From: Wilkinson, Chris@DWR <Christopher.Wilkinson@water.ca.gov>
Sent: Tuesday, February 26, 2019 11:12 AM
To: Kristin Begun - NOAA Affiliate; 'Garwin.Yip@noaa.gov'; Bradley, Mark@DWR; Reeve, Matthew@DWR; Pacheco, Victor@DWR; Jacobs, Brooke@Wildlife; Brumbaugh, Steven@DWR; Katherine Sun; Halston, Armin A; Affonso, Jana @FWS; Kollmar, Vanessa@Wildlife; Barbara Byrne - NOAA Federal
Subject: FW: CCF Predator Management in ROC BA

For our discussion

Chris Wilkinson
o (916) 376-9704
c (916) 494-1490

From: J. Stuart - NOAA Federal <j.stuart@noaa.gov>
Sent: Tuesday, February 26, 2019 11:04 AM
To: Wilkinson, Chris@DWR <Christopher.Wilkinson@water.ca.gov>
Subject: Re: CCF Predator Management in ROC BA

Here are some directed questions from NMFS

On Mon, Feb 25, 2019 at 3:43 PM Wilkinson, Chris@DWR <Christopher.Wilkinson@water.ca.gov> wrote:

> Meeting purpose: Provide clarification on DWR's Clifton Court Forebay Predator Management actions in the ROC on LTO Biological Assessment.
>
> NMFS has requested details on DWR's CCF Predator Management actions as part of their review of the ROC on LTO BA. The BA excerpts below indicate how the "Clifton Court Predator Management" (Site-specific) actions are currently covered in the BA, along with excerpts for "Skinner Fish Facility Improvements" (Programmatic). The focus of the discussion will be providing details on the Clifton Court Predator Management (Site-specific) action.
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Chapter 4. Proposed Action

Table 4-6. Components of the Proposed Action (pp. 4-21 to 4-24)

Operations		
Clifton Court Predator Management*	Site-specific	Core
Facility Improvements		
Skinner Fish Facility Improvements*	Programmatic	AM

- *Skinner Fish Facility Improvements:* DWR would continue implementation of projects to reduce mortality of ESA-listed fish species. These measures that would be implemented include: (a) electro-shocking and relocating predators; (b) controlling aquatic weeds; (c) developing a fishing incentives or reward program for predators; and (d) operational changes when listed species are present. Please see Appendix G, *Clifton Court Forebay Predation Studies* for study results from the last decade. (p 4-57)

Chapter 5. Effects

5.6.4.12 Clifton Court Predator Management (p. 5-71)

Clifton Court predator management efforts could predation on listed fishes following entrainment into CCF, reducing pre-screen loss.

5.8.4.15 Clifton Court Predator Management (p. 5-163)

Predator control efforts at Clifton Court Forebay under the proposed action could reduce pre-screen loss of juvenile Spring-run Chinook Salmon entrained into Clifton Court Forebay. Spring-run Chinook Salmon are unlikely to be in the area during predator control efforts during the summer in-water work window.

5.8.4.23 Skinner Fish Facility Improvements (p. 5-165)

Predator control efforts at Skinner Fish Facility under the Proposed Action to reduce predation on listed fishes following entrainment into Clifton Court Forebay could reduce pre-screen loss of juvenile Spring-run Chinook Salmon entrained into Clifton Court Forebay. Spring-run Chinook Salmon are unlikely to be in the area during predator control efforts.

5.10.4.14 Clifton Court Predator Management (p. 5-222)

Clifton Court predator management under the proposed action could reduce pre-screen loss of juvenile CV Steelhead entrained into CCF; therefore, providing a benefit for all life stages of CV Steelhead.

5.12.4.10 Clifton Court Predator Management (p. 5-283)

Predator control efforts under the proposed action can reduce predation on listed fish species, following their entrainment into Clifton Court Forebay. This could also reduce pre-screen loss of juvenile southern DPS Green Sturgeon. It is unknown what proportion of juvenile Green Sturgeon are entrained into CCF but individuals are salvaged infrequently.

5.12.4.17 Skinner Fish Facility Improvements (p. 5-285)

Skinner Fish Facility improvements under the proposed action, which involve predator control efforts, can reduce predation on listed fish species, following their entrainment into Clifton Court Forebay. This could also reduce pre-screen loss of juvenile southern DPS Green Sturgeon. It is unknown what proportion of juvenile Green Sturgeon are entrained into CCF but individuals are salvaged infrequently. Thus, the proposed action is not likely to negatively impact juvenile Green Sturgeon.

5.14.5.5.14 Clifton Court Predator Management (p. 5-364)

Predator control efforts in Clifton Court Forebay under the proposed action could reduce pre-screen loss of juvenile Fall-run Chinook Salmon entrained into Clifton Court Forebay. Larger proportions of Late Fall-run Chinook Salmon are lost at the facilities and this action would have a larger beneficial effect for this run.

5.14.5.5.22 Skinner Fish Facility Improvements (p. 5-366)

Skinner fish facility improvements from predator control efforts to reduce predation following entrainment into Clifton Court Forebay could reduce pre-screen loss of Fall-run/Late Fall-run juvenile Chinook Salmon entrained into Clifton Cout Forebay. However, only small proportions of Fall-run Chinook Salmon are lost at the SWP (Zeug and Cavallo 2014).

Larger proportions of Late Fall-run Chinook Salmon are lost at the facilities and this action would have a larger effect for this run.

5.16.4.3 Clifton Court Predator Removal (p. 5-423)

Predator control efforts under the proposed action to reduce predation on listed fishes following entrainment into Clifton Court Forebay could reduce salvage-related loss of adult Delta Smelt. Entrainment risk under the proposed action would be managed to limit the potential for adult Delta Smelt to occur in the south Delta and be entrained. Depending on the gear type of Clifton Court predator control efforts, predator control efforts may also catch Delta Smelt (that would likely have been salvaged or lost).

5.16.4.3.1 Eggs and Larvae to Juveniles (March - June)

Depending on the geartype of Clifton Court predator control efforts, predator control efforts under the proposed action may also catch Delta Smelt that would likely have been salvaged or lost.

5.16.4.10 Skinner Fish Facility Operations and Improvements (p. 5-433 to 5-434)

5.16.4.10.1 Adults to Eggs and Larvae (December - May)

Skinner fish facility improvements from predator control efforts under the proposed action to reduce predation on listed fishes following entrainment into CCF could reduce salvage-related loss of adult Delta Smelt. However, entrainment risk under the proposed action would be managed to limit the potential for adult Delta Smelt to occur in the south Delta and be entrained. Depending on the gear type of Clifton Court predator control efforts, predator control efforts may also catch Delta Smelt that would likely have been salvaged or lost).

5.16.4.10.2 Eggs and Larvae to Juveniles (March - June)

Larval Delta Smelt are unlikely to be salvaged and therefore the Skinner Fish Facility improvements under the proposed action would have no effects on this life stage. Depending on the gear type of Clifton Court predator control efforts, predator control efforts may also catch Delta Smelt that would likely have been salvaged or lost.

5.16.4.10.3 Juveniles to Subadults (June-September); Subadults to Adults (September - December)

Juvenile and subadult Delta Smelt do not occur in the south Delta (Figure 5.16-1) and therefore there would be no effects from Skinner Fish Facility improvements under the proposed action on this life stage. Depending on the gear type of Clifton Court predator control efforts, predator control efforts may also catch Delta Smelt that would likely have been salvaged or lost.

Appendix A. Facility Descriptions

A.5.3.1.2.2 Clifton Court Forebay Predation Studies (p. A-104)

DWR has conducted the following studies on predation at Clifton Court Forebay:

- Clifton Court Forebay Predation Study Project Report (DWR 2010a)
- 2013 CCF Predation Study Annual Progress Report (DWR 2015b)
- 2014 CCF Predation Study Annual Progress Report (DWR 2016a)

- 2015 CCF Predation Study Annual Progress Report (DWR 2017a)
- 2016 CCF Predation Study Annual Progress Report (DWR 2018as)
- Quantification of Pre-Screen Loss of Juvenile Steelhead in Clifton Court Forebay (DWR 2009)
- 2007-2008 Fish Release Site Predation Study ("CHTR Element 2") Report
- 2016 CCF Predator Reduction Electrofishing Study Annual Report (DWR 2016b)
- 2017 CCF Predator Reduction Electrofishing Study Annual Report (DWR 2017b)
- 2018 CCF Predator Reduction Electrofishing Study Annual Report (DWR 2018at)

A.5.3.1.2.3 Proposed Measures to Reduce Mortality of ESA-Listed Fish Species

DWR plans to continue implementation of projects to reduce mortality of ESA listed fish species in response to the National Marine Fisheries Service (NMFS) letter dated April 9, 2015, requiring that the California Department of Water Resources (DWR) immediately implement interim measures to improve predator control until an acceptable alternative can be implemented. These interim measures that could be implemented include: (a) electro-shocking and relocating predators; (b) controlling aquatic weeds; (c) developing a fishing incentives or reward program for predators; and (d) operational changes when listed species are present.

DWR recently completed work at the Curtis Landing Fish Release Site, the Fish Science Building and Warehouse, and two new fish release sites as part of its ongoing efforts to improve the survival of ESA listed and other Delta fish species.

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