

From: Lynes, Mike <mlynes@audubon.org>
Sent: Tuesday, July 29, 2014 3:01 PM
To: BDCP.comments@noaa.gov
Subject: Comments on the BDCP Draft EIR
Attachments: MBCP BDCP DEIR Comments 7-29-2014.pdf; CVJV Letter re BDCP May 2013.pdf; CVJV letter_BDCP_Jerry Meral July 2012.pdf

Hello Mr. Wulff,

Attached please find the joint comments of the Migratory Bird Conservation Partnership, which is comprised of The Nature Conservancy, Point Blue Conservation Science, and Audubon California. Each group may also submit additional comments independently.

Please note that two additional letters, from the Central Valley Joint Venture, are attached to our comments and incorporated by reference.

Thank you for consideration of our comments,
Mike Lynes

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BDCP1671

July 29, 2014

Via Electronic Submission and U.S. Mail

Ryan Wulff, NMFS
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814
Email: BDCP.comments@noaa.gov

RE: Draft Bay-Delta Conservation Plan Environmental Impact Report

Dear Mr. Wulff:

The Nature Conservancy, Audubon California, and Point Blue Conservation Science, are submitting these comments jointly as the Migratory Bird Conservation Partnership (MBCP). We appreciate this opportunity to review and comment on the Draft Bay-Delta Conservation Plan (BDCP) Environmental Impact Report (DEIR). Each organization may also submit additional, independent comments.

Since 2008, the Migratory Bird Conservation Partnership has worked with a broad array of partners to develop conservation solutions for birds, wildlife, and human communities alike. We continue to work with non-governmental organizations (NGOs), government agencies, and a collection of nontraditional allies – including sporting clubs and agricultural organizations – to find novel solutions to common problems.

The MBCP's comments focus primarily on Chapter 3 (Conservation Strategies), Appendix 5.A.1 (Climate Change Implications for Natural Communities and Terrestrial Species), and Chapter 29 (Climate Change). As it prepared these comments, the MBCP recognized several points of concern that recurred throughout the document. These concerns, and suggested improvements to address them, are listed below and discussed at greater length in the supporting technical comments, attached to this letter.

1. In many places in the document, the focus on a narrow group of threatened and endangered species has led to narrowly defined recommendations. With some relatively minor adjustments, the conservation measures can maintain their benefits for listed species and provide additional benefits for other species groups that will suffer impacts arising from the project, especially shorebirds and waterfowl. We offer specific suggestions about where these improvements can be made.
2. For cultivated lands that provide wildlife habitat, post-harvest management is an important consideration of habitat quality. Recommendations for post-harvest management should be included in any conservation measures that include wildlife-friendly agriculture. We have provide a number of references with more information on post-harvest management and have offered suggestions for where this information can be included.
3. There are a number of places where the conservation benefits of water management is incomplete. For example, the document does little to address the need for flooded fields for

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migrating shorebirds (e.g., early spring and late July). The document also fails to address water supply vulnerability if climate change impacts water delivery to areas that support restored riparian vegetation. We suggest where this information can be added to the document.

4. The plan should have a stated goal of maintaining or improving water deliveries to refuges. Water operations should consider direct and indirect impacts on refuge water deliveries. Refuge water supplies should be enhanced if the project results in increased exports. Changes in timing or quantity of refuge water delivered as a result of operations should be identified (by refuge, when, to what extent) and fully mitigated.
5. In all restoration and protection activities, we encourage the authors to consider any possible impacts of climate change and identify actions that enhance the resilience of these systems to the impacts of climate change. We have suggested ways in which the authors could incorporate climate-smart conservation principles into the restoration recommendations.
6. Monitoring of shorebirds, waterfowl, and riparian songbirds should be included in the plan as a way to evaluate whether management is creating habitat that is used by birds and other wildlife. Despite the emphasis on effectiveness monitoring to guide adaptive management, there is very little monitoring of actual bird populations proposed in the DEIR. More clearly articulating how wildlife monitoring will be used in the adaptive management framework would improve the document.

The MBCP remains concerned about the many uncertainties—especially to refuge water supplies and to important habitat areas outside the Plan Area—and provisions for research and monitoring. The BDCP will undoubtedly have very significant environmental impacts for decades to come, and it represents an opportunity to improve operations and ecosystem sustainability in and around the Delta.

If you would like to discuss our comments further, please do not hesitate to contact us through the current MBCP Chair, Catherine Hickey, Point Blue Conservation Science, at (415) 868-0371 x 307, or email at chickey@pointblue.org.

Respectfully submitted,

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Executive Director
Point Blue Conservation Science

Sandi Matsumoto
Senior Project Director, Migratory Bird Initiative
The Nature Conservancy

Michael Lynes
Director of Public Policy
Audubon California



BDCP1671

July 29, 2014

Supporting Technical Comments Prepared by the Migratory Bird Conservation Partnership (MBCP) to accompany the MBCCP comment letter regarding the Draft Bay-Delta Conservation Plan Environmental Impact Report

The MBCP's¹ begin with a discussion of overarching concerns and recommendations and then focus primarily on Chapter 3 (Conservation Strategies), Appendix 5.A.1 (Climate Change Implications for Natural Communities and Terrestrial Species), and Chapter 29 (Climate Change). Below are our detailed comments on the Draft Bay-Delta Conservation Plan Environmental Impact Report

I. THE DEIR SHOULD BE REVISED TO INCORPORATE RECOMMENDATIONS FROM THE CENTRAL VALLEY JOINT VENTURE AND THE DELTA INDEPENDENT SCIENCE BOARD.

A. The Central Valley Joint Venture's Recommendations Would Protect Wetlands, Water Supplies that Benefit Refuges and Wildlife, and Produce Better Adaptive Management Measures.

The MBCP recommends that the BDCP and subsequent implementation and adaptive management be based on the best available science and subject to stakeholder input and peer review, where possible. As written, the BDCP appears to rely on overly optimistic projections regarding the effectiveness of mitigation measures and outcomes from monitoring. Given the delicate ecology of the Delta and the potential for massive long term environmental impacts arising from the project, caution and fact-based decision making is necessary to ensure the success of the project.

Overall, the DEIR should be revised to ensure that BDCP activities (1) improve—not compromise—the condition of critical habitats in the Central Valley, (2) do not result in negative impacts to fish, wildlife, or their habitats, due to water transfers related to the BDCP, and (3) are designed to provide sustainable, predictable deliveries of water to all water users, including managers of wetlands that provide critical habitat for migratory birds.

The MBCP members are also members of the Central Valley Joint Venture (CVJV). As recommended by the CVJV in its letters of July 23, 2012 and May 24, 2013, the BDCP should improve—not compromise—efforts to conserve wildlife and habitat in and around the Delta. In its May 24, 2013 letter, the CVJV recommended that "all Delta-related planning efforts, including BDCP...adopt a goal to contribute to the attainment of the acreage, water and bird population goals set forth by the Central Valley Joint Venture Implementation Plan." The July 23, 2012 and May 24, 2013 letters are attached hereto and incorporated into these comments.

¹ The Migratory Bird Conservation Partnership is a collaborative effort between Audubon California, Point Blue Conservation Science, and The Nature Conservancy. For more information on the MBCP and its activities, please contact the MBCP Chairperson Catherine Hickey at chickey@pointblue.org.

Specifically, the MBCP restates the principles set forth in the July 23, 2012 letter:

- PRINCIPLE 1: *Avoid Detrimental Impacts to Wetland Water Supply*
- PRINCIPLE 2: *Mitigate for Impacts to Brackish and Freshwater Wetland-associated Birds and Bird Habitat.*
- PRINCIPLE 3: *Use Adaptive Management to Improve Mitigation Outcomes.*

Under each of these principles, the CVJV provides several specific actions that should be taken. While the DEIR addresses each of these concerns in turn, the MBCP is concerned with the DEIR’s adequacy in assessing these impacts, proposing mitigation measures, and ensuring adequate monitoring and adaptive management.

B. The Delta Independent Science Board’s Recommendations Would Improve the DEIR’s Scientific Content, Adaptive Management Framework, and Overall Readability.

The MBCP has also reviewed the Delta Independent Science Board’s report of May 15, 2014 (“DISB Report”) and concurs with many of the concerns raised therein.² Among those that generally apply to the DEIR, the MBCP agrees that the DEIR would be improved if the authors revised the draft to do the following:

- include meaningful summaries for each chapter;
- provide a clear and concise comparison of water-conveyance alternatives;
- improve and describe the framework for adaptive management and establish clear performance indicators and trigger points for adaptive management;
- identify assumptions relied upon in each chapter; and
- acknowledge uncertainties in conclusions.

(See DISB Report, at 10)

The DISB’s conclusions and recommendations concur with those provided by the Delta Science Program’s Independent Review Panel in its review of BDCP Chapter 5 (Effects Analysis). Specifically, the Independent Panel’s review found that Chapter 5 failed to:

- address critical uncertainties associated with presumed beneficial effects of tidal wetland restoration;
- clearly state critical assumptions underlying many proposed actions and consequences;
- clearly state how adaptive management will be implemented;
- present models with a range of possible scenarios;
- consider linkages and interactions;
- adequately analyze net effects; and
- acknowledge that habitat restoration is a lengthy process with uncertain results.

² Available at <http://deltacouncil.ca.gov/sites/default/files/documents/files/Attachment-1-Final-BDCP-comments.pdf>

(See DISB Report, at 10; see also Delta Science Board Program, Independent Review Panel Report Phase 3 (Review of Chapter 5 of the Draft BDCP))³ The Independent Review Panel’s criticisms could be applied to several sections of the DEIR, particularly a persistent failure to identify uncertainties and assumptions, analyze direct and indirect effects, and clearly layout an adaptive management framework.

II. CHAPTER 3: CONSERVATION STRATEGIES

A. Conservation Measure 1 (Water Facilities and Operations) Should Be Revised to Address Impacts to Refuge Water Supplies.

1. BDCP should benefit refuge water supplies.

Public wildlife refuges rely on the Central Valley Project and State Water Project for water supplies, and are therefore impacted by BDCP operations. If the system becomes more reliable, enabling more water to be exported as a result of conveyance improvements, then the public wildlife refuges south-of-Delta should benefit.

Water deliveries to these refuges are mandated under federal law under the Central Valley Project Improvement Act (CVPIA), yet remain unfulfilled.⁴ Improvements to refuge water deliveries should be made by 1) taking advantage of the extended window for through-Delta transfers to enable CVPIA Level 4 supplies to be acquired north-of-Delta and transferred south-of-Delta; 2) providing assurances that pumping and conveyance capacity are available for refuge supplies; and 3) establishing refuges as a priority for delivery under system operations in any year type.

2. The DEIR should be revised to consider direct impacts to refuge water supplies.

The DEIR does not adequately contemplate water supply impacts arising from the BDCP operations on wildlife refuges. BDCP operations will affect the timing and quantity of deliveries across water years. These impacts should be identified, including the specifics about which refuges are impacted, when and to what extent. Timing of impacts is especially important, since migratory bird habitat needs vary across months, weeks and water years. Impacts should consider the type of habitat impacted, as well as the species. Any detrimental impacts should be fully mitigated.

3. The DEIR should be revised to consider indirect impacts to refuge water supplies.

Because the water system is intertwined, each water management decision under BDCP will have system-wide impacts. For example, if additional outflow is needed through the Delta and operations at

³ Available at http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf

⁴ A major environmental accomplishment of the Central Valley Project Improvement Act (CVPIA) was the commitment to deliver to refuges and wildlife areas in the Central Valley a firm (Level 2) yield of 422,252 acre-feet, 37% of the annual water needs for existing wetlands. In addition, CVPIA mandated that an additional 133,264 acre-feet of so-called Level 4 water be acquired over a ten-year period commencing in 1992, thus ensuring that roughly half of refuge water needs would be met by the project. Between 1992 and 2009, legally mandated water supplies for the refuges fell short by more than 40,000 acre-feet from mandated Level 4 quantities; the current and future droughts create the risk that even less water is likely to be delivered for refuges and wildlife.

Oroville are altered to address this issue, there are likely impacts to Shasta operations that could impact refuge water deliveries. We ask that any water operation decisions include assessment of system-wide impacts and explicitly identify (which refuges, when and how) and address impacts to refuge water supplies.

B. Conservation Measure 3 (Natural Communities Protection and Restoration) Should Be Revised to Consider a Broader Range of Native Species and to Clarify Objectives for Acquired Lands.

In Conservation Measure 3 (CM-3), the document describes the acquisition of approximately 70,000 acres to protect and enhance areas of existing natural communities and covered species habitat. These areas would also be designed to provide connectivity to existing conservation lands inside and outside the Plan Area. This Conservation Measure is the system that would be used to achieve the habitat protection described in Section 3.3, the Biological Goals and Objectives. The information in Table 3.4.3-1 covers the acreages called for in many of the other Conservation Measures.

1. Conservation Measure 3 should include consideration of species of special concern and other species vulnerable to climate change.

CM-3 focuses on “covered species” with “other native species” rarely mentioned. There is no discussion of the California Department of Fish and Wildlife’s California Bird Species of Special Concern,⁵ the species and subspecies that are mostly likely to end up being “covered” (e.g., listed as threatened or endangered) species if no conservation actions are taken.

We also suggest that the list of species be expanded to include non-listed species such as those that are vulnerable to climate change. (See, e.g., Gardali et al. 2012)⁶ These species could be cross-walked with the covered species to show where conservation actions could benefit multiple species.

Among the many species that merit greater consideration, Tricolored Blackbird should be assessed in greater detail. In particular, siting and reserve design (discussed below) should propose an expansion of protected and restored acreage for this species. Currently, the document discusses protection of 50 acres for the species and fails to recommend restoration of any acreage to benefit Tricolored Blackbirds. Given this species is in steep decline under current conditions, the DEIR should improve its analysis of impacts to Tricolored Blackbird, and identify and recommend additional mitigation measures that are in alignment with the Conservation Plan for this species.⁷ Moreover, given that the species is currently being considered for emergency listing under the California Endangered Species Act (CESA), management of this species will be mandatory within the Plan Area.⁸

⁵ Shuford and Gardali 2008, available at <https://www.dfg.ca.gov/wildlife/nongame/ssc/birds.html>

⁶ Available at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0029507>

⁷ Available at <http://tricolor.ice.ucdavis.edu/node/579>

⁸ See California Fish & Game Commission, Agenda for August 6, 2014 meeting, Item 11: POSSIBLE ADOPTION OF EMERGENCY REGULATION TO ADD TRICOLORED BLACKBIRD (*Agelaius tricolor*) TO THE LIST OF ENDANGERED SPECIES (PURSUANT TO SECTION 2076.5, FISH AND GAME CODE), available at <http://www.fgc.ca.gov/meetings/2014/aug/080614agd.pdf>.

2. Goals for habitat protection and restoration should be better explained, describe management, and be connected with actual benefits for species rather than merely describing acreages.

Conservation Measure would be improved by providing the underlying reasoning or evidence supporting the determination of proposed acreages or restoration goals to benefit various species. Currently, a reviewer cannot confidently assess the adequacy of the conservation measure on these grounds.

In addition to land acquisition, it is essential for the EIR to set forth how wetland areas will be managed, as the value of managed wetlands to particular species can vary dramatically (e.g., water depths, height and percentage of vegetation, etc.). Obviously, the ability of this conservation measure to meet its goals will depend greatly on how certain wetland areas are managed over the life of the project.

3. Siting and reserve design should be clarified and include additional management practices and multispecies benefits, with the ultimate outcome based on quality habitat used by the target species.

Table 3.4.3-1 summarizes much of CM-3's siting and reserve design objectives. (See DEIR, at 3.4-76-88). While the MBCP supports the initial plan to protect 8,100 acres of managed wetlands, the section would be improved by considering areas outside of the Suisun Marsh, particularly areas that can support multiple taxa under a variety of climate change scenarios.

The MBCP supports restoration of at least 500 acres of habitat to specifically benefit roosting Sandhill cranes. However, we believe that there is room in the plan to include specific restoration actions for other waterbird groups and thereby increase capacity for them in the Delta. We encourage the inclusion of restoration actions that can benefit waterfowl, shorebirds, and long-legged waders.

The document proposes protecting 48,625 acres of cultivated lands. Of this, protection goals are given for total acreage and the quality of those acres for various covered species. For cultivated lands, we noted the following issues:

- **Lack of consistency.** It is unclear why the quality requirement is "moderate" or higher for some species (e.g., Swainson's Hawk, nonbreeding Tricolored Blackbird) but "high" or "very high" for other species (Greater Sandhill Crane); note that the table of habitat values for Swainson's Hawk (3.4.3-3) does not actually have a moderate category. Further, why should 80% of foraging habitat be of "very high" value for cranes but only 50% should be of "very high" value for Swainson's Hawks?
- **Management practices.** The document has various tables that list the relative value of various crops to particular species. Given just the crop names are listed this appears to assume that the value of a crop is the same regardless of what the post-harvest management practice is, which is not the case. We suggest adding information to this table on post-harvest practices and their relevant values.⁹ Doing so will provide greater guidance and clarity on the benefits and trade-offs.

⁹ Relevant studies regarding crop management on birds include:

- **Compatibility.** Although the protected acreage requirement for a particular species “may overlap with species-specific cultivated land requirements for other species,” there appears to be no analysis of whether all of these acreage goals are compatible. For example, of the 48,625 acres of cultivated lands slated for protection, the Swainson’s Hawk requires 43,325 acres, which leaves only 5300 acres for crops that are not of moderate or higher value for the hawks. But cranes are allotted 7300 acres of cultivated lands for foraging, for which 80% (5840 acres) must be of very high value (see Table 3.4.3-1). The two crops of very high value for cranes are corn and rice (Table 3.4.3-2), neither of which are of suitable value for Swainson’s Hawks (Table 3.4.3-3). Hence the requirements for both of these species are more than is allocated for all species combined even assuming no other incompatibilities when looking at other species’ requirements.
- **No net loss?** It is unclear as to whether under the proposed protection and restoration scenarios for various species if there would be a net gain in habitat for covered species, or if there still might be loss of overall habitat in the Delta Plan area. Moreover, it is unclear if this may vary between natural habitats and cultivated lands. It is important to explain this clearly in the document.

Overall, while acreage goals provide a good starting point, the outcomes must be based on measures of habitat quality. These measures should include habitat use by target species, including explicit metrics that capture different habitat needs of various migratory and resident birds, by season and location. The ultimate outcome should focus on meeting the needs of these species, rather than simply creating targeted acreage.

C. Conservation Measure 5 Should Expand Its Discussion of Restoration Opportunities and Discuss Overlap with other Restoration Opportunities.

Conservation Measures 5 (Seasonally Inundated Floodplain Restoration) describes the restoration of 10,000 acres of seasonally inundated floodplain. (See DEIR, at 3.4-145) This restoration could be accomplished by expanding floodway bypasses, setting back levees, grading restored floodplains, and removing rip-rap. The most promising opportunities are in the south Delta. Much of this area would overlap with the 5,000 acres of riparian vegetation to be restored under Conservation Measure 7.

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- Shuford, W. D., M. E. Reiter, K. M. Strum, C. J. Gregory, M. M. Gilbert, and C. M. Hickey. 2013. The effects of crop treatments on migrating and wintering waterbirds at Staten Island, 2010–2012. Final Report to The Nature Conservancy, 190 Cohasset Road, Suite 177, Chico, CA 95926.
 - Shuford, W. D., M. E. Reiter, K. M. Strum, M. M. Gilbert, C. M. Hickey, and G. H. Golet. The benefits of crops and field management practices to wintering waterbirds in the Delta. Submitted to *California Agriculture*.
 - Sterling, J. 2011. Review of literature and information on the bird use of certain agricultural crops in California’s Central Valley. Report to the Nature Conservancy.
 - Strum, K. M., M. E. Reiter, C. A. Hartman, M. N. Iglecia, T. R. Kelsey, and C. M. Hickey. 2013. Winter management of California’s rice fields to maximize waterbird habitat and minimize water use. *Agriculture, Ecosystems, and the Environment* 179:116–124.
 - Taft, O. W., and C. S. Elphick. 2007. Waterbirds on working lands: Literature review and bibliography development. National Audubon Society, Inc., New York.

We concur with the need for inundated floodplain forest and we encourage the authors to recognize the opportunity to develop multiple-benefit floodplain projects (such as set-back levees and expanded bypasses) that can accomplish these restoration goals. More information on the multiple-benefit floodplain approach can be found here: <http://www.multibenefitproject.org/>.

D. Conservation Measure 7 Should Include Climate-smart Restoration Opportunities and an Improved Adaptive Management Framework.

Conservation Measure 7 describes the restoration of 5,000 acres of riparian forest and scrub. (DEIR, at 3.4-162) This area would overlap with the area restored for Tidal Natural Communities (Conservation Measure 4), Seasonally Inundated Floodplain Restoration (Conservation Measure 5), and Channel Margin Enhancement (Conservation Measure 6). Conservation Measure would be greatly improved by considering restoration opportunities that anticipate ecological changes arising from climate change and including improve adaptive management triggers, monitoring, and management measures.

1. Section 3.4.7.3.2 (Restoration Approaches) should consider climate-smart restoration opportunities.

The introductory paragraphs to 3.4.7.3.2 provide a suite of resources that will be used to inform the restoration designs. In addition to these sources, the MBCP encourages the authors to also consider how the restoration designs can be used to enhance resilience to climate change (e.g., climate-smart restoration). These concepts are relatively new, and are not covered carefully in the resources that are currently listed. A framework for climate-smart restoration can be found at <http://www.pointblue.org/our-science-and-services/conservation-science/habitat-restoration/climate-smart-restorationtoolkit>.

2. Section 3.4.7.4 (Adaptive Management and Monitoring) would be improved by including better requirements for monitoring, research, and triggers for additional management measures.

Section 3.4.7.4 addresses adaptive management and specifically calls for both compliance monitoring and effectiveness monitoring. (DEIR, at 3.4-171). Specifically, it states:

Table 3.4.7-3 lists monitoring actions, metrics, success criteria, and schedules relevant to CM7, for incorporation into site-specific riparian restoration plans, as appropriate. The actual monitoring actions, success criteria, metrics, and timing will be based on the best available information at the time of implementation and may be adjusted or augmented over time through adaptive management.

(DER, at 3.4-171:4-8)

The Central Valley Joint Venture riparian songbird focal species should be added to this list.¹⁰ These focal species were selected in order to monitor the biological response to restoration, especially when the target species (e.g., Yellow-billed Cuckoo and Least Bell's Vireo) may not respond in a timely manner simply because they are extremely rare.

¹⁰ Available at http://www.centralvalleyjointventure.org/assets/pdf/CVJV_fnl.pdf

E. Conservation Measure 10 Should Revised to Discuss Benefits to Multiple Species and Improve the Proposed Adaptive Management Framework.

Conservation Measure 10 describes the restoration of 1,200 acres of nontidal freshwater wetlands and 500 acres of managed wetlands for Greater Sandhill Crane roosting habitat in the Greater Sandhill Crane Winter Use Area. The restored marsh would provide giant garter snake habitat, and support waterfowl habitat.

Conservation Measure 10 discusses habitat designed and managed primarily for giant garter snakes but also for other wildlife, including waterfowl and shorebirds, "to the extent that management for these species does not reduce habitat value for the giant garter snake." The MBCP strongly suggests that a table be provided that specifically lists the other species considered in this statement so benefits to them could be better understood.

Section 3.4.10.2.1 (Restoration Action) lacks adequate details to understand the benefits to cranes. (See DEIR, at 3.4-196)

F. Conservation Measure 11 Should Be Revised to Include Additional Management Measures to Benefit Multiple Species and Improve Its Adaptive Management Framework.

Conservation Measure 11 describes the preparation and implementation of management plans for the protected habitats and covered species and for monitoring and maintenance of these sites in perpetuity. (DEIR, at 3.4-202)

Section 3.4.11.2.1 (Enhancement and Management Principles) includes a good list of management principles. The MBCP encourages the plan authors to add "Prepare for climate change impacts" to this list. Doing so will help ensure that the management actions remain forward looking.

Section 3.4.11.2.4 (Aquatic and Emergent Wetland Natural Communities) should include language to improve flooded roost sites by incorporating the following actions:

- Flood earlier (mid-July) to maintain shallow water during the early part of fall migration when such habitat is very limited on the broader landscape. Work with mosquito districts to maintain shallow water but avoid mosquito problems, perhaps by pulse flooding and drawing down water periodically so it does not stay on too long; this also would reduce the likelihood of unfavorable vegetation growth.
- Provide shallow slope to sides to enhance edge conditions by a gradual increase in water depths to favor shorebird species using different depths; and
- Provide some unvegetated islands or internal levees for roosting.

Section 3.4.11.2.7 (Cultivated Lands) lacks adequate details regarding post-harvest management, which can greatly affect cultivated lands' value to different species or groups. The section should address whether lands will be flooded or left dry, deeply tilled vs lightly tilled (keeping grains near surface), etc. The section should also address the following:

- Timing and flooding for cranes and provide additional info on depth of flooding, which can affect compatibility for shorebirds (various depths from mudflats to about 15 cm).¹¹ (DEIR, at 3.4-236)
- The DEIR should assess a chop-and-roll post-harvest practice on corn (used on Staten Island) prior to flooding. This knocks down remaining stubble, which reduces weed growth, retains soil moisture, puts crop residues in contact with the soil to aid in decomposition, and provides more open foraging opportunities for cranes, waterfowl, and shorebirds.¹²

The section on Managed Wetlands: Waterfowl and Shorebirds would be improved by further review of available scientific literature. (See DEIR, at 3.4.-239) The MBCP recommends that the plan authors review the materials cited here and revise the plan accordingly.¹³

- The section should also be further improved by including more specifics about management actions, including the following:
 - **Drawdowns.** In the spring, drawdowns should be staggered across various ponds to provide shallow water for shorebirds over a longer period (early March to early May). Mid-winter drawdowns should be conducted to provide additional shallow water and mudflat habitat for shorebirds, exposing invertebrate resources that previously were not available (such drawdowns and subsequent reflooding may also help with salt management). When feasible and where it will not promote excessive vegetation growth, flood up should start in July with staggered flood up through the time of greater flood up for waterfowl in September and October.
 - **Breeding shorebird habitat.** The plan should include specific management recommendations to promote successful shorebird breeding. These include grading ponds to be open and with gradual slopes for foraging in shallow water. Bare or sparsely vegetated islands (or internal levees) should also be provided for nesting.¹⁴

Section 3.4.11.3 (Adaptive Management and Monitoring) should be revised to improve the adaptive management framework and monitoring. As discussed further below, the section fails to identify triggers

¹¹ See Ivey, G. L., B. D. Dugger, C. P. Herziger, M. L. Casazza, and J. P. Fleskes. 2011. Sandhill Crane use of agricultural lands in the Sacramento–San Joaquin Delta. Final Report to the California Bay-Delta Authority.

¹² See Shuford, W. D., M. E. Reiter, K. M. Strum, C. J. Gregory, M. M. Gilbert, and C. M. Hickey. 2013. The effects of crop treatments on migrating and wintering waterbirds at Staten Island, 2010–2012. Final Report to The Nature Conservancy, 190 Cohasset Road, Suite 177, Chico, CA 95926

¹³ Additional studies include:

- Helmers, D. L. 1992. Shorebird management manual. Western Hemisphere Shorebird Reserve Network, Wetlands for the Americas, Manomet, MA.
- Hickey, C., W. D. Shuford, G. W. Page, and S. Warnock. 2003. The Southern Pacific Shorebird Conservation Plan: A strategy for supporting California’s Central Valley and coastal shorebird populations, version 1.1. PRBO Conservation Science, 4990 Shoreline Hwy. 1, Stinson Beach, CA (available at http://www.prbo.org/cms/docs/wetlands/SPSCPlan_010904.pdf)
- Central Valley Joint Venture. 2006. Central Valley Joint Venture Implementation Plan – Conserving Bird Habitat. U.S. Fish and Wildlife Service, Sacramento (available at http://www.centralvalleyjointventure.org/assets/pdf/CVJV_fnl.pdf)

¹⁴ See Engilis, A., Jr., and F. A. Reid. 1996. Challenges in wetland restoration of the western Great Basin. *International Wader Studies* 9:71–79 available at <https://sora.unm.edu/sites/default/files/journals/iws/n009/p00071-p00079.pdf>.

