

# Memorandum

Date: 12/20/2017

To: Sarah Mussulman  
Senior Environmental Scientist (Supervisor)  
North Central Region

From: Mitch Lockhart  
Environmental Scientist  
North Central Region

Cc: Region 2 Fish Files

**Subject: Pre-stocking Evaluation at Middle Velma Lake, El Dorado County, Desolation Wilderness.**

**Action: Visual Encounter Amphibian Survey and Gillnet Fish Sample**

## SUMMARY

The following information about Middle Velma Lake (Figure 1) was presented in the *Aquatic Biodiversity Management Plan for the Desolation Wilderness Management Unit* (CDFW 2012):

*Middle Velma Lake is a well-known trophy rainbow trout fishery and has earned a distinguished reputation amongst Desolation Wilderness anglers. It has been stocked with rainbow trout since the 1940s without any variation in species. HML (High Mountain Lakes) gill net data collected in 2003 demonstrate the rainbow trout population is not self-sustaining and has dwindled in the absence of stocking. Rainbow trout stocking will resume in numbers and frequency similar to historic management to reestablish this trophy fishery.*



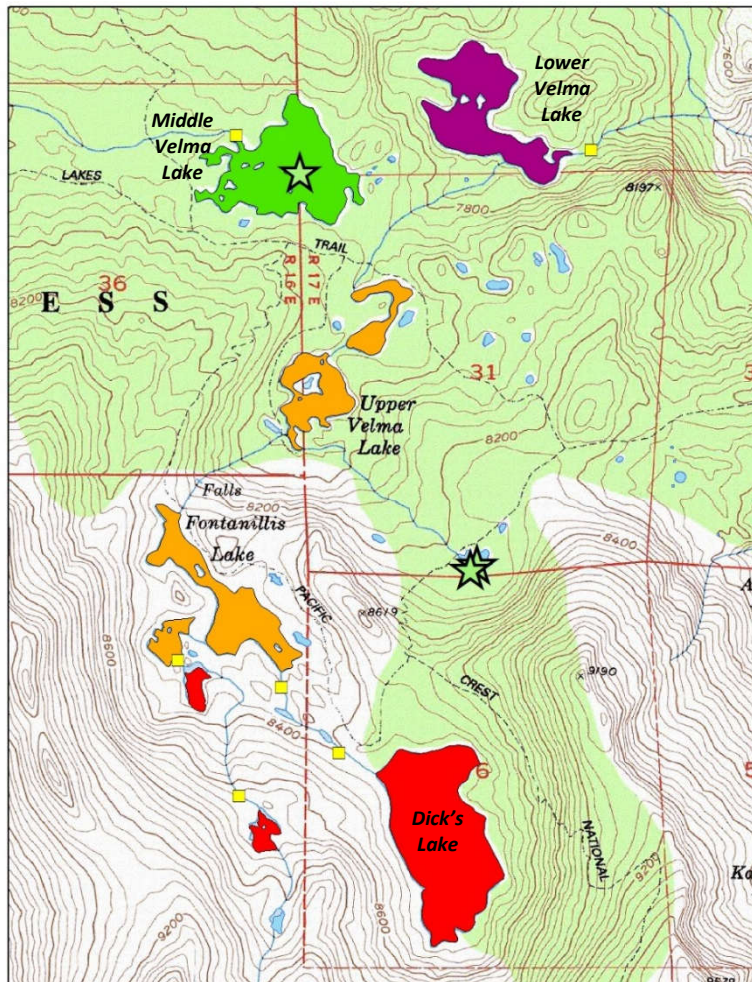
Figure 1: Middle Velma Lake (Site ID 13942), El Dorado County California. Google Earth (7/13/2016)

The intent, as stated in the plan, is to manage the lake as a put-and-grow, aerially planted, rainbow trout fishery. The *CDFW Hatchery Operations Final Environmental Impact Report EIR/EIS* (2010) provides direction to mitigate effects of fish stocking to California's native species. Specifically, Appendix K – *Mitigation Strategies for Effects of Fish Stocking*, outlines a pre-stocking evaluation process to be completed before planting a high mountain lake in California. CDFW surveyed the lake in 2003 and last planted the lake in 2007 (Table 1). In

accordance with Appendix K, stocking evaluations must rely upon data collected within the last five years. As a result, Mitch Lockhart, CDFW Environmental Scientist, assisted by a CDFW volunteer, surveyed Middle Velma Lake on August 20, 2016, for fish and amphibians. Sierra Nevada yellow-legged (*Rana sierrae*) frog adults, juveniles, and tadpoles were observed during a visual encounter survey, and a single rainbow X golden trout hybrid was captured via gill nets. Therefore, rainbow trout will not be planted at Middle Velma due to potential adverse impacts to Sierra Nevada yellow-legged frog.

**ENVIRONMENTAL SETTING**

Middle Velma Lake is located in the Desolation Wilderness, El Dorado County, at approximately 7,900 feet above mean sea level and is managed by the Eldorado National Forest. The lake sits within a glaciated saddle and drains west into the headwaters of the Rubicon River. It receives high day and overnight use during the summer recreation season due to its location along the Pacific Crest Trail and the relatively short 5-mile approach from the Eagle Falls trailhead. The neighboring water bodies nearest Middle Velma Lake are not within the same watershed. A shallow crest divides Middle Velma Lake from Upper and Lower Velma lakes. The watershed of Upper and Lower Velma lakes drains eastward to Emerald Bay and Lake Tahoe (Figure 2).



**Figure 2: The Velma Lakes and surrounding basin. Colored lakes indicate fish presence as per 2003 CDFW HML surveys: red = brook trout; green = rainbow trout; orange = brook and rainbow trout; and purple = brook, rainbow, and brown trout. Yellow squares indicate locations of fish passage impediments. Finally, green stars indicate historical *Rana sierrae* observations.**

**Table 1: Stocking Events at Middle Velma Lake, 1980 to Current.**

Year	Species	Number
2007	RT	2,000
2000	RT	6,000
1999	RT	6,000
1998	RT	6,000
1997	RT	6,000
1996	RT	5,950
1995	RT	6,000
1994	RT	6,000
1993	RT	6,000
1992	RT	6,000
1991	RT	5,400
1990	RT	6,300
1989	RT	6,000
1988	RT	6,000
1987	RT	5,000
1986	RT	5,000
1985	RT	5,000
1984	RT	6,000
1983	RT	6,000
1982	RT	5,775
1981	RT	6,000
1980	RT	6,048

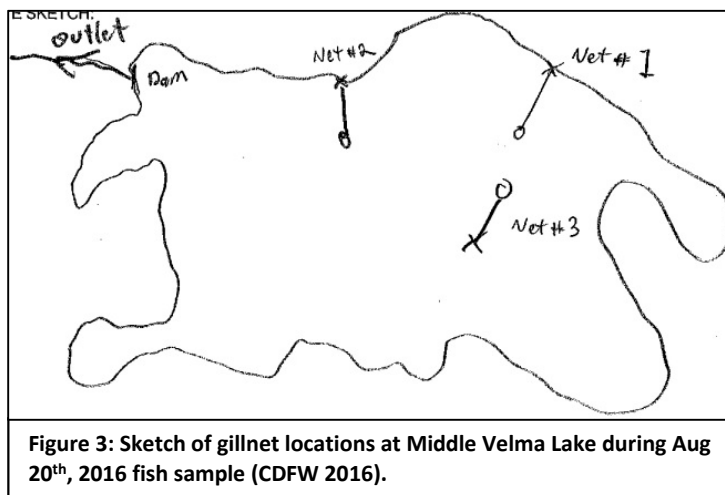
**SURVEY METHODS & RESULTS**

Mitch Lockhart conducted a visual encounter survey using the CDFW High Mountain Lakes survey protocol for diurnal amphibians on August 20, 2016, from 9:50am to 2:30pm. Total survey effort was 250 minutes. Weather was clear and warm with a slight breeze. Survey results are summarized in Table 2.

**Table 2: VES observations at Middle Velma Lake by Mitch Lockhart, CDFW, on 8/20/2016.**

Common Name	Species Name	Adult	Juvenile	Larvae
Sierra Nevada Yellow-legged Frog	<i>Rana sierrae</i>	7	2	2
Pacific Tree Frog	<i>Pseudacris regilla</i>	2	0	22
Sierra Garter Snake	<i>Thamnophis elegans</i>	1	0	0

Mitch Lockhart and a CDFW volunteer set three multi-panel, sinking, monofilament gillnets on August 20, 2016. The net locations were chosen by Mitch Lockhart to sample a variety of depths and habitats in an effort to determine fish presence (Figure 3). Originally, an eight-hour daytime sample was planned. However, both fish and *Rana sierrae* were thought to be absent. Once presence of *Rana sierrae* was determined, Mitch Lockhart left gillnets fishing overnight to both extend the length of the survey and to sample the nighttime activity period. The sampling effort resulted in 49.5 net hours yielding one rainbow X golden trout hybrid. The gill net sampling results are summarized in Table 3.



**Table 3: Summary of gillnet sampling effort at Middle Velma Lake, 8/20/ 2016.**

Net #	Net Depth	Net Set Date	Net Set Time	Net Pull Date	Net Pull Time	Net Hours
1	15 - 20 ft	8/20/2016	7:15 AM	8/20/2016	2:30 PM	7.25
2	> 20ft	8/20/2016	8:00 AM	8/21/2016	7:30 AM	23.5
3	-	8/20/2016	3:00 PM	8/21/2016	9:45 AM	18.75

Fish Species	Total Length (mm)	Inches	Weight (g)	Lbs.	Notes
RTxGT	557	21.9	1750	3.85	stomach contents: dragonfly larvae

#### PRE-STOCKING EVALUATION CONCLUSION

Middle Velma Lake was not known to support Sierra Nevada yellow-legged frogs. The only recorded sighting is from 1949 and has vague location information. The last time a frog had been observed anywhere in the Velma basin was in 1997. CDFW did not observe frogs during the 2003 survey. Yet, Middle Velma Lake supports a breeding population of Sierra Nevada yellow-legged frogs. It is likely the population persisted with such few numbers that it escaped CDFW's basin-wide survey effort in 2003 and has recently expanded now that Middle Velma Lake is largely devoid of fish.

What is unclear is if the population persisted at Middle Velma during the decades of stocking or if the population uses different breeding locales that have yet to be found. To help understand the frog population(s), neighboring habitats should be resurveyed; including all lakes, ponds, marshes, and streams within the Velma basin.

Adult trout prey upon multiple life stages of Sierra Nevada yellow-legged frogs and can have significant adverse impacts to frog populations (CDFW 2011). Therefore, rainbow trout will no longer be aerially planted at Middle Velma Lake and CDFW will manage the lake as a Sierra Nevada yellow-legged frog breeding site.

#### LITERATURE CITED:

CDFW 2010. *CDFW Hatchery Operations Final Environmental Impact Report EIR/EIS*. California Department of Fish and Game; Sept 2009. Available from:

CDFW 2011. Report to the Fish and Game Commission: A status review of the mountain yellow-legged frog (*Rana sierrae* and *Rana muscosa*). CA Fish and Game Commission. California Department of Fish and Game; 11/28/2011. Available from: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=90162>

CDFW 2012. *Aquatic Biodiversity Management Plan for the Desolation Wilderness*. California Department of Fish and Wildlife; 12/19/2012. Available from: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=59961>