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Specially Appearing for Save Our Sandhill Cranes for Purposes of Presenting Part 2 Testimony

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

HEARING IN THE MATTER OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND UNITED STATES BUREAU OF RECLAMATION REQUEST FOR A CHANGE IN POINT OF DIVERSION FOR CALIFORNIA WATER FIX	**TESTIMONY OF ED PANDOLFINO, Ph. D. - REVISED** **SAVE OUR SANDHILL CRANES**

I. INTRODUCTION

I earned a Ph.D. in Biochemistry from Washington State University. After twenty years working in various management positions in the medical device industry, I retired in 1999 and have since devoted my time to ornithology. I served as president of Western Field Ornithologists, vice-president of San Francisco Bay Bird Observatory, conservation chair for Sierra Foothills Audubon Society, and Regional Editor for Northern California for North American Birds, and I am currently on the board of The Institute for Bird Populations. I have published more than three dozen articles on status, distribution, behavior of western birds, with a particular focus on California's Central Valley. I co-authored with Ted Beedy, Birds of the Sierra Nevada: Their Natural History, Status, and Distribution published by U.C. Press in May 2013. I have conducted field research and done consulting for the U.S. Forest Service, The Nature Conservancy, Point Blue, Sacramento Valley Conservancy, and Williams Wildland Consulting. Additional information regarding my qualifications relating to ornithology is included in SOSC-23.

In order to prepare this testimony regarding my avian-related concerns about the Delta Tunnels project (a.k.a. "California WaterFix"), I reviewed the analysis in the Final Environmental Impact Report/Statement ("FEIR/S"), my own experience and existing literature with respect to the Greater Sandhill Crane, the California Black Rail, and the White-Tailed Kite. All three of these species are fully protected species under California law, and no take is permissible. (Fish & G. Code, § 3511, FSL-28.) In my opinion, the project would be contrary to the public interest due to the high likelihood of take for each of the species discussed below.

II. TESTIMONY

A. Greater Sandhill Crane

In 2013, the Bay Delta Conservation Plan ("BDCP") concluded that collisions with transmission lines associated with the Project posed a significant hazard to Sandhill Cranes. (SWRCB-5, 2013 BDCP, Appendix 5J; FSL-29, FSL-30.) The project that is the subject of the current petition would rely largely on marking lines with bird diverter devices to reduce this risk. (SWRCB-102, FEIR/S, p. 12-3551.) The FEIR/S estimates the rate of mortality to cranes from collisions with unmarked lines and the potential for reducing those collisions by marking based mainly on studies conducted in the San Luis Valley, Colorado. (SWRCB-111, MMRP, p.4-33; see SOSC-35, Brown and Drewien 1995.) Alternative 4A proposed some changes to the project that could reduce the risk to cranes, including reducing the length of temporary and permanent power lines. (See, e.g., SWRCB-102, FEIR/S, pp. 12-3549 to 12-3551 [discussion of changes from BDCP to Alternative 4A].) However, I believe that the potential for take is underestimated in the FEIR/S.

1. The FEIR/S Estimate of Collision Risk Is Too Low

First, the analysis applied project too low of a risk for collision. Recent work by Murphy et al. (2016a), which combined searches for carcasses along lines with the use of electronic detectors of collisions and monitoring with night-vision spotting scopes showed that historical studies of crane collisions with transmission lines have likely underestimated Crane collision by at least a factor of three to four. (SOSC-44, sections 2.8 to 3.7, Murphy et al. 2016a.) Prior studies of collision risk relied mainly on searching for carcasses under transmission lines. The Murphy et al. (2016a) study, by combining carcass searches with remote sensing of collisions and observing at night with night-vision optics, showed that these studies greatly underestimated collisions. These authors found that many cranes injured in collisions were able to get beyond the area under the lines that are normally searched, and thus, these mortalities were missed. Nearly all (94%) collisions with lines occurred after dark; most of the collisions observed visually occurred after cranes were flushed. (SOSC-44, Murphy et al. 2016a.)

2. Estimated Effectiveness of Marking Lines Is Overly Optimistic

Second, while marking lines could help, its effectiveness is overstated. Recent extensive reviews of the effectiveness of bird diverters (SOSC-30, Barrientos et al. 2011; SOSC-27, APLIC 2012; SOSC-60 [Table 1, Comparison of Study Results for Effectiveness of Bird Diverters on Transmission Lines]) showed a wide range of effectiveness with rates of reduced collisions ranging from less than 10% to 81% for a variety of species, with effectiveness for Sandhill Cranes ranging from 50% to 67%.

3. Conditions in the Delta Make the Risk to Greater Sandhill Cranes Much Greater and the Potential Benefit of Marking Lines Much Smaller Than Estimated Based on Brown and Drewien (1995)

Fog, which is a very common factor in the Delta during the months cranes are present, poses a significant increase in risk for collisions and is likely to reduce the effectiveness of line marking. (SOSC-27, APLIC 2012; see also SWRCB-5, BDCP, Appendix 5.C, Att. 5.J.C (FSL-30).) On average, 39 of 120 days, or 32%, have significant fog in the Delta from November through February. (SOSC-58, Western Regional Climate Center 2017.) However, the study used to predict risk (SOSC-35, Brown & Drewien 1995) was conducted in the San Luis Valley, Colorado where foggy conditions are rare, occurring on average only 4 of the 90 days (4.4%) when cranes are present. (SOSC-58, Western Regional Climate Center 2017.) Thus, the occurrence of foggy conditions is more than 7 times more likely in the Delta than in the San Luis Valley of Colorado when Cranes are present. Yee studied effectiveness of bird diverters in the Delta and used an arbitrary correction factor (2.5) to assess risk of collision. (SOSC-59, Yee (2008).) This correction factor is well below that measured by Murphy. (SOSC-44, Murphy et al. 2016a.) And it is possible that the fog conditions in the Delta might even require the use of a higher correction factor than suggested by the work of Murphy et al. (2016a), which was conducted in the Platte River Valley, Nebraska.

Also, given that collisions are much more likely at night (SOSC-44, Murphy et al. 2016a), the fact that there are more hours of daylight in the San Luis Valley when most cranes are present (February–March, and October) than in the Delta when cranes are present (November–February), may further increase the risk of collisions and reduce the likely effectiveness of line marking.

4. Modifications to Alternative 4A in the FEIR/S Would Not Adequately Reduce the Risk to Greater Sandhill Crane Populations

As discussed earlier, some changes between the project described in the 2013 BDCP and the 2017 FEIR/S would be positive. Alternative 4A states that the new transmission lines within the main crane wintering area would not be permanent and would eventually be removed. (SWRCB-102, FEIR/S, pp. 12-2326 to 12-2327.) However, 31 miles of "temporary lines" (which will be in place for at least 10–14 years) would still be constructed within the crane wintering area, a reduction of only seven miles compared to the proposal analyzed in the 2013 BDCP. (SWRCB-5, BDCP, App. 5.J, Att. 5.J.C, p. 4.) The BDCP found that with marking of lines, 48 Greater Sandhill Crane deaths per year would still occur. (SWRCB-5, 2013 BDCP, App. 5.J, Att. 5.J.C, p. 24; see also FSL-29 and FSL-30.) Thus, take would still occur as long as the transmission lines are in place.

5. Drastically Increased Traffic and Other Activities in the Crane Use Area Would Increase the Frequency of Flushing of Cranes, Thus Increasing the Risk from Existing Transmission Lines

The observations of Murphy et al. showed that cranes are at particular risk when flushed. (SOSC-44, Murphy et al. 2016a.) Since the project would substantially increase traffic and other activities related to construction and ongoing monitoring and maintenance (see, e.g., SWRCB-102, FEIR/s, pp. 19-207 to 19-210 [expected increase in traffic throughout project area]), transmission lines already in place prior to the project would pose an increased risk.

6. Recommended Condition of Approval

Before any plan to mitigate risk from collisions with transmission lines is implemented, new studies would need to be conducted in the project area to determine the actual risk, given the findings of Murphy et al. that standard carcass searches significantly underestimated the number of collisions. (SOSC-44, Murphy et al. 2016a.) These studies should use methods similar to those used by Murphy et al., including the use of electronic collision detectors and night-vision optics. (SOSC-44, Murphy et al. 2016a.) Further, the use of glow-in-the-dark (or, perhaps lighted) bird diverters should be tested based on their potential to reduce collisions at night (SOSC-45, Murphy et al. 2016b).

The only alternative that would eliminate the risk of take of Greater Sandhill Cranes from collisions with transmission lines would be to place all lines associated with the project within the crane wintering area, permanent and temporary, underground. To reduce the heightened risk to cranes from flushing, all existing lines should be marked with bird diverts likely to be most effective after dark. As discussed in Friends of Stone Lakes NWR comments on the project, underground transmission lines would be feasible. (See SWRCB-102, Comments and Responses to Comments, Letter 1562, pg. 42 43 [2013] and Letter 2629, p. 186 [2015].) Yet, even with these conditions in place, I believe take of the Crane would still occur, which would be contrary to the public interest.

B. Project Effects on California Black Rail

The project's environmental review and permitting documents do not correctly characterize the behavior of the California Black Rail ("Black Rail"), as described below. The FEIR/S concludes that, while collisions with transmission lines pose a potential risk to Black Rail based on the physical attributes of this species, its "sedentary, non-migratory" nature allows such risk to be discounted. (SWRCB-102, FEIR/S, p. 192-3525; see also FSL-30 and SWRCB-3, Appendix 5.J, Att. 5.J.C.)

1. <u>The California Black Rail Is Not Strictly Sedentary or Non-Migratory</u>

Within the Black Rail species, there is a range of typical behavior depending on a given population's location. A substantial population of California Black Rail was recently found in the Sierra foothills (SOSC-25, Aigner et al. 1995) and has been documented to breed in nearly 200 sites in Butte, Yuba, Nevada, and Placer counties. (SOSC-49, Richmond et al. 2008.) This population is estimated to be comparable in size to the entire San Francisco Bay/Delta population. (SOSC-40, Girard et al. 2010.)

This foothill population is far from sedentary, demonstrated by the fact that black rails will discover and colonize new patches of habitat within a few to several miles of existing populations, often within the first year following establishment of the new habitat. (SOSC-50, Richmond et al. 2010; S. R. Beissinger, pers. comm.) Thus, Black Rails are dispersing widely from existing breeding locations in search of new ones.

Most importantly, genetic analysis shows that there is migration between the Bay Area/Delta population and the foothill population (SOSC-40, Girard et al. 2010), as demonstrated by gene flow between these widely separated populations.

Other Black Rail locations separated from the Bay/Delta have been documented on the Central Valley floor including: White Slough (SOSC-52, San Joaquin Audubon 2002) north of

Lodi (where Black Rails have been found consistently for many years), and two sites south of Sacramento (Cosumnes River Preserve and Stone Lakes National Wildlife Refuge). (SOSC-51, Rottenborn et al. 2016.)

The observation of Trulio and Evens (2000) that some Black Rails nesting in the north San Francisco Bay winter in the south Bay, further demonstrates the non-sedentary nature of at least a portion of this population. (SOSC-55, Trulio and Evens 2000.)

2. Transmission Lines Associated With the Project Pose a Collision Risk to the California Black Rail

The combination of night migration and the physical attributes (high wing loading, low aspect ratio) of Black Rails, makes them highly susceptible to collisions with power lines. (SOSC-34, Bevanger 1998.) The movements of Bay Area/Delta Black Rails to and from the Sierra foothills (as noted above) as well as likely movements between the Bay/Delta and Central Valley floor sites means that birds may move through the project area and face the threat of collisions with the many miles of new transmission lines associated with the project.

3. Recommended Condition to Avoid Take of Black Rail

The only alternative that would eliminate the risk of take of Black Rails from collisions with transmission lines is to place all new lines associated with the project, permanent and temporary, underground. At a minimum, all new AND existing lines could be fitted with bird diverters visible at night (glow-in-the-dark or lighted) when Black Rails migrate. These bird diverters may not be sufficient to eliminate the risk of take.

C. White-tailed Kite

The FEIR/S Alternative 4a relies almost entirely on mitigation and environmental commitments intended to benefit Swainson's Hawk to mitigate threats to the White-tailed Kite. (See SWRCB-102, FEIR/S, pp. 12-3615 to 12-3624 [avoidance and minimization measures purported to apply to White-tail Kite].) This analysis is problematic given key differences between the two species.

1. There are Fundamental Differences Between Swainson's Hawk and White-tailed Kite Habitats

While there is significant overlap between preferred foraging habitats of Swainson's Hawk and White-tailed Kite (both species commonly forage in alfalfa, irrigated pasture, grassland, and hay fields), there are also significant differences.

These two species require very different grassland conditions for foraging. Swainson's Hawk use well-grazed grassland with low vegetative cover (SOSC-32, Bechard 1982; SOSC-39, Estep 1989; SOSC-33, Bechard et al. 2010), while White-tailed Kites prefer ungrazed, relatively over-grown grassland. (~~SOSC-29,~~ Bammann 1975; ~~SOSC-37,~~ Dunk 1995; SOSC-47, Pandolfino et al. 2011.) Pandolfino et al. (2011) (SOSC-47) found White-tailed Kites present in ungrazed grassland in densities five times greater than in grazed grassland. Therefore, grasslands managed for Swainson's Hawk would not be nearly as valuable for White-tailed Kite.

White-tailed Kites were found most strongly-associated with wetland of all habitat types in the Central Valley in winter. (SOSC-47, Pandolfino et al. 2011.) Swainson's Hawks make relatively little use of wetlands. (SOSC-39, Estep 1989; SOSC-33, Bechard et al. 2010.)

Much of the mitigation for Swainson's Hawk would be in cultivated crops such as sugar beets and tomatoes. While these crops are used by White-tailed Kites in spring and summer (SOSC-39, Estep 1989; ~~SOSC-38,~~ Erichsen et al. 1996), these fields are typically plowed dirt in winter (when Swainson's Hawks are absent but White-tailed Kites remain), and are a habitat avoided by White-tailed Kites in winter. (SOSC-47, Pandolfino et al. 2011.)

CDFW's incidental take permit for Swainson's Hawk requires significant protection/restoration of alfalfa as a high-quality foraging substrate. (SWRCB-107, CDFW Incidental Take Permit, p. 111.) Alfalfa is also frequently used by White-tailed Kites. (SOSC-39, Estep 1989; SOSC-33, Bechard et al. 2010; SOSC-47, Pandolfino et al. 2011.) However, there is no clear mechanism or budget that would insure that lands preserved as agriculture would continue to plant alfalfa, regardless of the potential to switch to other, higher income, crops.

It is also uncertain when preserved/restored habitats will be available. If there is a significant lag between impacts on key habitats and restoration, take of White-tailed Kites may occur. This is a particular risk for this species given its relatively sedentary nature and reluctance to move to new areas. (SOSC-54, Stendell & Myers 1973; ~~SOSC-37, Dunk 1995~~.)

White-tailed Kites are frequently the target of aggressive attacks from larger raptors. Such attacks include physical contact (SOSC-48, Pinkston & Caraviotis 1980; SOSC-41, Heredia and Clark 1984; SOSC-28, Baladron & Pretelli 2013), stealing of prey (SOSC-41, Heredia & Clark 1984; SOSC-28, Baladron & Pretelli 2013), and even predation. (SOSC-48, Pinkston & Caraviotis 1980.) Thus, even in areas with high habitat quality for both the kite and Swainson's Hawk, the larger Swainson's Hawk may persecute the smaller (less than ½ in weight) Kite and compete for prey. (SOSC-53, Sibley 2014.)

2. Recommended Condition of Approval

To reduce the risk of take of the White-tailed Kite, I recommend the following:

(a) Adequate areas of high quality foraging habitat would need to be retained/created within 1 km of potential nesting sites;

(b) Additional grassland would need to be conserved and managed for White-tailed Kite (ungrazed or very lightly grazed);

(c) A clear, enforceable, well-funded requirement for agricultural habitats to be maintained in high quality (alfalfa, in particular) must be included; and

(d) Restoration and preservation of foraging and nesting habitats must occur before impacts occur.

III. CONCLUSION

The project as described would result in unreasonable impacts to avian wildlife. Take of Greater Sandhill Crane is certain, take of California Black Rail is likely, and take of

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White-tailed Kite is possible. Take of any of these Fully-protected Species would be contrary to the public interest.

Executed on the 30th day of November, 2017, at Sacramento, California.

Ed Pandolfino

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