

State of California
Department of Fish and Wildlife

Memorandum

Date: November 9, 2020

To: Sarah Mussulman
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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
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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

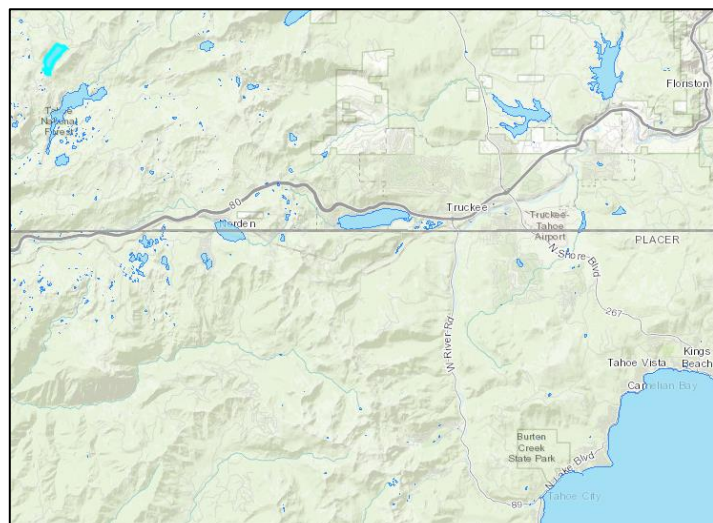


Figure 1. Map of Meadow Lake, Nevada Co., in relation to Lake Tahoe and Truckee, CA. Meadow Lake is highlighted in cyan (CDFW BIOS Viewer, retrieved 8.24.20).



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.

<i>Species</i>	<i>Adults</i>	<i>Tadpoles</i>
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.

<i>Year</i>	<i>Species</i>	<i>Number of Fish</i>	
		<i>Planted</i>	<i>Size</i>
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>

FISH SURVEYING

Trout: rainbow trout (RT), golden trout (GT), cutthroat trout (CT), brown trout (BN), brook trout (BK), hybrids (GT x RT, CT x RT)										DATE: 7/30/2020	
Site Name (if available): Meadow Lake A				Survey Crew: LTM, JTS				Net depth (m): 1.8			
SITE ID: 12636 A		Fish Survey Method: (circle one) gill net hook and line e-fish			Net Location (UTM NAD 83) E: 0715163 N: 4365290			Fish captured? (circle one) (Y) (insert data below) N			
Gill Net near inlet near outlet		General location (circle one): other		Net Set Date: 7/27/2020		Net set time (hhmm): 2110		Net Pull Date: 7/28/2020		Net pull time (hhmm): 0617	
Electrofishing		Location: (inlet or outlet #)		Start coord. (downstream) E N		End coord. (upstream) E N		Start (hhmm):		End (hhmm):	
E-fisher Settings (if needed):				Volts: --		Hz: --		Duty Cycle: --		Pulse: --	
										Other: --	
Fish #	Species	Tot. Lgth (mm)	Weight (g)	Sex	Egg Stage (F only) Early Ripe Late			Otoliths?	Comments		
1	BB	-	-	-	-	-	-	-	+29 Brown Bullhead		
2											
3											
4											
5											
6											
7											
8											
9											
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Data Sheet 2, pg. 1 of 2

Figure 4. Data Sheet with gill net data from a survey conducted July 27, 2020, at Meadow Lake, Nevada County.

CDFW High Mountain Lakes - Amphibian and Reptile Visual Encounter Survey Data Sheet

Site ID: 12636	Date: 7/27/2020	SKY: Clear <u>Partly Cloudy</u> Mostly Over-Cloudy Rain Snow Smoke	WIND: Calm <u>Light</u> Moderate Strong
Topo Name: Meadow Lake	County: Nevada	Elevation: m ft	If not surveyed, provide reason: Private Property Frozen Not Found No Access
Surveyors: LTM, JTS	Water Type: <u>Lake</u> Unmapped pond Marsh/ meadow Spring seep	Stream (Skip to "STREAMS" on pg. 2)	
Lake Name: Meadow Lake	East UTM: 0715163	North UTM: 4365290	UTM Zone: 10
Color: <u>Clear</u> Stained	Water (5 m from shore, Temp 10cm deep): 23 @ 1730	Air (1 m above water): 19 @ 1728	Seasonality: <u>Perennial</u> Ephemeral
Turbidity: <u>Clear</u> Cloudy			Currently Dry? Yes <u>No</u>
Survey START time: 1642	Survey END time: 1700	Total survey duration (min): 36	HERPS SEEN? <u>YES</u> NO FISH SEEN? <u>YES</u> NO

***FOR LAKES/PONDS/MEADOWS: ALSO SURVEY FIRST 200 m OF INLETS AND OUTLETS. RECORD DATA SEPARATELY IN THE "STREAMS" SECTION ON PG. 2**

HERP SPECIES	# adults	# subadults	# metamorphs	# larvae	# egg m.	# swabs	Survey Method
PSRE				23			<u>Visual</u> Trapped
Calling? Y (N)							<u>Aural</u> Hand Collected
ANBO				7			<u>Amp Net</u> Incidental
Calling? Y (N)							<u>Visual</u> Trapped
THLO	1						<u>Aural</u> Hand Collected
Calling? Y (N)							<u>Amp Net</u> Incidental
							<u>Visual</u> Trapped
Calling? Y N							<u>Aural</u> Hand Collected
							<u>Amp Net</u> Incidental
Calling? Y N							<u>Visual</u> Trapped
							<u>Aural</u> Hand Collected
							<u>Amp Net</u> Incidental

FISH SPECIES (circle species seen, if known) BK (brook trout), BN (brown trout), GT (cutthroat trout), GT (golden trout), RT (rainbow trout) HYBRID (e.g., GT x RT), OTHER (e.g., minnows)

Amphibians: S. Long-toed Salamander (AMMA); Yosemite Toad (ANCA, family BUCA); Sierran Treefrog (HYSI, family PSRE or HYRE); Sierra Nevada Yellow-legged Frog (RASI)
Amph. less common in HML: CA Toad (ANBO, family BUFO); Bullfrog (RACT); Cascades Frog (RACA); CA Red-legged Frog (RADR); Sierra Newt (TASI, family TATO)
Reptiles: Sierra Gartersnake (THCO); Mountain Gartersnake (THEL); Valley Gartersnake (THSI); Western Pond Turtle (EMMA, family CLMA)

PHOTOS	Photo Number	Camera	Time	Date (yyyy-mm-dd)	UTM E	UTM N	Comments
Overview	1436	LTM	1436	2020-Jul-28	-	-	overview photo
Herps							
Other							

<p>SITE SKETCH:</p>	<p>NOTES:</p> <p>Brown Bullhead Present. 7 dead adult along shore during VES.</p> <p>Biggest Bald Eagle ever seen by human eyes - codename "Deer-killer"</p>
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Herp Data Sheet, pg. 1 of 2

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

STREAM									
Inlet (circle one) # 1		Stream Type: Perennial		Ephemeral		Stream Currently Dry? <input checked="" type="radio"/> Y <input type="radio"/> N		Intermittent? <input checked="" type="radio"/> Y <input type="radio"/> N	
Start UTM E: 0715321		UTM N: 4364557		End UTM E: 0715417		UTM N: 4364391		Color: Clear Stained <input checked="" type="radio"/> NA	
Start Time: 1310		End Time: 1318		Duration (min): 8		Water Temp: -		Air Temp: -	
BARRIERS (fill out info below)									
Fish present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 1	Photo #'s:	UTM E:		UTM N:			
Herps present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 2	Photo #'s:	UTM E:		UTM N:			
Spawning evidence?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 3	Photo #'s:	UTM E:		UTM N:			
Spawning / Redds / Fry / None									
Inlet (circle one) # 1		Stream Type: Perennial		Ephemeral		Stream Currently Dry? <input checked="" type="radio"/> Y <input type="radio"/> N		Intermittent? <input checked="" type="radio"/> Y <input type="radio"/> N	
Start UTM E: 0715127		UTM N: 4364804		End UTM E: 0715009		UTM N: 4364951		Color: Clear Stained <input checked="" type="radio"/> NA	
Start Time: 1339		End Time: 1344		Duration (min): 5		Water Temp: -		Air Temp: -	
BARRIERS (fill out info below)									
Fish present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 1	Photo #'s:	UTM E:		UTM N:			
Herps present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 2	Photo #'s:	UTM E:		UTM N:			
Spawning evidence?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 3	Photo #'s:	UTM E:		UTM N:			
Spawning / Redds / Fry / None									
Inlet (circle one) # 2		Stream Type: Perennial		Ephemeral		Stream Currently Dry? <input checked="" type="radio"/> Y <input type="radio"/> N		Intermittent? <input checked="" type="radio"/> Y <input type="radio"/> N	
Start UTM E: 0715430		UTM N: 4365788		End UTM E: 0715315		UTM N: 4365867		Color: Clear Stained <input checked="" type="radio"/> NA	
Start Time: 1422		End Time: 1425		Duration (min): 3		Water Temp: -		Air Temp: -	
BARRIERS (fill out info below)									
Fish present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 1	Photo #'s:	UTM E:		UTM N:			
Herps present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 2	Photo #'s:	UTM E:		UTM N:			
Spawning evidence?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 3	Photo #'s:	UTM E:		UTM N:			
Spawning / Redds / Fry / None									
Inlet (circle one) # 3		Stream Type: Perennial		Ephemeral		Stream Currently Dry? <input checked="" type="radio"/> Y <input type="radio"/> N		Intermittent? <input checked="" type="radio"/> Y <input type="radio"/> N	
Start UTM E: 0715679		UTM N: 4366116		End UTM E: 0715573		UTM N: 4366179		Color: Clear Stained <input checked="" type="radio"/> NA	
Start Time: 1447		End Time: 1450		Duration (min): 3		Water Temp: -		Air Temp: -	
BARRIERS (fill out info below)									
Fish present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 1	Photo #'s:	UTM E:		UTM N:			
Herps present?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 2	Photo #'s:	UTM E:		UTM N:			
Spawning evidence?	<input checked="" type="radio"/> Y <input type="radio"/> N	Barrier 3	Photo #'s:	UTM E:		UTM N:			
Spawning / Redds / Fry / None									
HERP SPECIES	In/Outlet #	# adults	# subadults	# metamorphs	larvae	# egg m.	# swabs	Survey Method	
Calling? Y N	(circle one) IN							Visual Trapped	
	(circle one) OUT							Aural Hand Collected	
	(circle one) IN							Amp Net Incidental	
	(circle one) OUT							Visual Trapped	
	(circle one) IN							Aural Hand Collected	
	(circle one) OUT							Amp Net Incidental	
Calling? Y N	(circle one) IN							Visual Trapped	
	(circle one) OUT							Aural Hand Collected	
	(circle one) IN							Amp Net Incidental	
	(circle one) OUT							Visual Trapped	
	(circle one) IN							Aural Hand Collected	
	(circle one) OUT							Amp Net Incidental	

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