

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

# Memorandum

**Date:** August 19, 2020

**To:** Sarah Mussulman  
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Department of Fish and Wildlife  
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**Cc:** CDFW North Central Region Fish Files

**From:** Jacob Stout; Scientific Aide, and  
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**Subject: Resource Assessment at Sterling Lake, Nevada County**

Sterling Lake (Lake ID 13165), Nevada County, is located northwest of Truckee, CA, in the Tahoe National Forest (TNF) (**Figures 1, 2 & 3**). Sterling Lake is a reservoir impounded by a 32-foot-tall dam operated by PG&E as part of the Drum-Spaulding Hydroelectric Project (FERC Project No. 2310). The outlet from the dam flows into Fordyce Lake and eventually into the South Yuba River.



**Figure 1:** Overview photograph of Sterling Lake, Nevada County, CA taken from the southeast side of the lake on June 22, 2020 (CDFW).

Sterling Lake is accessed from Interstate 80 via Rattlesnake Road. TNF operates Sterling Lake Campground and provides several campsites with tables, fire pits and a bathroom. The northeast side of the lake is managed by Bear Yuba Land Trust and

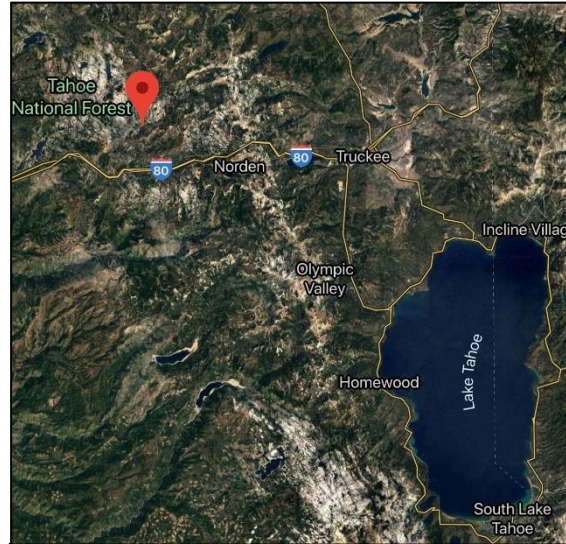
offers primitive camp sites and trails. Sterling Lake is also home to Camp Robert L. Cole, a Boy Scout Camp on the southwest side of the lake that has been in operation since 1954.

California Department of Fish and Wildlife (CDFW) planted Rainbow Trout (*Oncorhynchus mykiss*; RT) at Sterling Lake regularly from 1930 through 2001. Brook Trout (*Salvelinus fontinalis*; BK) were planted occasionally by CDFW between 1941 and 1979. Brown Trout (*Salmo trutta*; BN) were planted briefly from 1930 through 1936.

A CDFW gill net survey in 2001 captured Brook Trout, two Rainbow Trout, and many Lahontan Redsides (*Richardsonius egregius*; LRS). A 2013 survey captured a single Brook Trout and many Lahontan Redsides. These results suggest Lahontan Redsides will persist in the lake indefinitely; Rainbow Trout are not self-sustaining and are no longer present in the fishery; while Brook Trout are persisting at low densities, although the population may be in decline.

CDFW halted fish plants in 2001 because of Sterling Lake's proximity to the Mossy Pond Sierra Nevada Yellow-legged Frog (*Rana sierrae*; SNYLF) population. Although Sterling Lake is not hydrologically connected to SNYLF-containing waters, the nearest SNYLF location is only 700 meters distant (**Figure 3**).

The Aquatic Biodiversity Management Plan for the South Yuba River Management Unit (Mussulman & Lockhart 2014) recommends Sterling Lake be managed as a stocked fishery. The lake receives considerable recreational use and angling pressure, and active plants may be necessary to support a fishery. However, CDFW has not implemented this management direction, to date.



**Figure 2:** Map of Sterling Lake, Nevada County, (Red Pin) in relation to Lake Tahoe and Truckee, CA (Google Maps, retrieved 7.1.2020).



**Figure 3:** Aerial photo of Sterling Lake, Fordyce Lake, Mossy Pond, and the surrounding area looking south.



To determine the current status of the fishery at Sterling Lake, three CDFW Scientific Aids surveyed Sterling Lake on June 22, 2020. Two monofilament gill nets were set on opposite sides of the lake to sample the fishery. The net set on the southeast side of the lake was set at 9:25 PM on June 22, 2020, and was pulled the following morning on September 23, 2020, at 7:40 AM for a total survey effort of approximately 10 hours. The gill net catch included 17 Brook Trout and 176 Lahontan Redside minnows (**Figure 4, Table 1**).



**Figure 4:** Brook Trout catch (n=17) from the southeast gill net.

The net set on the northwest side of the lake was set at 8:50 PM on June 22, 2020, and was pulled the following morning on June 23, 2020 at 8:45 AM for a total survey effort of approximately 10 hours. The gill net catch included 18 Brook Trout (*Salvelinus fontinalis*, BK) and 452 Lahontan Redside minnows (*Richardsonius egregius*; LRS) (**Figure 5, Table 2**).



**Figure 5:** Brook Trout catch (n=18) from the northwest gill net.

**Figure 6** displays the length distribution of all Brook Trout (n=35) caught in Sterling Lake. The average total length was 342 mm (13.5 inches) with most individuals being between 340 mm (13.4 inches) and 379 mm (14.9 inches). Brook Trout were healthy and in good condition with an average condition factor of 0.994.

Brook Trout have not been planted in Sterling Lake since 1979 yet persist through natural reproduction despite substantial angling pressure. Yearling fish are not present in the gill net. This may be a result of the large Lahontan Redside catch overwhelming the portions of the gill net suitable to capturing yearlings. The absence of yearling fish could also indicate limited spawning success and/or recruitment to adult life stages. Young of year (YOY) are not represented in the gill net data because the size of mesh is too large to capture YOY. However, Brook Trout YOY were seen and captured by hand net (**Figure 7**). These observations illustrate successful Brook Trout spawning in Sterling Lake.

The Scientific Aids also conducted a Visual Encounter Survey (VES) of the entire lake on June 22, 2020, searching for diurnal herpetofauna. The VES began at 12:16 PM under clear skies, light wind, and an air temperature of 21° C. The survey continued

**Table 1:** Total length, weight, sex, egg stage, and condition factor (K) of fish captured in the southeast gill net at Sterling Lake, Nevada Co., on June 22, 2020.

Species	Length (mm)	Weight (g)	Sex (F/M)	Egg Stage	Condition Factor (K)
BK	308	320	F	EARLY	1.095
BK	341	476	F	EARLY	1.200
BK	374	481	M		0.919
BK	376	498	M		0.937
BK	390	574	F	EARLY	0.968
BK	376	488	F	EARLY	0.918
BK	375	545	M		1.033
BK	416	595	M		0.826
BK	281	232	M		1.046
BK	272	259	F	EARLY	1.287
BK	304	390	F	EARLY	1.388
BK	316	322	F	EARLY	1.020
BK	319	329	F	EARLY AND LATE	1.014
BK	346	354	F	EARLY AND LATE	0.855
BK	334	351	F	EARLY	0.942
BK	343	360	F	EARLY	0.892
BK	364	421	M		0.873
<b>Average</b>	<b>343</b>	<b>411</b>			<b>1.013</b>

until 14:49 PM for a total survey effort of 201 minutes. During this time one adult Mountain Garter Snake (*Thamnophis elegans elegans*) (**Figure 8**) was seen along the northern shore at 14:25 PM. In the evening two California Toads (*Anaxyrus boreas halophilus*) (**Figure 9**) and four actively calling Sierran Treefrogs (*Pseudacris sierra*) were observed along the southern shore.

The results of the June 22, 2020, survey reinforce the results of previous surveys at Sterling Lake. Brook Trout persist in the absence of stocking, up to 17 inches total length, and are present in greater densities than CDFW recorded in the

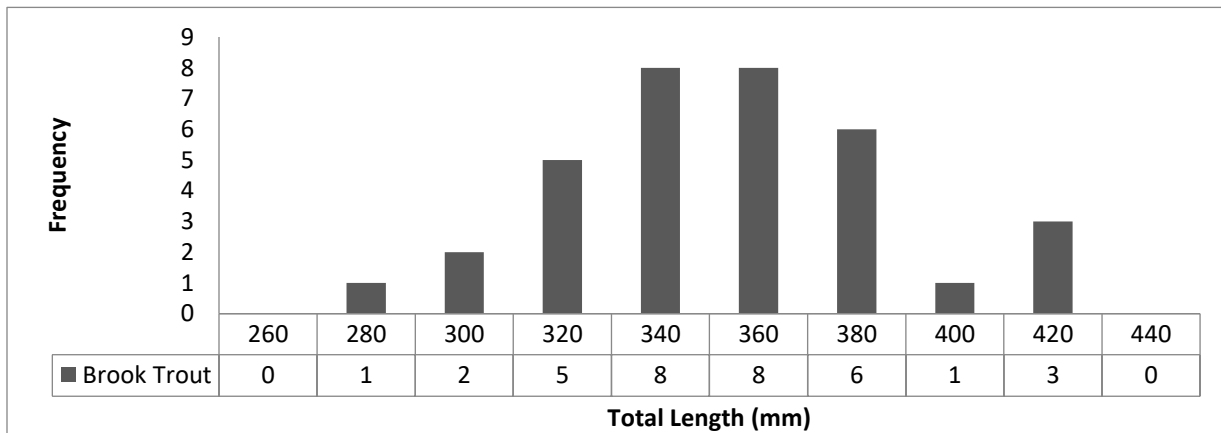


**Figure 7:** Brook Trout Young of Year (YOY) captured in Sterling Lake on June 22, 2020.

**Table 2:** Total length, weight, sex, egg stage, and condition factor (K) of fish captured in the northwest gill net at Sterling Lake, Nevada Co., on June 22, 2020.

Species	Length (mm)	Weight (g)	Sex (F/M)	Egg Stage	Condition Factor (K)
BK	340	360	M		0.916
BK	329	362	M		1.012
BK	336	381	F	EARLY	1.004
BK	348	486	M		1.153
BK	371	479	M		0.938
BK	341	392	M		0.989
BK	332	370	M		1.011
BK	338	400	F	EARLY	1.036
BK	342	382	F	EARLY	0.955
BK	327	359	F	EARLY	1.027
BK	404	539	M		0.817
BK	278	215	F	EARLY & LATE	1.001
BK	355	450	F	EARLY	1.006
BK	292	271	F	EARLY	1.088
BK	309	295	F	EARLY	1.000
BK	417	612	M		0.844
BK	355	369	F	EARLY	0.825
BK	324	324	M		0.953

**Average**                      **341**                      **391**                      **0.977**



**Figure 6:** Length-Frequency Histogram of Brook Trout captured by gill net at Sterling Lake, Nevada Co., on June 22, 2020.



earlier two surveys, despite substantial angling pressure. Adult fish are healthy and of good body condition and large numbers of Lahontan Redside forage are present. YOY were observed during the survey indicating successful spawning. However, the absence of small Brook Trout (< 200 mm total length), the large size of adults, and the variability of Brook Trout density across multiple surveys suggests that spawning success and/or adult recruitment is limited.



**Figure 8:** Mountain Garter Snake (*Thamnophis elegans elegans*) found along the northern shore of Sterling Lake on June 22, 2020.

The findings of the June 22, 2020, survey at Sterling Lake support reinstating fingerling plants of Rainbow Trout as recommended in the South Yuba Management Plan. Sterling Lake has sufficient forage and available habitat to support active management as a sports fishery to support the angling pressure and recreational use. Fingerlings should be planted annually for three years followed by monitoring surveys to monitor survivorship and growth. Monitoring surveys should include gill net, visual, and hook-and-line elements.

The proximity of Sterling Lake to a SNYLF population at the Mossy Pond complex requires consideration. Fingerling Rainbow Trout should not be planted by plane, as they have in the past, but delivered by truck and hand planted. This will minimize or eliminate the chance of fish being planted in the wrong waterbody. There is some concern that planting fish at Sterling Lake will supply a source of fish for illegal plants of



**Figure 9:** Three adult California Toads (*Anaxyrus boreas halophilus*) observed along the south shore of Sterling Lake, Nevada Co. the evening of June 22, 2020. The toad pictured in the center is sloughing old brown skin revealing fresh green skin beneath.

fish to neighboring fishless waters or SNYLF-occupied habitat. However, the June 22, 2020, survey demonstrates that fish have persisted in Sterling Lake despite halting fish plants, as a result that risk has been present with or without planting and should not be the sole reason that fish plants are not reinstated.

### **Citations**

Mussulman, S. and M. Lockhart. Aquatic biodiversity management plan for the South Yuba River Management Unit. California Department of Fish and Wildlife; 6/9/2014. [Cited 2020 July 6]. Available from:  
<http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=85427>

FISH SURVEYING

RESCAN LTM

Trout: rainbow trout (RT), golden trout (GT), cutthroat trout (CT), brown trout (BN), brook trout (BK), hybrids (GT x RT, CT x RT)										DATE: 6/22/2020		
Site Name (if available): Lake Sterling NW					Survey Crew: JTS LTM CMH					Net depth (m): 10.3		
SITE ID: 13165		Fish Survey Method: (circle one) gill net hook and line e-fish			Net Location (UTM NAD 83) 102 E: 0716077 N: 4359281			Fish captured? (circle one) Y (insert data below) N				
Gill Net near inlet		General location (circle one): near outlet other			Net Set Date: 6/22/2020		Net set time (hhmm): 2050		Net Pull Date: 6/22/2020		Net pull time (hhmm): 0845	
Electrofishing		Location: (inlet or outlet #)			Start coord. (downstream)		End coord. (upstream)		Start (hhmm):		End (hhmm):	On Time (sec):
E-fisher Settings (if needed):				Volts: —	Hz: —	Duty Cycle: —		Pulse: —		Other: —		
Fish #	Species	Tot Lgth (mm)	Weight (g)	Sex	Egg Stage (F only)			Otoliths?	Comments			
					Early	Ripe	Late					
1	BK	340	360	M								
2	BK	329	362	M								
3	BK	336	381	F	X							
4	BK	348	486	M								
5	BK	371	479	M								
6	BK	341	392	M								
7	BK	332	370	M								
8	BK	338	400	F	X							
9	BK	342	382	F	X							
10	BK	327	359	F	X							
11	BK	404	539	M								
12	BK	278	215	F	X		X					
13	BK	355	450	F	X							
14	BK	292	271	F	X							
15	BK	309	295	F	X							
16	BK	417	612	M								
17	BK	355	369	F	X							
18	BK	324	324	M								
19												
20	LRS	#452	total	Fish	#							
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PLEASE Return to: Isaac Chellman, California Department of Fish and Wildlife, (916) 358-4038; 1701 Nimbus Rd., Rancho Cordova, CA 95670

Field review \_\_\_\_\_ Copied \_\_\_\_\_ Entered \_\_\_\_\_ Proofed \_\_\_\_\_

Figure 10: Data sheet with gill net data from a survey conducted June 22, 2020, at Sterling Lake, Nevada County.





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

Site ID: <b>B165</b>	Date: <b>6/22/2020</b>	SKY: <input checked="" type="radio"/> Clear <input type="radio"/> Partly Cloudy <input type="radio"/> Mostly Cloudy <input type="radio"/> Over-cast	Rain <input type="radio"/> Snow <input type="radio"/> Smoke <input type="radio"/>	WIND: <input checked="" type="radio"/> Calm <input type="radio"/> Light <input type="radio"/> Moderate <input type="radio"/> Strong			
Topo Name: <b>Sterling Lake</b> (1:24,000)	County: <b>Nevada County</b>	Elevation: _____ m ft	If not surveyed, provide reason: _____	Private Property <input type="checkbox"/> Frozen <input type="checkbox"/> Not Found <input type="checkbox"/> No Access <input type="checkbox"/>			
Surveyors: <b>JTS LTM</b>	Water Type: <input checked="" type="radio"/> Lake <input type="radio"/> Unmapped pond <input type="radio"/> Marsh/ meadow <input type="radio"/> Spring seep <input type="radio"/> Stream (Skip to "STREAMS" on pg. 2)						
Lake Name: <b>Sterling Lake</b> (from map)	East UTM: <b>0716006</b>	North UTM: <b>4359044</b>	UTM Zone: <b>10</b>				
Color: <input checked="" type="radio"/> Clear <input type="radio"/> Stained	Water (5 m from shore, Temp 10cm deep): <b>17.5 @ 1201</b>	Color F <input checked="" type="radio"/> Air (1 m above water): <b>21 @ 1212</b>	Color E <input checked="" type="radio"/>	Seasonality: <input checked="" type="radio"/> Perennial <input type="radio"/> Ephemeral			
Turbidity: <input checked="" type="radio"/> Clear <input type="radio"/> Cloudy	Survey START time: <b>1216</b>	Survey END time: <b>1449</b>	Total survey duration (min): <b>201</b>	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	# swabs	# egg m.	Survey Method
PSRE	4					2	Visual Trapped Aural Hand Collected Amp Net Incidental
Calling? <input checked="" type="radio"/> Y <input type="radio"/> N							
THEL	1						Visual Trapped Aural Hand Collected Amp Net Incidental
Calling? <input checked="" type="radio"/> Y <input type="radio"/> N							
AUBO	2						Visual Trapped Aural Hand Collected Amp Net Incidental
Calling? <input type="radio"/> Y <input type="radio"/> N							
							Visual Trapped Aural Hand Collected Amp Net Incidental
Calling? <input type="radio"/> Y <input type="radio"/> N							
							Visual Trapped Aural Hand Collected Amp Net Incidental
Calling? <input type="radio"/> Y <input type="radio"/> N							
<b>FISH SPECIES</b> (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, frmly BUCA); Sierran Treefrog (HYSI, frmly PSRE or HYRE); Sierra Nevada Yellow-legged Frog (RASI) Amph. less common in HML: CA Toad (ANBO, frmly BUBO); Bullfrog (RACT); Cascades Frog (RACA); CA Red-legged Frog (RADR); Sierra Newt (TASI, frmly TATO) Reptiles: Sierra Gartersnake (THCO); Mountain Gartersnake (THEL); Valley Gartersnake (THSI); Western Pond Turtle (EMMA, frmly CLMA)							

PHOTOS	Photo Number	Camera	Time	Date (yyyy-mm-dd)	UTM E	UTM N	Comments
Overview	1319	LTM-P	1319	2020-Jun-22	0716737	4358938	SE Peak facing NW
Herps	JTSP2138	P	2138				AUBO 1
	JTSP2144	P	2144				AUBO 2
	JTSP2146	P	2146				PSRE
Other	1415	LTM-P	1415	0716734	0716734	4359227	UNID Trout Parr in Gill Net
	1420	LTM-P	1420				Dead LPS in dipnet

<p><b>SITE SKETCH:</b></p> <p>Outlet Dam</p> <p>• LTM overview</p>	<p><b>NOTES:</b></p> <p>Inlet 1 start/End pics (1226, 1230)                  Inlet 2 start/End pics (1354, 1402)                  Inlet 3 start/End pics (1430, 1436)                  Inlet 2: mouth, deep bft channel. UNID Large Carp-like fish. Had Carp/Sucker scales, and bottom fins are white. Inlet 2 not flowing.                  UNID trout YOY.                  Inlet 3: Dry at mouth, becomes wet, no fish seen until water touches lake.                  UNID YOY w/ Parr marks.                  many schools of Lahontan Redside.                  Water stained w/ pollen along banks.</p>
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**Figure 12:** VES data sheet from a survey conducted June 22, 2020, at Sterling Lake, Nevada County.

STREAM									
Inlet		Outlet (circle one) # 1		Stream Type: Perennial (Ephemeral)		Stream Currently Dry? Y (N)		Intermittent? (Y) N	
Start		UTM E: 0716084		UTM N: 4358916		End		UTM E: 0716041	
UTM N: 4358837		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA		*BARRIERS (fill out info below)*			
Start Time: 1226		End Time: 1230		Duration (min): 4		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? (Y) N		Barrier 3		Photo #'s:		UTM E:		UTM N:	
Spawning / Redds / Fry / None		Description:		Description:		Description:		Description:	
Inlet		Outlet (circle one) # 2		Stream Type: Perennial (Ephemeral)		Stream Currently Dry? Y (N)		Intermittent? (Y) N	
Start		UTM E: 0716774		UTM N: 4359166		End		UTM E: 0716843	
UTM N: 4359192		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA		*BARRIERS (fill out info below)*			
Start Time: 1345		End Time: 1402		Duration (min): 7		Water Temp: -		Air Temp: -	
Fish present? (Y) N		Barrier 1		Photo #'s: 1402		UTM E: 0716843		UTM N: 4359192	
Herps present? (Y) N		Barrier 2		Photo #'s:		UTM E:		UTM N:	
Spawning evidence? (Y) N		Barrier 3		Photo #'s:		UTM E:		UTM N:	
Spawning / Redds / Fry / None		Description: Seasonal FB. 10 ft drop		Description:		Description:		Description:	
Inlet		Outlet (circle one) # 3		Stream Type: Perennial (Ephemeral)		Stream Currently Dry? Y (N)		Intermittent? (Y) N	
Start		UTM E: 0716809		UTM N: 4359359		End		UTM E: 0716882	
UTM N: 4359392		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA		*BARRIERS (fill out info below)*			
Start Time: 1430		End Time: 1436		Duration (min): 6		Water Temp: -		Air Temp: -	
Fish present? (Y) N		Barrier 1		Photo #'s: 1443		UTM E: 0716831		UTM N: 4359374	
Herps present? (Y) N		Barrier 2		Photo #'s:		UTM E:		UTM N:	
Spawning evidence? (Y) N		Barrier 3		Photo #'s:		UTM E:		UTM N:	
Spawning / Redds / Fry / None		Description: Seasonal Barrier. 6 ft drop		Description:		Description:		Description:	
Inlet		Outlet (circle one) # 1		Stream Type: Perennial (Ephemeral)		Stream Currently Dry? Y (N)		Intermittent? (Y) N	
Start		UTM E: 0716033		UTM N: 4359436		End		UTM E: 0715894	
UTM N: 4359483		Color: (Clear) Stained NA		Turbidity: (Clear) Cloudy NA		*BARRIERS (fill out info below)*			
Start Time: 1302		End Time: 1320		Duration (min): 18		Water Temp: 13.5		Air Temp: 23	
Fish present? (Y) N		Barrier 1		Photo #'s: JTSPI323		UTM E:		UTM N:	
Herps present? (Y) N		Barrier 2		Photo #'s:		UTM E:		UTM N:	
Spawning evidence? (Y) N		Barrier 3		Photo #'s:		UTM E:		UTM N:	
Spawning / Redds / Fry / None		Description: Very steep, intermittent, many boulders		Description:		Description:		Description:	
HERP SPECIES	In/Outlet #	# adults	# subadults	# metamorphs	larvae	# egg m.	# swabs	Survey Method	
	(circle one) #							Visual Trapped	
Calling? Y N	IN							Aural Hand Collected	
	OUT							Amp Net Incidental	
	(circle one) #							Visual Trapped	
Calling? Y N	IN							Aural Hand Collected	
	OUT							Amp Net Incidental	
	(circle one) #							Visual Trapped	
Calling? Y N	IN							Aural Hand Collected	
	OUT							Amp Net Incidental	
	(circle one) #							Visual Trapped	
Calling? Y N	IN							Aural Hand Collected	
	OUT							Amp Net Incidental	

Figure 12, Con't: VES data sheet from a survey conducted June 22, 2020, at Sterling Lake, Nevada County.