State of California Department of Fish and Wildlife

Memorandum

Date: October 29, 2019

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

Department of Fish and Wildlife 1701 Nimbus Road, Suite A Rancho Cordova, CA 95670

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 egregious*; 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 misplanting 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	М	-
BK	352	410	М	-
BK	340	370	F	Early
BK	320	340	F	Early
BK	260	200	М	-

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Figure 4: Data sheet with gill net data from a survey conducted Sept. 11, 2019, at Warren Lake, Nevada County.

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

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inlet Outlet (circle		Stream Type	Peren	nial	Echon		Stream Curre	ently Dry?		Y N	Intermitte	nt? Y	N
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Spawning evidence? Spawning / Redds / Fry / HERP SPECIES Calling? Y N C	None In/Outlet # In/Outlet I	to I known! BK (bri	Door troub BN (brown tros	η, CT (cum	roat frout)	GT (golden trout)	, RT (rainbow	trout) HYBR	ab (e.g., GT x	Amp Net Visual Aural Amp Net Visual Amp Net Visual Aural Amp Net Visual Aural Amp Net Visual Amp Net RTN, OTHER	Incidental Trapped Hand Colle Incidental (e.g., minnow	ected ected
Spawning evidence? Spawning / Redds / Fry / HERP SPECIES Calling? Y N C FISH SPECIES	None In/Outlet # Vote one) # NUT Since one) # Since one)	n, if known): BK (bro	pok srout), BN	(ANCA.	fmily BUCA); Sierran	reefrog (HYSI, fr	mly PSRE or	HYRE); Sic	erra Nevada Y	Amp Net Visual Aural Amp Net Visual Aural Amp Net Visual Aural Amp Net Visual Aural Amp Net RT, OTHER eliow-legged	Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Incidental Trapped Incidental Trapped Frog (RASI)	ected ected
Spawning evidence? Spawning / Redds / Fry / HERP SPECIES Calling? Y N C TSH SPECIES Amphibians Amphibians	None In/Outlet # Vote one) # N DUT JUT Stote one) # N DUT Stote one) # N DUT JUT JUT JUT JUT JUT JUT JUT JUT JUT J	n, if known): BK (bromander (AMMA), CA Toad (AMNO). fr	pook srout). BN (1 Yasemite Toac mniy BUBO): 8	(ANCA, Julfrog (R	fmily BUCA ACT); Caso); Sierran ades Frog	Treefrog (HYSI, fr (RACA); CA Red	mly PSRE ar Hegged Frog	HYRE); Sic (RADR); S	erra Nevada Y ierra Newt (T/	Amp Net Visual Aural Amp Net Visual Aural Amp Net Visual Aural Amp Net Visual Aural Amp Net RT, OTHER eliow-legged	Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Incidental Trapped Incidental Trapped Frog (RASI)	ected ected ected
Spawning evidence? Spawning / Redds / Fry / HERP SPECIES Calling? Y N C Table Calling? Y N C Calling? Y N	None In/Outlet # In/Outlet # In/Outlet # In/Outlet # In/Outlet # In/Outlet # In/Outlet	n, if known): BK (bro imander (AMMA): X CA Toad (AMNO, fi HCO): Mountain G.	pox srout), BN (Yasemite Taac mity BUBO); B artersnake (Ti	(ANCA, Builfrog (R HEL); Valk	imily BUCA ACT); Casc ey Gartersn); Sierran ades Frog aka (THSI	Treefrog (HYSI, fr (RACA); CA Red ; Western Pond T	mly PSRE ar l-legged Frog Turtle (EMMA	HYRE); Sic (RADR); S fmily CLM	erra Nevada Y ierra Newt (T/ A)	Amp Net Visual Aural Amp Net A	Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Hand Colle Incidental Trapped Incidental Trapped Incidental Trapped Frog (RASI)	ected ected
Spawning evidence? Spawning / Redds / Fry / HERP SPECIES Calling? Y N C Table Calling? Y N C Calling? Y N	None In/Outlet # In/Outlet I	n, if known): BK (bro mander (AMMA): 7 CA Tosd (AMBO, fr HCO); Mountain Gi stlman, California	pox srout), BN (Yasemite Taac mity BUBO); B artersnake (Ti	i (ANCA, Bullfrog (R HEL); Valk of Fish a	imily BUCA ACT); Casc ey Gartersn); Sierran ades Frog aka (THSI	Treefrog (HYSI, fr (RACA); CA Red ; Western Pond T	mly PSRE ar l-legged Frog Turtle (EMMA	HYRE); Sic (RADR); S fmily CLM	erra Nevada Y ierra Newt (TA A) rdova, CA 95	Amp Net Visual Aural Amp Net A	Incidental Trapped Hand Colle Incidental (e.g. minnow Frog (RASI)	ected ected

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