

**State of California
Department of Fish and Wildlife**

Memorandum

Date: October 29, 2019

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Cc: CDFW North Central Region Fish Files

From: Mitch Lockhart; Environmental Scientist
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Subject: Resource Assessment at Warren Lake, Nevada County

Warren Lake (Lake ID 12847), Nevada County, is a backcountry destination northwest of Truckee, CA, and seven miles from the Pacific Crest Trail at Donner Summit (**Figures 1 & 2**). The lake is the headwaters to North Fork Prosser Creek, a tributary to Prosser Creek Reservoir and the Truckee River. Historically, Warren Lake was aerially planted by California Department of Fish and Wildlife (CDFW) with brook trout (*Salvelinus fontinalis*; BK) from 1951 until 1966. Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*; LCT) were planted from 1967 until 2000.

To determine the status of the fishery at Warren Lake and if further fish plants were warranted, the lake was surveyed by two CDFW Scientific Aids from September 10, 2019 to September 11, 2019. A monofilament gill net was set at 7:51 pm on September 10, 2019 and was pulled the following morning on September 11, 2019 at 6:45 am for a total survey effort of approximately 11 hours. The gill net catch included BK, Lahontan red-side (*Richardsonius egregius*; LRS), and a single LCT (**Table 1**).

The Scientific Aids also conducted a Visual Encounter Survey (VES) of the entire lake on September 11, 2019 searching for diurnal herpetofauna. The VES began at 10:15 am under clear skies, calm wind, and an air temperature of 7.5° C. The survey continued until 11:22 am for a total survey effort of 103 minutes. No herpetofauna were observed.

The presence of BK presents a challenge for management of LCT. While there was one LCT present in the sample (**Figure 3**), the abundance of BK suggest that they outcompete the LCT. That any LCT were found after 19 years after the last known stocking event suggests that LCT can naturally reproduce. However, these data are insufficient to determine if LCT reproduction is sufficient for long-term population sustainability.

If LCT are to persist in Warren Lake, the limited data presented here suggest the lake should be planted with LCT fingerlings. Repeat plants over the course of several years is warranted, given the presence of BK.

However, aerially planting Warren Lake is confounded by the presence of two nearby Sierra Nevada yellow-legged frog populations (*Rana sierrae*; SNYLF) at Paradise Lake to the west, and Coon Canyon to the south. Planting Warren Lake does pose the small risk of mis-planting fish into SNYLF-bearing habitat.

Finally, the air temperatures at Warren Lake were very cold, well below the preferred temperature for herpetofauna surveys. As a result, the VES observations may not accurately reflect herpetofauna inventory at Warren Lake and should be repeated before the lake is approved for aerial trout plants.

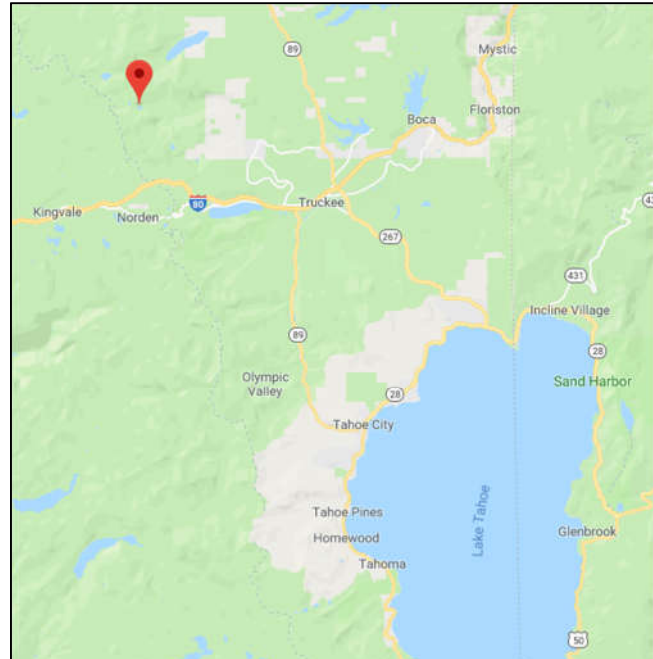


Figure 1: Map of Warren Lake, Nevada Co., (Red Pin) in relation to Lake Tahoe and Truckee, CA (Google Maps, retrieved 10.14.19).



Figure 2: Overview photo of Warren Lake, Nevada Co., looking approximately north east (Sept. 2019).



Figure 3: Photograph of the single LCT captured during a gill net survey of Warren Lake, Nevada Co., on Sept. 11, 2019. The fish was released alive.

Table 1: Total length, weight, sex, and egg stage of fish captured during a gill net survey at Warren Lake, Nevada Co., on Sept. 11, 2019.

Species	Length (mm)	Weight (g)	Sex (F/M)	Egg Stage
LCT	520	1000+	-	-
BK	410	700	-	-
BK	405	690	-	-
BK	498	690	F	Early
BK	367	495	F	Early
BK	363	490	F	Early
BK	375	550	F	Early
BK	381	530	M	-
BK	352	410	M	-
BK	340	370	F	Early
BK	320	340	F	Early
BK	260	200	M	-

GILLNET SURVEY DATA SHEET

Date 9/10/19-9/11/19 Water Warren Lake Sampler(s) L. Mitchem, C. Hettrick

SET TIME 9/10/19: 1951 PULL TIME 9/11/19: 0645 WATER TEMP (9/10) 17°C; (9/11) 16°C

UTM Latitude 10S 0727884.4363953 Longitude _____

Species	BK		Sex	EGG	LCT		Sex	EGG	LRS		Count
	Length TL (mm)	Weight (gm)			Length TL (mm)	Weight (gm)			Length TL (mm)	Weight (gm)	
1	410	700	-	-	520	1000+	-	-			
2	465	690									
3	498	690	F	E							
4	367	445	F	E							
5	363	490	F	E							
6	375	550	F	E							
7	381	530	M	-							
8	352	410	M	-							
9	340	370	F	E							
10	320	340	F	E							
11	260	200	M	-							
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Figure 4: Data sheet with gill net data from a survey conducted Sept. 11, 2019, at Warren Lake, Nevada County.

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

Site ID:	Date:	SKY: <input checked="" type="radio"/> Clear <input type="radio"/> Partly Cloudy <input type="radio"/> Mostly Over-Cloudy <input type="radio"/> Rain <input type="radio"/> Snow <input type="radio"/> Smoke	WIND: <input checked="" type="radio"/> Calm <input type="radio"/> Light <input type="radio"/> Moderate <input type="radio"/> Strong					
Topo Name: (1:24,000)	County:	Elevation: m ft	If not surveyed, provide reason:		Private Property	Frozen	Not Found	No Access
Surveyors: <i>C. Hoxtersak & L. Mitchell</i>		Water Type:		<input checked="" type="radio"/> Lake <input type="radio"/> Unmapped pond <input type="radio"/> Marsh/meadow <input type="radio"/> Spring seep	Stream (Skip to "STREAMS" on pg. 2)			
Lake Name: (from map)	East UTM:	North UTM:		UTM Zone:				
Color: <input checked="" type="radio"/> Clear <input type="radio"/> Stained	Turbidity: <input checked="" type="radio"/> Clear <input type="radio"/> Cloudy	Water (.5 m from shore, Temp 10cm deep):	<i>110 @ 1000</i>	Air (1 m above water):	<i>7.5 @ 1000</i>	Seasonality: <input checked="" type="radio"/> Perennial <input type="radio"/> Ephemeral	Currently Dry? <input type="radio"/> Yes <input checked="" type="radio"/> No	
Survey START time:	Survey END time:	Total survey duration (min):	HERPS SEEN? <input checked="" type="radio"/> YES <input type="radio"/> NO	FISH SEEN? <input checked="" type="radio"/> YES <input type="radio"/> 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	# eggs	# swabs	Survey Method	
Calling? Y N							<input checked="" type="radio"/> Visual <input type="radio"/> Aural <input type="radio"/> Amp Net	<input checked="" type="radio"/> Trapped <input type="radio"/> Hand Collected <input type="radio"/> Incidental
Calling? Y N							<input checked="" type="radio"/> Visual <input type="radio"/> Aural <input type="radio"/> Amp Net	<input checked="" type="radio"/> Trapped <input type="radio"/> Hand Collected <input type="radio"/> Incidental
Calling? Y N							<input checked="" type="radio"/> Visual <input type="radio"/> Aural <input type="radio"/> Amp Net	<input checked="" type="radio"/> Trapped <input type="radio"/> Hand Collected <input type="radio"/> Incidental
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Calling? Y N							<input checked="" type="radio"/> Visual <input type="radio"/> Aural <input type="radio"/> Amp Net	<input checked="" type="radio"/> Trapped <input type="radio"/> Hand Collected <input type="radio"/> Incidental
FISH SPECIES (circle species seen, if known): BK (brook trout), BN (brown trout), CT (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, fmlly BUCA); Sierran Treefrog (HYSI, fmlly PSRE or HYRE); Sierra Nevada Yellow-legged Frog (RASI)								
Amph. less common in HML: CA Toad (ANBO, fmlly BUBO); Bullfrog (RACT); Cascades Frog (RACA); CA Red-legged Frog (RADR); Sierra Newt (TASI, fmlly TATO)								
Reptiles: Sierra Gartersnake (THCO); Mountain Gartersnake (THEL); Valley Gartersnake (THSI); Western Pond Turtle (EMMA, fmlly CLMA)								

PHOTOS	Photo Number	Camera	Time	Date (yyyymmdd)	UTM E	UTM N	Comments
Overview	<i>Unmapped lake area</i>	<i>Canon 1430</i>	<i>1430</i>	<i>2019-Sep-11</i>	<i>0727637</i>	<i>4363867</i>	
Herps							
Other							

SITE SKETCH:	NOTES:
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Figure 5: VES data sheet from a survey conducted Sept. 11, 2019, at Warren Lake, Nevada County.

STREAM									
Inlet/Outlet (circle one) #		Stream Type: Perennial Ephemeral		Stream Currently Dry? Y N		Intermittent? Y N			
Start UTM E: 0727839 UTM N: 4363947		End UTM E: 0727839 UTM N: 4363921		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA			
Start Time: 1032		End Time: 1037		Duration (min): 5		Water Temp:		Air Temp:	
Fish present? Y (N)		Barrier 1) Photo #'s: 1033		UTM E: 0727824 UTM N: 4363921		Description: Man made fish barrier			
Herps present? Y (N)		Barrier 2) Photo #'s:		UTM E:		UTM N:			
Spawning evidence? Spawning / Redds / Fry / None		Barrier 3) Photo #'s:		UTM E:		UTM N:			
Inlet/Outlet (circle one) #		Stream Type: Perennial Ephemeral		Stream Currently Dry? Y N		Intermittent? Y N			
Start UTM E: 0728541 UTM N: 4364212		End UTM E: 0728539 UTM N: 4364184		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA			
Start Time: 1053		End Time: 1106		Duration (min): 13		Water Temp:		Air Temp:	
Fish present? Y (N)		Barrier 1) Photo #'s: WLFBI		UTM E: 728546 UTM N: 4364212		Description: Loss Jam Fish Barrier			
Herps present? Y (N)		Barrier 2) Photo #'s: WLFBI		UTM E: 728552 UTM N: 4364214		Description: Water Fall			
Spawning evidence? Spawning / Redds / Fry / None		Barrier 3) Photo #'s: WLFBI		UTM E: 728524 UTM N: 4364216		Description: Water Fall			
Inlet/Outlet (circle one) #		Stream Type: Perennial Ephemeral		Stream Currently Dry? Y N		Intermittent? Y N			
Start UTM E:		UTM N:		End UTM E:		UTM N:		Color: Clear Stained NA	
Start Time:		End Time:		Duration (min):		Water Temp:		Air Temp:	
Fish present? Y N		Barrier 1) Photo #'s:		UTM E:		UTM N:			
Herps present? Y N		Barrier 2) Photo #'s:		UTM E:		UTM N:			
Spawning evidence? Spawning / Redds / Fry / None		Barrier 3) Photo #'s:		UTM E:		UTM N:			
HERP SPECIES	In/Outlet #	# adults	# subadults	# metamorphs	larvae	# egg m.	# swabs	Survey Method	
(circle one) IN	#	⊘						Visual Trapped	
Calling? Y N	OUT							Aural Hand Collected Amp Net Incidental	
(circle one) IN	#							Visual Trapped	
Calling? Y N	OUT							Aural Hand Collected Amp Net Incidental	
(circle one) IN	#							Visual Trapped	
Calling? Y N	OUT							Aural Hand Collected Amp Net Incidental	
(circle one) IN	#							Visual Trapped	
Calling? Y N	OUT							Aural Hand Collected Amp Net Incidental	

Figure 5, Con't: VES data sheet from a survey conducted Sept. 11, 2019, at Warren Lake, Nevada County.