences remain inadequately addressed, improvements notwithstanding. Uncertainties will now be dealt with by establishing "a robust program of collaborative science, monitoring, and adaptive management" (ES 4.2). No details about this program are provided, so there is no way to assess how (or whether) uncertainties will be dealt with effectively. Although sensitivity modeling was used to address the effects of changes in the footprint and other minor changes of the revised project, full model runs were not carried out to assess the overall effects of the specific changes. Consequently, modeling that would help to bracket ranges of uncertainties or (more importantly) assess propagation of uncertainties is still inadequate.

Many of our prior concerns about uncertainties pertained to impacts on fish. If those uncertainties have now been addressed in Chapter 11, they are difficult to evaluate because changes to that chapter have not been tracked in the public draft (below, p. 17).

There are also uncertainties with the data generated from model outputs, although values are often presented with no accompanying error estimates. This situation could be improved by presenting results from an ensemble of models and comparing the outputs.

Effects of climate change and sea-level rise on the proposed actions

Our 2014 review stated concerns that the Previous Draft underestimated effects of climate change and sea-level rise across the 50-year timeline of the BDCP. With the nominal duration shortened substantially, most of the projected impacts of climate change and sea-level rise may occur later. But climate-related issues remain.

First, the Current Draft is probably outdated in its information on climate change and sea-level rise. It relies on information used in modeling climate change and sea-level rise in the Previous Draft, in which the modeling was conducted several years before December 2013. The absence of the climate-change chapter (Chapter 29) in the Previous Draft from Appendix A in the Current Draft indicates that no changes were made. In fact, the approaches and assumptions in the Current Draft remained unchanged from the Previous Draft in order to ensure consistency and comparability across all the Alternatives, even though newer scientific information had become available.[6] Yet climatic extremes, in particular, are a topic of intense scientific study, illustrated by computer simulations of ecological futures[24] and findings about unprecedented drought[25]. The Current Draft does not demonstrate consideration of recently available climate science, and it defers to the Final Report analysis of future system operations under potential climate and sea-level conditions. In fact, the Current Draft generally neglects recent literature, suggesting a loose interpretation of "best available science."

Second, climate change and sea-level rise are now included in the No-Action Alternative, as they will transpire whether or not WaterFix moves forward. A changed future thus becomes the baseline against which Alternative 4A (and the others) are compared. Changes in outflow from the Delta due to seasonal effects of climate change and the need to meet fall X2 requirements are considered in Section 4.3.1. The difference in outcomes then depends on assumptions about the facility and operations of Alternative 4A and the other Alternatives. Sensitivity analyses indicate that the impacts of the different Alternatives are generally similar in comparison to the No Action Alternative under the range of climate projections considered.[6] Thus, "Delta exports would either remain similar or increase in wetter years and remain similar

[24] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0024465

[25] Cook, B.I., Ault, T.R., and Smerdon, J.E., 2015, Unprecedented 21st century drought risk in the American Southwest and Central Plains: *Science Advances*, v. 1, doi:10.1126/sciadv.1400082.

or decrease in the drier years under Alternative 4A as compared to the conditions without the project." (p. 4.3.1-4). Such an inconclusive conclusion reinforces the need to be able to adapt to different outcomes. Simply because the Alternatives are expected to relate similarly to a No Action Alternative that includes climate change does not mean that the Alternatives will be unaffected by climate change.

Interactions among species, landscapes, and the proposed actions

The Previous Draft acknowledged the complexities produced by webs of interactions, but it focused on individual species, particular places, or specific actions that were considered in isolation from other species, places, or actions. Potential predator-prey interactions and competition among covered and non-covered fish species were not fully recognized. Confounding interactions that may enhance or undermine the effectiveness of proposed actions were overlooked. In our 2014 review we recommended describing and evaluating the potential consequences of such interactions, particularly in Chapters 11 (Fish and aquatic resources) and 12 (Terrestrial resources).

The Current Draft recognizes that mitigation measures for one species or community type may have negative impacts on other species or communities, and mitigation plans may be adjusted accordingly. But the trade-offs do not seem to be analyzed or synthesized. This emphasizes the need for a broader landscape or ecosystem approach that comprehensively integrates these conflicting effects.

Effects on San Francisco Bay, levees, and south-of-Delta environments

In 2014 we pointed to three kinds of impacts that the Previous Draft overlooked: (1) effects on San Pablo Bay and San Francisco Bay in relation to Delta tides, salinity, and migratory fish; (2) effects of levee failures on the proposed BDCP actions and effects of isolated conveyance on incentives for levee investments; and (3) effects of increased water reliability on crops planted, fertilizers and pesticides used, and the quality of agricultural runoff. The Current Draft responds in part to point 1 (in 11.3.2.7) while neglecting point 2 (above, p. 7) and point 3.

On point 3: Although the Current Draft considers how the project might affect groundwater levels south of the Delta (7.14 to 7.18), it continues to neglect the environmental effects of water use south of (or within) the Delta. Section 4.3.26.4 describes how increased water-supply reliability could lead to increased agricultural production, especially during dry years. Elsewhere, a benefit-cost analysis performed by ICF and the Battle Group[26] calculated the economic benefits of increased water deliveries to agriculture in the Delta. The Current Draft does not fully consider the consequences of these assumptions, or of the projections that the project may enhance water-supply reliability but may or may not increase water deliveries to agriculture (depending on a host of factors). We have been told that to consider such possibilities would be "too speculative" and that such speculations are explicitly discouraged in an EIR/EIS. Yet such consequences bear directly on the feasibility and effectiveness of the project, and sufficient information is available to bracket a range of potential effects. Our previous concerns are undiminished.

The impacts of water deliveries south of the Delta extend to the question of how each intake capacity (3,000, 9,000, or 15,000 cfs) may affect population growth in Southern

[26] Hecht, J., and Sunding, D., Draft Bay Delta Conservation Plan statewide economic impact report, August 2013.

California. Section 4.4.1-9 treats the growth-enabling effects of alternative 2D lightly, saying that additional EIS review would be needed for future developments.

Implementing adaptive management

In the Previous Draft, details about adaptive management were to be left to a future management team. In our 2014 review we asked about situations where adaptive management may be inappropriate or impossible to use, contingency plans in case things do not work as planned, and specific thresholds for action.

Although most ecological restoration actions have been shifted to California EcoRestore (p. 5), we retain these and other concerns about adaptive management under California WaterFix. If the mitigation measures for terrestrial resources are implemented as described, for example, they should compensate for habitat losses and disturbance effects of the project. The test will be whether the measures will be undertaken as planned, be as effective as hoped, and continue long enough to fully mitigate effects. This is where adaptive management and having contingency plans in place becomes critically important. It is not apparent that the mitigation plans include these components.

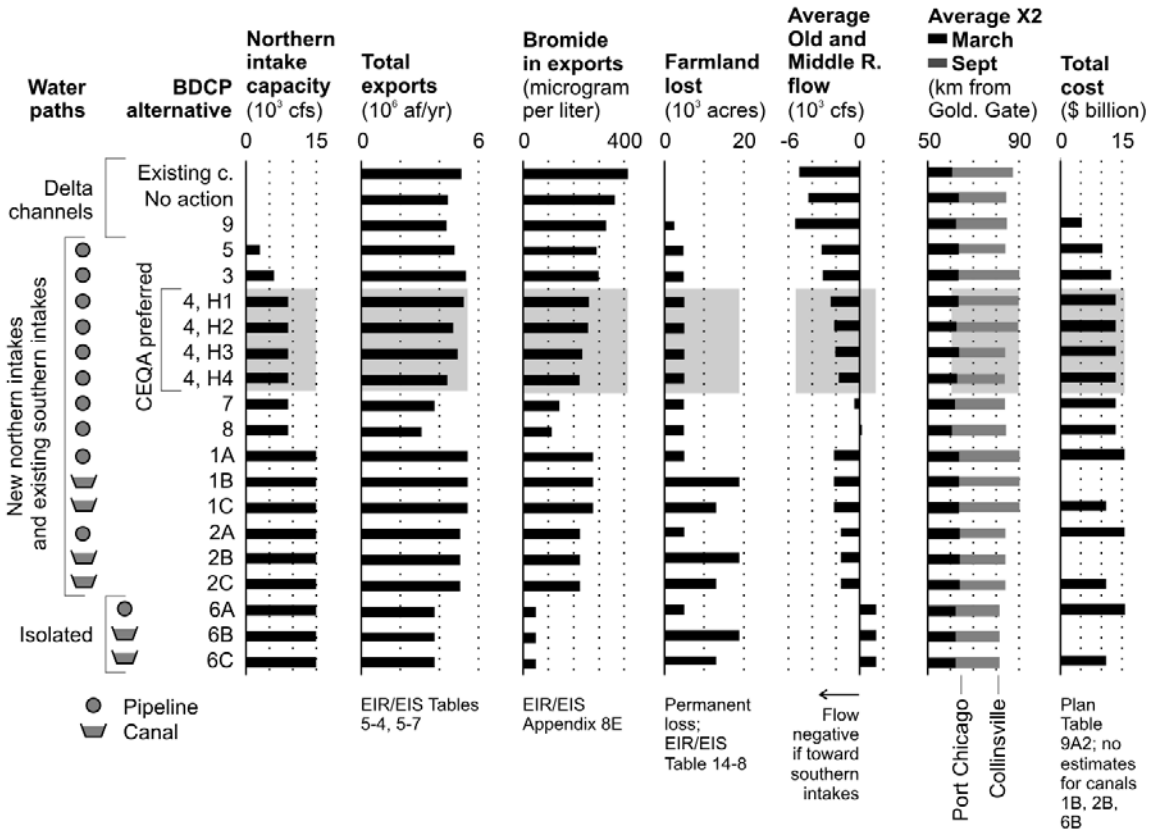
Reducing and managing risk

Our 2014 review advised using risk assessment and decision theory in evaluating the proposed BDCP actions and in preparing contingency plans. We noticed little improvement on this issue, just a mention that it might be considered later. This is not how the process should be used.

Comparing BDCP alternatives

The Previous Draft contained few examples of concise text and supporting graphics that compare alternatives and evaluate critical underlying assumptions. Rudimentary comparisons of alternatives were almost entirely absent. The Current Draft retains this fundamental inadequacy (p. 9).

Our 2014 review urged development and integration of graphics that offer informative summaries at a glance. We offered the example reproduced below. If the Current Draft contains such graphics, they would need to be ferreted out from long lists of individual pdf files. Because they are not integrated into the text where they are referenced in the Current Draft, the figures cannot readily illustrate key points.



COMMENTS ON INDIVIDUAL SECTIONS AND CHAPTERS

This final section of the review contains minimally edited comments on specific points or concerns. These comments are organized by Section or Chapter in the Current Draft. Many are indexed to pages in the section or chapter named in the heading.

Alternatives 4A, 2D, and 5A (Section 4)

It is good that the proposed alternatives are seen as flexible proposals, as it is difficult to imagine that any proposal for such a complex and evolving system could be implemented precisely as proposed. Some initial and ongoing modifications seem desirable, and unavoidable.

The operating guidance for the new alternatives seems isolated from the many other water management and environmental activities in and upstream of the Delta likely to be important for managing environmental and water supply resources related to Delta diversions. While it is difficult to specify detailed operations for such a complex system, more details on the governance of operations (such as the Real Time Operations process) would be useful. The operational details offered seem to have unrealistic and inflexible specificity. Presentations of delivery-reliability for different alternatives remain absent. Environmental regulations on Delta diversions have tended to change significantly and abruptly in recent decades, and seem likely to change in the future. How sensitive are project water supply and environmental performance to changes in operating criteria?

The collaborative science ideas seem philosophically attractive, but are not given much substance. Monitoring is mentioned, but details of organization, intent, and resources seem

lacking. Adequate funding to support monitoring, collaborative science, and adaptive management is a chronic problem. Section ES.4.2 states that "Proponents of the collaborative science and monitoring program will agree to provide or seek additional funding when existing resources are insufficient." This suggests that these activities are lower in priority than they should be.

The three new alternatives, 4A, 2D, and 5A, seem to have modest changes over some previous alternatives, with the exception of not being accompanied by a more comprehensive environmental program. In terms of diversion capacities, they cover a wide range, 3,000 cfs (5A), 9,000 cfs (4A), and 15,000 cfs (2D). The tables comparing descriptions of the new alternatives to previous Alternative 4 are useful, but should be supplemented by a direct comparison of the three new alternatives.

The new Sustainable Groundwater Management Act (SGMA) seems likely to increase demands for water diversions from the Delta to the south to partially compensate for the roughly 1.5-2 maf/year that is currently supplied by groundwater overdraft.

The State seems embarked on a long-term reduction in urban water use, particularly outdoor irrigation. Such a reduction in urban water use is likely to have some modest effects on many of the water-demand and scarcity impacts discussed.

The climate change analysis of changes in Delta inflows and outflows is useful, but isolating the graphs in a separate document disembodies the discussion. The fragmentation of the document by removing each Section 4 figure into a separate file is inconvenient for all, and makes integrated reading practically impossible for many.

The details of the alternative analyses seem mostly relevant and potentially useful. Much can be learned about the system and the general magnitude of likely future outcomes from patient and prolonged reading of this text. An important idea that emerges from a reading of the No Action Alternative is that the Delta, and California water management, is likely to change in many ways with or without the proposed project. The No Action and other alternatives also illustrate the significant inter-connectedness of California's water system. The range of impacts considered is impressive, but poorly organized and summarized.

The discussion of disinfection by-product precursor effects in Delta waters is improved significantly, but could be made more quantitative in terms of economic and public-health impacts.

The discussion on electromagnetic fields is suitably brief, while the tsunami discussion could be condensed.

The effects of the likely listing of additional native fish species as threatened or endangered seems likely to have major effects on project and alternative performance. These seem prudent to discuss, and perhaps analyze.

Is Alternative 2D, with 15,000 cfs capacity, a serious alternative? Does it deserve any space at all?

Table 4.1-8 implies that tidal brackish/*Schoenoplectus* marsh. Should some of this be considered tidal freshwater marsh?

The dynamics of the Delta are largely determined by water flows. The Current Draft acknowledges that water flows and salinity will change in complex ways. There are statements about how inflows, outflows, and exports will change in Alternative 4A in relation to baseline (No-Action) conditions (p. 4.3.8-13). What is the scientific basis on which these changes will be managed? Will models be used? What confidence should we have in current projections? Have the effects of droughts or deluges been considered?

4.3.7-10, line 13: Text on disturbing sediments and releasing contaminants needs to add nitrogen and phosphorus to the concerns.

Water quality (Chapter 8)

8-3, line 13: *Microcystis* is singled out as a cyanobacterium that can (but doesn't always) produce the toxin, myrocystin; however, there are other cyanobacteria that sometimes produce other toxins. Different genera can differ in the nutrient that limits their blooms (see 2014 letter by Hans Paerl in Science 346(6406): 175-176). For example, *Microcystis* blooms can be triggered by N additions because this species lacks heterocysts, while toxin-producing *Anabaena* blooms can be triggered by P additions, because *Anabaena* has heterocysts and can fix N. The frequently repeated discussion of cyanobacteria blooms needs to be updated. Also cite Paerl on page 8-45 line 8. Ditto on page 8-103 and 8-106 line 34.

8-8. In our earlier comments, we recommended that carbon be separated into its dissolved and particulate forms for consideration of water quality impacts because dissolved organic carbon (DOC) is the form most likely to react with chloride and bromide and result in formation of disinfection by-products. The section on bromide focuses on interactions with total organic carbon (TOC), rather than DOC. Carbon is primarily considered with respect to formation of disinfection by-products but carbon plays a central role in the dynamics of the Delta, affecting processes such as metabolism, acidity, nutrient uptake, and bioavailability of toxic compounds. Carbon cycling determines ecosystem structure and function in aquatic systems. It also modifies the influence and consequences of other chemicals and processes in aquatic systems. Dissolved organic carbon (DOC), for example, influences light and temperature regimes by absorbing solar radiation, affects transport and bioavailability of metals, and controls pH in some freshwater systems. Respiration of organic carbon influences dissolved oxygen concentrations and pH.

8-18, line 12 says that salt disposal sites were to be added in 2014; were they?

8-19 and 8-20: "CECs" is not defined and seems to be used incorrectly. Change "CECs" to "EDCs" on page 8-19 and to "PPCPs" on page 8-20.

8-21, line 18-19: Such a statement should be qualified. The conclusion that marine waters are N-limited and inland waters are P-limited is outdated. Recent papers, including the above, find more complex patterns.

8-22, lines 18 and 30: Choose either "cyanobacteria" or "blue-green algae;" using both will confuse readers who may perceive them as different.

8-23, lines 15-16: Say how the N:P ratio changed composition, not just that it did change composition.

8-23 through 8-25: Uncertainties (e.g., standard deviation or standard error of the mean) associated with the mean concentrations of DOC should be presented. It is impossible to interpret differences between the values that are presented without knowledge of the variation around the mean values (e.g., without knowledge of variation around the mean, it is difficult to evaluate whether DOC concentrations at south vs. north-of-Delta stations and Banks headworks differ from one another; 3.9 to 4.2 mg/L vs. 4.3 mg/L).

8-65, line 12: Specify if DO is for daytime or night, and for surface, bottom or mid-water column.

8-75, line 6: The failure to consider dissolved P (DP) should be addressed; there is much greater uncertainty. The adherence of some P to sediment does not prevent considerable

discharge of P as DP. Also on page 8-95 line 40, qualify predictions due to lack of consideration of DP.

8-82, line 4-5: It seems unlikely that current levels of *Microcystis* growth in the Delta are dependent on the exclusive uptake of ammonia. Temperature is one of the primary factors driving *Microcystis* blooms and global warming could promote bloom occurrence. Consider revising this section to, "Because it seems unlikely that current levels of *Microcystis* growth in the Delta are dependent on the exclusive uptake of ammonia, the frequency, magnitude and geographic extent of *Microcystis* under future scenarios is difficult to predict."

8-105, line 8: Would total nitrogen be dominated by nitrate just by increasing ammonia removal? Depending on redox and microbiota, why wouldn't nitrate be converted to ammonium?

A lot of attention is given to factors controlling *Microcystis* blooms in this chapter but little attention is given to its toxicity. Just as factors controlling blooms are not fully understood, the regulating factors of cellular toxin contents remain poorly understood. As a result, the impact of blooms on the environment can vary (e.g., large blooms of non-toxic or low toxin organisms may have impacts on environmental variables such as nutrient uptake and dissolved oxygen consumption while small blooms of highly toxic organisms could impact food webs) [see: Ma et al. (2015) Toxic and non-toxic strains of *Microcystis aeruginosa* induce temperature dependent allelopathy toward growth and photosynthesis of *Chlorella vulgaris*. Harmful Algae 48: 21–29].

Fish and aquatic resources (Chapter 11)

We found individual conclusions or new analyses difficult to identify in this key chapter because changes to it were not tracked in the public version of the Current Draft and there was no table of contents that could have assisted in side-by-side comparison with the Previous Draft.

Effects of temperature

We noticed more emphasis on temperature concerning the fish 'downstream' impacts (but without tracked changes this becomes difficult to document).

The main temperature variable used expresses the percentage of time when monthly mean temperatures exceed a certain rate or fall within a certain boundary. The biological impact, however, is difficult to assess with these numbers. If all of the change occurred just during operations or just during one day, the biological impact could be much different than a small change every day (provided by using means). Graphs of changes and listing of extreme highs and lows during a model run would have more biological meaning. Also, comparisons were made using current baseline conditions and did not consider climate change effects on temperatures.

Fish screens

It is unclear how (and how well) the fish screens would work. The description of fish screens indicates that fish >20 mm are excluded, but what about fish and larvae that are <20 mm, as well as eggs? Table 11-21 seems out of date, because some fish screens appear to have been installed, but data on their effects are not given. Despite the lack of specific data on how well screens function, the conclusion that there will be no significant impact is stated as certain (e.g., page 1-100 line 38).

Here, as in many other places, measures are assumed to function as planned, with no evidence to support the assumptions. The level of certainty seems optimistic, and it is unclear whether there are any contingency plans in case things don't work out as planned. This problem persists from the Previous Draft.

Invasive plants

Cleaning equipment is mentioned, but it is not specifically stated that large machinery must be cleaned before entering the Delta. Section 4.3.8-358 says equipment would be cleaned if being moved within the Delta. Cleaning is essential to reduce transfer of invasive species; a mitigating measure is to wash equipment, but it must also be enforced.

Weed control (fire, grazing) is suggested, but over what time frame? It may be needed in perpetuity. That has been our experience at what is considered the world's oldest restored prairie (the 80-yr-old Curtis Prairie, in Madison, WI).

Weed invasions can occur after construction is completed; how long will the project be responsible for weed control? 3-5 years won't suffice.

4.3.8-347. Herbicides are prescribed to keep shorebird nesting habitat free of vegetation, but toxic effects of herbicides on amphibians etc. are not considered.

4.3.8-354. Impacts of invasive plants seem underestimated. Impact analysis implies that the project disturbance area is the only concern, when dispersal into all areas will also be exacerbated. At the Arboretum, a 1200-ac area dedicated to restoration of pre-settlement vegetation, invasive plants are the main constraint. A judgment of no significant impact over just the disturbance area is overly optimistic.

4.3.8-356. Does not mention need to clean equipment to minimize import of seeds on construction equipment.

Cryptic acronym and missing unit

Figure 2: SLR x year: y axis lacks units; reader has to continue on to table 11-20 to find that it is cm.

Terrestrial biological resources (Chapter 12)

Effects on wetlands and waters of the United States (WOTUS)

Page 12-1, line 18-19 says: "Under Alternatives 2D, 4 , 4A , and 5A, larger areas of non-wetland waters of the United States would be filled due to work in Clifton Court Forebay; however, the Forebay would ultimately expand by 450 acres and thus largely offset any losses there." Is the assumption that, acre for acre, all jurisdictional waters are interchangeable, whether of different type or existing vs. created? The literature does not support this assumption.

The text argues that the wetlands would be at risk with levee deterioration, sea-level rise, seismic activity, etc. But the solution is for "other programs" to increase wetlands and riparian communities. What if this project causes the problem, e.g. via vibration?

CM1 alternative 4A would fill 775 acres of WOTUS (491 wetland acres); Alt 2D would fill 827 (527 wetland) + 1,931 ac temporary fill at Clifton Court Forebay; Alt 5A would fill 750 (470 wetland). That's a lot of area. The timing and details of mitigation measures are not provided. References to the larger Delta Plan suggest that compensations would come at unknown times. Piecemeal losses such as indicated here: "Only 1% of the habitat in the study area would be filled or converted" (Chapter 12, line 29, page 12-22) is how the US has lost its historical wetlands. What are the overall cumulative impacts of wetland losses in the Delta? What is the tipping point beyond which further wetland losses must be avoided? The proposed project is one part of the broader array of management actions in the Delta and should be considered in that broader context.

Habitat descriptions

How will mudflats be sustained for shorebirds? Exposed mud above half-tide can become vegetated rapidly. In the Delta, the bulrush *Schoenoplectus californicus* tolerates nearly continuous tidal submergence.

Are soils clayey enough for the proposed restoration of up to 34 acres of vernal pool and alkali seasonal wetland near Byron? These areas will need to pond water, not just provide depressions.

12-243, line 18: How would adding lighting to electrical wires eliminate any potential impact to black rails? This mitigation is overstated.

Several of the species accounts (e.g., bank swallow) indicate that there is uncertainty about how construction or operations will impact the species. In most cases, monitoring is proposed to assess what is happening. But to be effective, the monitoring results need to be evaluated and fed into decision-making, as visualized in the adaptive-management process. There is little explicit indication of how this will be done or funded.

Land use (Chapter 13)

Alternative 4A would allow water diversion from the northern Delta, with fish screens, multiple intakes, and diversions limited to flows that exceed certain minima, e.g., 7000 cfs. This would reduce flood-pulse amplitudes and, presumably, downstream flooding. How does this alter opportunities for riparian restoration? Which downstream river reaches are leveed and not planned to support riparian restoration? Where would riparian floodplains still be restorable?

Over what surface area does the pipeline transition to the tunnel? At some point along the pipeline-tunnel transition, wouldn't groundwater flow be affected?

Up to 14 years of construction activities were predicted for some areas (e.g., San Joaquin Co.); this would have cumulative impacts (e.g., dewatering would affect soil compaction, soil carbon, microbial functions, wildlife populations, and invasive species). What about impacts of noise on birds; e.g., how large an area would still be usable by greater sandhill cranes?

State how jurisdictional wetlands have been mapped and how the overall project net gain or net loss of wetland area has been estimated. If mitigation consists only of restoration actions in areas that are currently jurisdictional wetlands, then there would be an overall net loss of wetland area due to the project. A mitigation ratio >1:1 would be warranted to compensate for reduced wetland area. This was also a concern for Chapter 12.

Up to 277 ac of tidal wetlands are indicated as restorable; text should indicate if these are tidal freshwater or tidal brackish wetlands (or saline, as is the typical use of "tidal wetlands").

13-19. On the need to store removed aquatic vegetation until it can be disposed: there are digesters for this purpose, and they might be efficient means of mitigation if management of harvested aquatic plants will be long-term. A waste product could be turned into a resource (methane fuel).

13-19, line 12: Text says that "predator hiding spots" will be removed. What are these?

13-19, line 20: What are the E16 nonphysical fish barriers? An electrical barrier?

13-20, line 19: Boat-washing stations are mentioned; would these discharge pollutants (soap, organic debris?)

'H2O Hackathon' seeks solutions to drought issues

Elizabeth Diaz, left, Walter Sorenson, Gabriel Marrujo and advisor Robin Shum of the San Joaquin Delta College STEM Academy, developed an app that will help users save water while taking showers. CALIXTRO ROMIAS/THE RECORD

By Alex Breitler
Record Staff Writer

Posted Oct. 9, 2015 at 8:39 PM

Eight teams. Nine hours. One monster drought.

Stockton's first "H2o Hackathon" ended Friday with some creative plans to slay that monster drought — ideas like text messages that warn you in real time if you've exceeded your water use goals, or games you can play on your smartphone as a reward for taking shorter showers.

If you've never been to a "hackathon," imagine brainiacs buried in their laptops, at tables covered with energy drinks, scribbled-upon notepads and half-empty pizza boxes.

The concept is simple: If you've got a problem, 50 heads are better than one.

And deadlines are good motivational tools. If you've got nine hours to put together a proposal and present it to a panel of judges — starting essentially from scratch — you might be surprised how much you can accomplish.

"I'm not a tech person. I am so out of my field," 19-year-old Elizabeth Diaz said with a laugh as her team from San Joaquin Delta College put together the finishing touches on its plan on Friday afternoon.

But that's what the day was about — learning and sharing.

Diaz's team whipped up a conceptual app that water users could load onto their smartphones. The app, "Shower Power," would entice people to spend less time in the shower each morning.

First, it would play their favorite song while they shower so that they know exactly how long they've been in there. No excuses.

Second, and more importantly, users would earn points for taking shorter showers. The points are applied to a game designed by Diaz's team. The more points users gain, the longer they can play the game.

"We just wanted something very simple, and the best way we could think of was to bring a fun game into it," Diaz said.

That was just one idea sprouting from Friday's hackathon, which was planned for the better part of a year by San Joaquin County government officials, educators, business groups and entrepreneurs.

One team of seven high school students from across the county worked with IBM experts to devise their own water-saving app. The students had no coding or programming experience at 8 a.m. Friday, but by 5 p.m. they were sharing a detailed PowerPoint presentation with the judges.

Their plan calls for placing sensors on shower heads, faucets and sprinklers. The sensors would track water use in real time, sending text messages or tweets that let users know how they're doing.

"You conserved 2 gallons today! Keep up the good work," one sample tweet trumpeted.

The tweet for those exceeding their goal was less positive: "Save your water or we will contact the authorities." The tongue-in-cheek message cracked up the judges.

Some plans were grandiose in scale. Stockton inventor Derric Juano suggested using geothermal heat to desalinate ocean water, by digging a shaft plunging miles below the Earth's surface and sending the saltwater through a reverse osmosis filter on its way toward the bottom. The brine would be pumped back to the surface, while the intense heat would transform the remaining freshwater into steam that would spin turbines to generate the power needed to run the system.

There's no shortage of creative thought when it comes to California water.

"I heard quite a few great ideas today. It got people thinking," said Bill Ries-Knight, a Stockton computer tech who suggested an app giving farmers real-time information on stream flows, water conditions and the nature of their water rights for whatever parcel of land they happen to be standing on.

Friday's ideas are just that — ideas. Creating a real app is a whole different task.

But don't be too surprised if, one day in the future, you find "Shower Power" on your phone in the app store.

"We did all of this today," Delta student and team member Gabriel Marrujo said. "And we're very proud of it already."

— Contact reporter Alex Breitler at (209) 546-8295 or abreitler@recordnet.com. Follow him at recordnet.com/breitlerblog and on Twitter @alexbreitler.

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Hyacinth forces holiday boat parade cancellation again

COMMENT 3

Water hyacinth clogs up a large part of the waterfront in downtown Stockton, forcing a cancellation of the Lighted Boat Parade for the second consecutive year. MICHAEL MCCOLLUM/FOR THE RECORD

By Alex Breitler
Record Staff Writer

Posted Oct. 12, 2015 at 1:41 PM
Updated Oct 12, 2015 at 8:16 PM

Another water hyacinth invasion has forced the cancellation of Stockton's Lighted Boat Parade for the second year in a row, raising questions about the long-term viability of one of the city's most unique holiday traditions.

Monday's announcement was a blow for those hoping that an extra $4 million dedicated to hyacinth control efforts and a more aggressive schedule for applying herbicides would lead to noticeable improvement in 2015.

"The hyacinth is worse already than it was last year at this time, and it's in many of the marinas," event organizer Lynn Hahn said Monday. "It's just everywhere."

Last year, the Marina West Yacht Club waited until late November to cancel the boat parade, which typically is held the first week in December.

The decision to pull the plug this year came earlier, partly because the weeds are getting worse, but also partly to avoid needless planning and organizational work for an event that doesn't appear likely to happen, Hahn said.

After 34 years of annual boat parades, Stockton will go at least two years without one. It is a safety issue, Hahn said; hyacinth often hides logs or other objects that can damage boats.

Asked whether she is concerned that the event may simply not be viable in the future, she said, "We're hoping that they get an answer to getting rid of the hyacinth."

But, Hahn noted, that hasn't happened yet.

The parade is a favorite in the boating community. Boaters come from all over the Delta, even as far away as Berkeley. They decorate their boats in holiday lights, line up near Windmill Cove and proceed into downtown Stockton while crowds watch from the shore.

The parade also benefits charity, with proceeds from the entry fees donated to the Women's Center of San Joaquin County.

Instead of having their entry fees refunded when the parade was canceled last year, boaters agreed to donate them as planned to the center.

"This year we will not have any money collected," Hahn said. "This is our one charitable event of the year. What hurts the most is it's always been our gift to the city."

Boater Roger Kelly, who lives along the Calaveras River just west of Interstate 5, said conditions have deteriorated significantly in just the past few days. The other day he maneuvered through a hyacinth patch that contained some debris — a large piece of foam with some 2-by-4 planks caught up in it.

"That's just scary," he said. "Inexperienced boaters don't know it's there."

Kelly said he's hopeful that when the drought ends, when rivers and streams finally flush out the Delta, that the parades will resume. A hard freeze this winter also would help.

An extra $4 million in state funding this year allowed officials to hire more technicians to spray Delta waterways with herbicide, and the state started spraying earlier in the season. About 2,963 acres have been treated so far this year, an increase from 2,617 acres all of last year.

But the amount the state can spray is tightly restricted in permits to protect fish. A separate task force is working to identify comprehensive solutions besides simply spraying, but that effort is expected to take years.

— Contact reporter Alex Breitler at (209) 546-8295 or abreitler@recordnet.com. Follow him at recordnet.com/breitlerblog and on Twitter @alexbreitler.

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U.S. COURT OF APPEALS DELAYS WOTUS RULE NATIONWIDE

THE LATEST

Last Friday, a federal court ordered the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) to temporarily delay nationwide adoption of the "Waters of the U.S." (WOTUS) rule. The order was in response to challenges brought by 18 states (Alabama, Florida, Georgia, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Utah, West Virginia and Wisconsin).

Two of the three 6th Circuit Court of Appeals judges held that the states bringing the challenges "have demonstrated a substantial possibility of success on the merits of their claims" and ordered the rule to be "STAYED, nationwide, pending further order of the court." However, in the coming weeks, the 6th Circuit Court of Appeals must determine whether it has the authority to hear the case.

This comes only after a separate decision on August 27 by the U.S. District Court of North Dakota to delay the rule in 13 states (Alaska, Arizona, Arkansas, Colorado, Idaho, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota and Wyoming). Prior to last week's Court of Appeals ruling, however, the EPA and the Corps were still legally allowed to implement the final rule in the remaining 37 states.

While numerous WOTUS cases have been filed by 31 states and other private parties in separate circuit courts, the U.S. Judicial Panel on Multidistrict Litigation decided that the cases would be merged in the 6th Circuit Court of Appeals because they are similar in nature. However, in a separate development, the same panel denied the Department of Justice's request to consolidate other WOTUS lawsuits filed separately in district court against U.S. EPA and the Corps.

This development only increases the complexity because it remains undetermined whether challenges to the rule will ultimately be heard in circuit or district courts. This will likely lengthen the timeframe of the rule's judicial proceedings.

STATE OF PLAY IN CONGRESS

On May 12, the U.S. House of Representatives passed the Regulatory Integrity Protection Act of 2015 (H.R. 1732) by a vote of 261-155. H.R. 1732 would withdraw the final rule and require the agencies to restart the rule-making process, inclusive of state and local governments. While the measure passed with a majority of votes, there were not enough to override a presidential veto.

The U.S. Senate has a similar bill, the Federal Water Quality Protection Act (S. 1140), that would also require the agencies to redo the "waters of the U.S." rule-making process. Additionally, the bill includes a set of principles the agencies should consider when rewriting the rule, including the types of ditches that should be exempt. S. 1140 passed out of the U.S. Senate's Committee on Environment and Public Works in July and is currently awaiting floor consideration. To see if your Senator is a cosponsor, click here.

The U.S. Senate could also take up S.J.Res. 22, a joint resolution expressing Congressional disapproval for the rule. The resolution currently has 49 cosponsors. To see if your Senator is a cosponsor, click here.

Additionally, although it remains unclear how Congress will proceed with finalizing the fiscal year 2016 appropriations process, both the U.S. House of Representatives and the U.S. Senate FY 2016 Interior, Environment, and Related Agencies appropriations bills include language to stop the final "waters of the U.S." rule from being implemented.

NACo RESOURCES

Since the proposal was unveiled in 2014, NACo has consistently requested that the agencies withdraw the WOTUS rule until future analysis has been completed and more in-depth consultation with state and local officials occurs. NACo has testified before Congress multiple times and has advocated for more collaboration and greater clarity. For more information, visit NACo's online resource hub and action center.

CONTACT

Julie Ufner, Associate Legislative Director, Environment, Energy & Land Use
202.942.4269 | jufner@naco.org

Mike Belarmino, Associate Legislative Director, Finance, Pensions & Intergovernmental Affairs; Associate General Counsel
202.942.4275 | mbelarmino@naco.org

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