State of California Department of Fish and Wildlife

Memorandum

Date: November 9, 2020

To: Sarah Mussulman

Senior Environmental Scientist; Supervisor

Department of Fish and Wildlife

North Central Region

1701 Nimbus Road, Suite A Rancho Cordova, CA 95670

Cc: CDFW North Central Region Fish Files

From: Mitch Lockhart; Environmental Scientist, &

Luc Mitchell; Scientific Aide Department of Fish and Wildlife 1701 Nimbus Road, Suite A Rancho Cordova, CA 95670

Subject: Pre-Stocking Evaluation at Meadow Lake, Nevada County.

Meadow Lake (Lake ID: 12636), Nevada County, is a popular drive-to destination accessible by vehicles with high clearance (**Figures 1 & 2**) via Jackson Meadows Road

and Meadow Lake Road. It is impounded by a 38-foot-tall earthen fill dam owned and operated by Pacific Gas & Electric Company (PG&E) as part of the Drum-Spaulding Hydroelectric Project (FERC# 2310). The California Department of Fish and Wildlife (CDFW) has been planting Lahontan Cutthroat Trout (Oncorhynchus clarki henshawi; LCT), Rainbow Trout (Oncorhynchus mykiss; RT) and Brook Trout (Salvelinus fontinalis; BK) in Meadow Lake since 1938. The lake was most recently stocked with LCT in 2013.

To assess the current status of the



Figure 1. Map of Meadow Lake, Nevada Co., in relation to Lake Tahoe and Truckee, CA. Meadow Lake is highlighted in cyan (CDFW BIOS Viewer, retrieved 8.24.20).



Figure 2. Google Earth overview image of Meadow Lake, Nevada County (Retrieved 08.24.2020).

sport fishery at Meadow Lake and determine if continued fish plants are warranted, two CDFW Scientific Aides surveyed Meadow Lake on July 27 and July 28, 2020.

A monofilament gill net was set from the shore on the west side of Meadow Lake on July 27, 2020 at 9:10 pm and was pulled the following morning at 6:17 am for a survey effort of 9 hours. Thirty Brown Bullhead (*Ameiurus nebulosus*; BB) were captured in the gill net. The second gill net was set near the outlet dam on July 28, 2020 at 12:56 pm and was pulled later that same day at 5:04 pm for a survey effort of 4 hours. No fish were present in the second gill net. Meadow Lake is approximately 232 surface acres, and more gill nets would need to be set for a complete assessment of the fishery. It should also be noted that the water level was drawn down 20 to 30 feet

from the visible shore banks (Figure 3).

Scientific Aides conducted a visual encounter survey (VES) of Meadow Lake on July 27, 2020, searching for diurnal herpetofauna such as the Federally Endangered Sierra Nevada Yellow-legged Frog (*Rana sierrae*, SNYLF). During the survey, the air temperature was 19 degrees Celsius under partly cloudy skies. The results of the VES at Meadow Lake are summarized in **Table 1**. Pacific Chorus Frog (*Pseudacris regilla*; PSRE) and Western Toad (*Anaxyrus boreas*; ANBO) tadpoles were present. Additionally, a single Sierra Gartersnake (*Thamnophis couchii*; THCO) adult was seen during the survey. Thousands of juvenile BB and seven dead adult BB were also seen



Figure 3. Panoramic photograph of drawn down shoreline at Meadow Lake, Nevada County. The photograph was taken from the north-west corner of the lake, facing south-east (CDFW, July 28, 2020).

Table 1. VES observations at Meadow Lake on July 27, 2020.

Species	Adults	Tadpoles
PSRE	-	23
ANBO	-	7
THCO	1	-

in the shallows during the VES. Meadow Lake was the site of a historic hard rock mining city, and it is likely that BB were a food source during those times.

Gill net data collected in 2020 show Meadow Lake does not currently support a sport fishery. Despite historic CDFW plants of multiple species of trout, trout do not persist and are clearly not able to naturally reproduce within Meadow Lake. The only persistent wild fish population present at Meadow Lake is a very dense population of BB, despite having never been planted by CDFW.

Meadow Lake has not been stocked by CDFW since 2013 (**Table 2**). The last stocking event included 5,000 aerially planted fingerling LCT, or 22 fish per surface acre of Meadow Lake. A more appropriate ratio for a lake this size is 100 fish per surface acre, or 23,000 fingerlings. Gillnet data collected in 2014 show that LCT were able to grow to trophy size with an allotment of 5,000 fingerlings, however it is clear that active plants are necessary for the lake to remain a sport fishery (Kundargi 2014). This is problematic because LCT hatchery production varies from year-to-year and allotments are frequently not met or fulfilled. For example, Meadow Lake has been allotted 5,000 fingerling LCT annually since 2009 but has been planted only four times in that 12-year period.

Table 2. CDFW stocking history for Meadow Lake, Nevada County from 2009 to 2020.

		Number of Fish	
Year	Species	Planted	Size
2009	LCT	5,000	Fingerling
2010	LCT	5,000	Fingerling
2012	LCT	5,000	Fingerling
2013	LCT	5,000	Fingerling

For Meadow Lake to serve as a put-and-grow recreational LCT fishery, LCT must survive and persist in Meadow Lake between intermittent stocking events. It is clear that 5,000 fish per stocking event is not sufficient for the fishery to persist over a 6-year period. As a result, Meadow Lake should be planted with at least 20,000 LCT fingerlings annually.

Alternatively, CDFW could plant RT instead of LCT. CDFW hatchery production for RT is much more consistent compared to LCT. RT allotments at Meadow Lake may yield more consistent trout plants over the long term to facilitate the put-and-grow strategy of

the sport fishery at Meadow Lake. Due to the findings of this survey, we recommend changing the allotment at Meadow Lake from LCT to RT fingerlings. Monitoring surveys should be conducted annually one to three years after planting to track survivorship and growth.

Literature Cited

Kundargi, K. Meadow Lake Gillnet Survey April 17-18, 2014. R2 Fish. CDFW; 7/11/2014. [Cited 2020 September 4]. Available from: http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=89028

Trout: ra	inbow trout (RT), golden trout (GT),	outthroat trout (CT),	brown tr	out (BN),	brook trout (BK), hybrids	(GT x RT, C	T x RT)		DATE: 7-130/20	10
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Figure 4. Data Sheet with gill net data from a survey conducted July 27, 2020, at Meadow Lake, Nevada County.

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Figure 5. Data Sheet with VES data from a survey conducted July 27, 2020, at Meadow Lake, Nevada County.

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	alling? Y N	OUT (circle one)	#		1000		Ĭ					_		
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	alling? Y N alling? Y N	OUT (tircle cne) IN OUT (tircle one) IN										Aural	Hand Colle	cied
SISH SPECIES (dircle species seen, if known): BK (broak trout), BN (broak trout), CT (authrost trout), GT (golden trout), RT (reinbow trout) HYBRID (e.g., GT x RT), OTHER (e.g., T x RT), OTHER (e.g.	alling? Y N alling? Y N alling? Y N	OUT (circle one) IN OUT (circle one) IN OUT	#				34					Aural Amp Net	Hand Colle Incidental	nenen
Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA, fimity BUCA); Sieman Treefrog (HYSI, fimity PSRE or HYRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity PSRE); Siema Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity Toed); Sieman Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity Toed); Sieman Treefrog (HYSI, fimity Toed); Sieman Nevada Yellow-legged Frog (Amphibians: S. Long-loed Salamander (AMMA); Yosemite Toed (ANCA); Sieman Treefrog (HYSI, fimity Toed); Sieman Nevada Yellow-legged Frog (Amphibians); Sieman Nevada Yellow-legge	alling? Y N alling? Y N alling? Y N alling? Y N	OUT (circle one) IN OUT (circle one) IN OUT (circle species	# aeen, if known									Aural Amp Net (RT), OTHER	Hand Colle Incidental (e.g., minnow	rs)
Amph. less common in HML; CA Toad (ANBO, firmly BUBO); Bullfrog (RACT); Cascades Frog (RACA); CA Red-legged Frog (RADR); Sierra Newt (TASI, firmly TATO) Reptiles: Sierra Gartersnake (THCO); Mountain Gartersnake (THEL); Valley Gartersnake (THSI); Western Pond Turtle (EMMA, firmly CLMA)	alling? Y N SH SPECIES Amphibian	OUT (circle one) IN OUT (circle one) IN OUT (circle species	# seen, If known Salamander (A	AMMA); Yosen	nite Toad (ANCA	frmly BUC	A); Sierran Tr	reefrog (HYSI, fr	mly PSRE or	HYRE); Sie	rra Nevada Y	Aural Amp Net RT), OTHER ellow-legged	Hand Colle Incidental (e.g., minnow Frog (RASI)	rs)

Figure 5, Cont'. Data Sheet with VES data from a survey conducted July 27, 2020 at Meadow Lake, Nevada County.