

Memorandum

Date: 12/14/15

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Subject: Native amphibian monitoring in South Yuba River Management Unit – 2015 Update.

2015 Update: Drought funding was used to monitor three SNYLF populations in 2015 – Kaneen Lake, Wagon Wheel Lake and Rattlesnake Creek. No SNYLF were observed at Kaneen or Wagon Wheel and both of these populations may be extirpated. Surveyors observed SNYLF clustered at remaining wetted habitat at Rattlesnake Creek, however, numbers were down and the amount of wetted habitat remaining after four years of extreme drought may not be sufficient for overwintering frogs. Additionally, no SNYLF were observed in Five Lakes Basin or the ponds near French Lake in 2013, and if SNYLF are extirpated from these areas a large section of the management unit now contains no SNYLF and would likely require translocations to return SNYLF to the area.

INTRODUCTION

There are seven Sierra Nevada yellow-legged frog (*Rana sierrae*, SNYLF) populations within the South Yuba River Management Unit (Figure 1) and six of them are addressed in this memorandum. Also included in this document is a small population southeast of Devil's Oven Lake in the Truckee River drainage. Due to its complexity the Mossy Pond SNYLF population is addressed separately. There is little evidence of persistent SNYLF populations within the management unit with the exception of Rattlesnake Creek and Mossy Pond. The California Department of Fish and Wildlife (CDFW) began monitoring these populations in 2002.

The Aquatic Biodiversity Management Plan for the South Yuba River Management Unit (CDFW 2012, Administrative Draft) identifies SNYLF sites as amphibian resources and prescribes continued regular monitoring of the populations. Additionally, Paradise Lake is identified as a fish removal site due to the presence of brook trout, rainbow trout and breeding SNYLF.

ENVIRONMENTAL SETTING

South Yuba River Management Unit (MU) encompasses the entire upper watershed of the South Yuba River with elevations ranging from 850 meters to 2686 meters. The watershed is in northern California, immediately west of Donner Pass and north of Interstate 80. The Tahoe National Forest is responsible for a majority of land within the MU, although a significant number of parcels throughout the area are held by private land owners. None of the land within the MU is designated wilderness and a network of dirt and gravel roads provides recreational access.

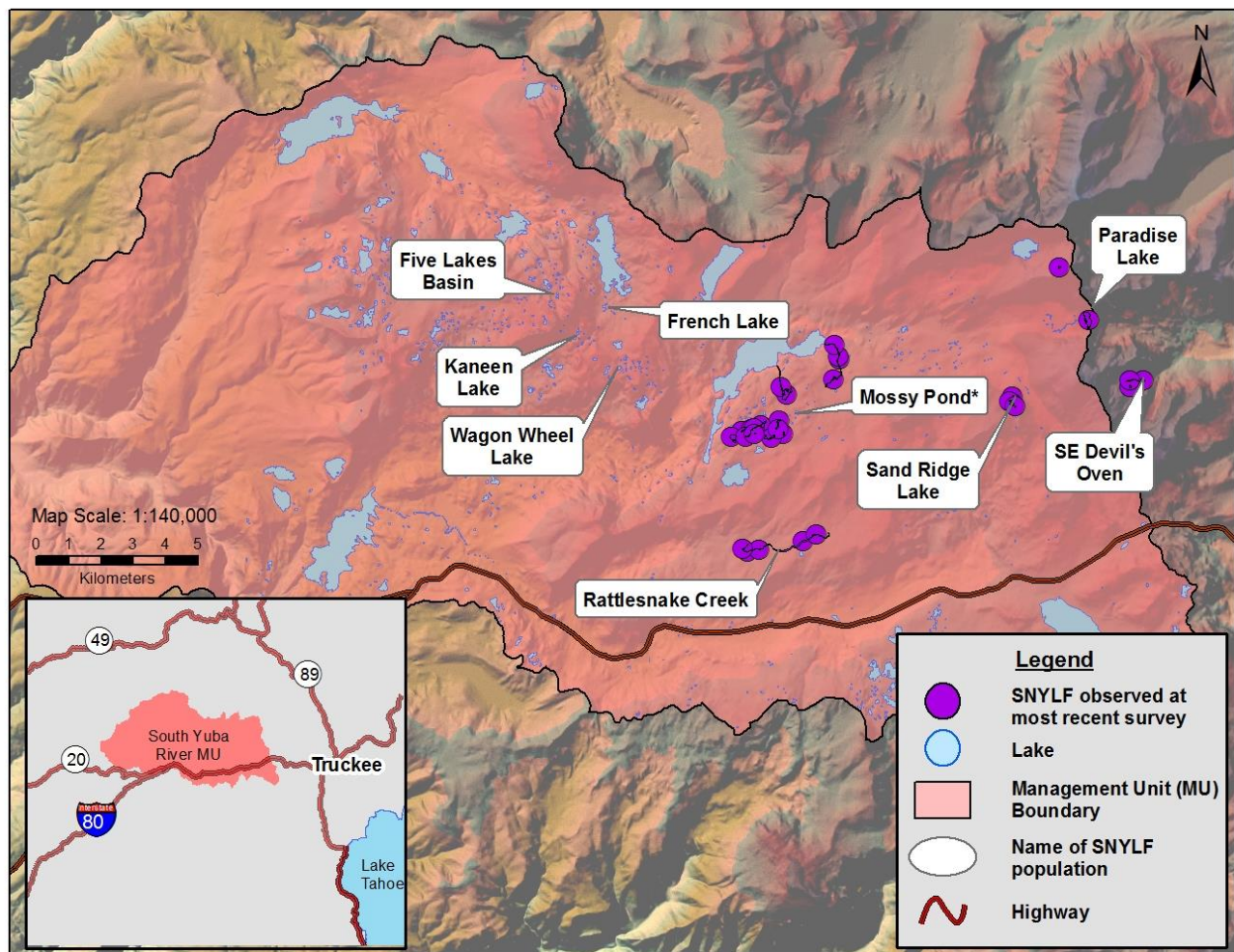


Figure 1: Map of SNYLF populations, shown in purple, that were extant in the South Yuba Management Unit at most recent survey. The locations of Five Lakes Basin and Wagon Wheel Lake are noted for reference. SE Devil's Oven is included in this memorandum because of its proximity to Paradise Lake. *Mossy Pond is not addressed in this memorandum.

THREATS

- **Introduced Fish** – Paradise Lake contains a breeding SNYLF population alongside brook and rainbow trout. CDFW believes brook trout will persist at Paradise Lake. Mont Lake, adjacent to Keenan Lake, was planted with golden trout in 2007; golden trout are not expected to persist at Mont Lake and any remaining fish will be mechanically removed by CDFW. Although the section of Rattlesnake Creek where SNYLF are observed is fishless, introduced fish persist in the lower sections of the creek and accidental or illegal movement of fish could harm SNYLF in Rattlesnake Creek. Multiple lakes in Five Lakes Basin continue to support fish although SNYLF may no longer be present in Five Lakes Basin.
- **Disease** – All SNYLF populations in South Yuba River MU are Bd positive. A total of 46 epithelial swabs were collected between 2008 and 2011 and Bd DNA was detected in 29 swabs (63%) in amounts ranging from very light to heavy. Due to the small size of South Yuba SNYLF populations only a few swabs were collected from each population.
- **Marginal Habitat** – South Yuba Management Unit SNYLF populations are mostly persisting in isolated habitats with very little water. Any disturbance, natural or otherwise, that changes the hydrology or limnology of the overwintering habitat poses a potential extirpation risk to the population. Severe winter conditions, extended drought, or anthropogenic habitat disturbances are some of the potential risks.
- **Human Impacts** – The frog population at Paradise Lake is persisting at a site with high levels of public use. Garbage, human waste, and campfire rings are present around the perimeter of the lake,

particularly along the warm western shore of the lake where most SNYLF tadpoles are observed. It is possible owners of nearby cabins have introduced fish into Paradise Lake in the past and may do so again.

MONITORING DATA AND POPULATION STATUS

Rattlesnake Creek – Updated 2015

Eight years of monitoring data indicate the Rattlesnake Creek SNYLF population is stable (Figure 2, Figure 3) although it is difficult to derive trends due to the small number of adults observed in any given year. The population is considered at risk of extirpation due to its small size and shallow habitat.

Rattlesnake Creek is ephemeral most years and the creek consists of pools between dry sections of stream bed with SNYLF clustered at the wetted habitat. A small SNYLF population was observed on Rattlesnake Creek by USGS in 1995 and 1996 (CNDDB). CDFW surveyed a small unnamed pond, 13275, in 2004 and in 2009 CDFW began surveying the adjacent section of Rattlesnake Creek and all SNYLF life stages were observed along two kilometers of stream and associated side pools.

2015 Update: Rattlesnake Creek was surveyed using drought funding on September 16-17th, 2015 and the majority of the creek was totally dry at that time. A single adult, two juveniles and 253 larvae were observed – generally wherever pools remained surveyors observed SNYLF. Even one of the deepest pools (Photo 1) had shrunk to a shallow puddle (Photo 2) and it remains to be seen in 2016 if SNYLF survive the winter at Rattlesnake Creek.

Photo 1: Deep pool with SNYLF larvae looking upstream on 7/28/2009. Note the amount of streamflow and the diagonal crack in the rock at the back of the photo (CDFW).



Photo 2: The same pool on 9/16/2015. The large rock in the foreground is completely underwater in the 2009 photo.



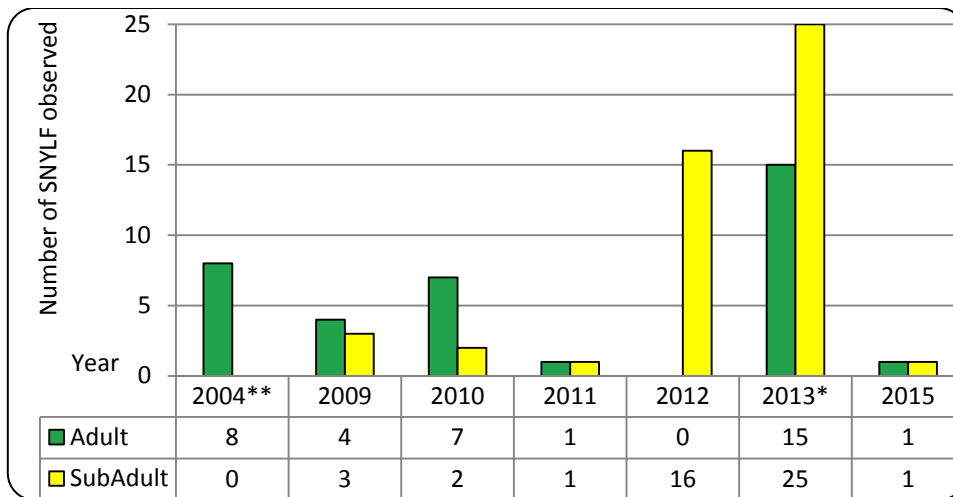


Figure 2: VES Data by life stage in Rattlesnake Creek from 2004 to 2012. Site 13275 was the only site surveyed in 2004; it was resurveyed in 2010 and no animals were observed. A new stream reach was surveyed in 2012 and the data are included. 2013 data includes all reaches; 2013 is the first year all reaches were surveyed in a single day. 2015 data includes all reaches except the uppermost which appeared to be totally dry.

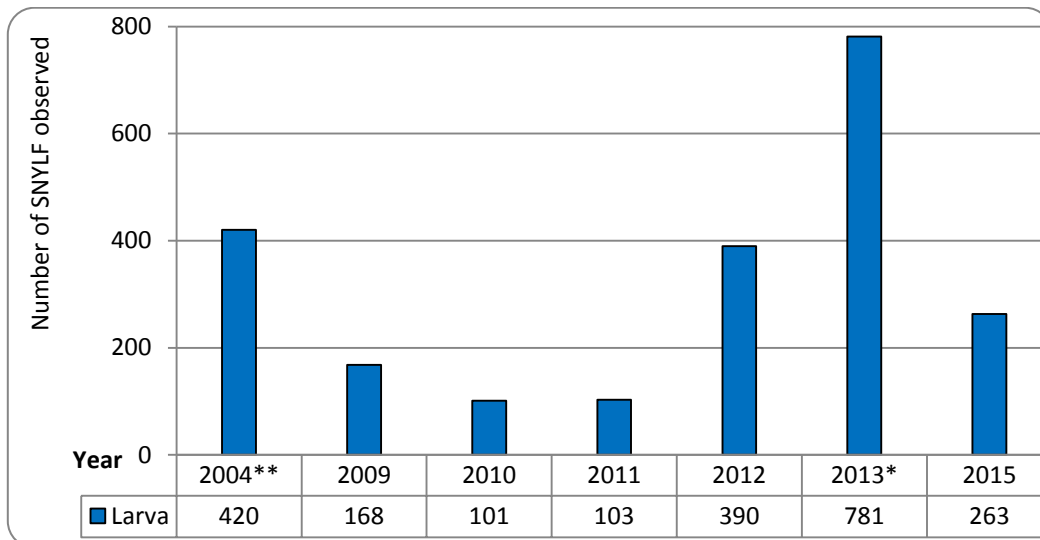


Figure 3: VES results for larvae in Rattlesnake Creek from 2004 to 2012. Site 13275 was the only site surveyed in 2004; it was resurveyed in 2010 and no animals were observed. A new stream reach was surveyed in 2012 and the data are included. 2013 data includes all reaches; 2013 is the first year all reaches were surveyed in a single day. 2015 data includes all reaches except the uppermost which appeared to be totally dry.

Paradise Lake

Paradise Lake (Figure 4) is located in the northeast corner of the South Yuba River MU at approximately 7700' elevation. Uncertainty about the status of this SNYLF population exists due to its small size and limited monitoring data (Figure 5), but CDFW considers this population highly susceptible to extirpation.

SNYLF were detected at Paradise Lake in 1999 by USGS. CDFW monitored the site in 2004 but did not find SNYLF and the population was considered extirpated. SNYLF were detected again at Paradise Lake in 2008 by USFS; however, CDFW was unaware of this and planted rainbow trout in the lake in 2009. As a result of the presence of SNYLF, Paradise Lake will no longer be stocked and the remaining trout will be mechanically removed. Data indicate rainbow trout will not persist in the lake but brook trout are likely self-sustaining.



Figure 4: Paradise Lake from the northeast (CDFW 2012).

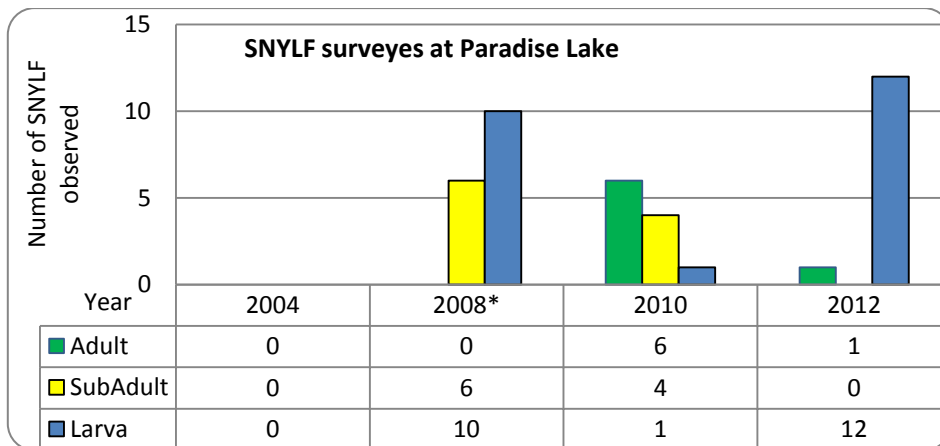


Figure 5: VES data by life stage at Paradise Lake from 2008 to 2012. *Note that 2008 data was collected by USFS.

Kaneen Lake – Updated 2015

Ten years of monitoring data suggest that the SNYLF population at Kaneen Lake is in decline (Figure 6) although small numbers of animals make deriving trends difficult. In 2001, CDFW observed a small SNYLF population coexisting with cutthroat trout at Kaneen Lake. Monitoring surveys conducted in 2010 indicate Kaneen Lake is fishless, however, Nearby Mont Lake was planted with golden trout in 2007 and fish were still present during a 2010 monitoring survey. Fish presence at Mont Lake may be contributing to SNYLF decline in the area and CDFW will mechanically remove all remaining fish.

2015 Update: No SNYLF were observed at Kaneen Lake in either 2015 when drought funding was used to monitor the lake, or in 2013 when Mont Lake was also surveyed. Gill net surveys were also conducted in Mont Lake in both 2013 and 2015 and no fish were captured or observed during any of the surveys – CDFW believes Mont Lake is fishless.

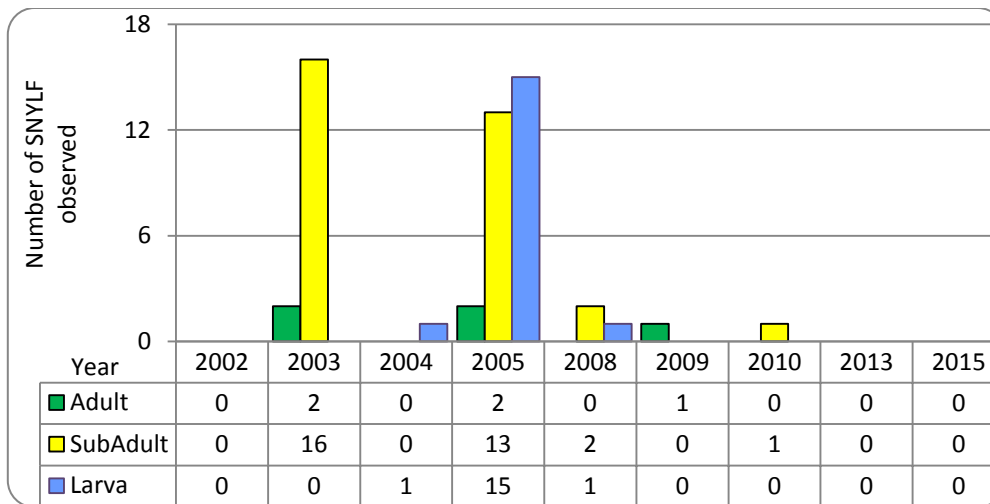


Figure 6: VES results by life stage at Kaneen Lake from 2002 through 2015.

Wagon Wheel – Updated 2015

Ten years of amphibian monitoring at Wagon Wheel Lake suggest SNYLF are in decline or extirpated from the area (Figure 7). No SNYLF were observed during 2010 monitoring surveys. SNYLF were observed in 2001 at Wagon Wheel Lake and three unnamed sites nearby; site IDs 12844, 13011 and 13016. Although many small lakes and ponds surround Wagon Wheel Lake there is no deep water habitat in the area. CDFW will continue monitoring the area to determine the status of SNYLF.

2015 Update: CDFW has now conducted four consecutive surveys at and nearby Wagon Wheel Lake without observing a single SNYLF and considers this population extirpated.

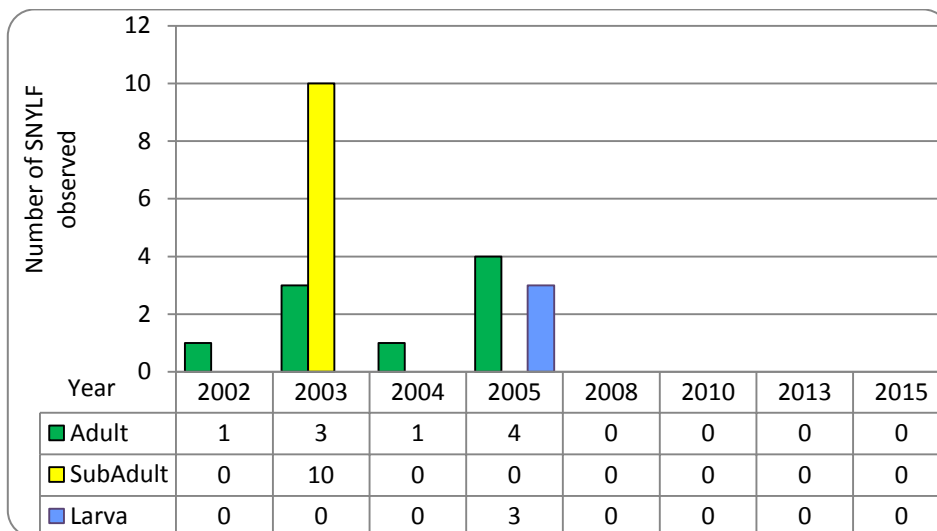


Figure 7: VES results by life stage at Wagon Wheel Lake and three unnamed ponds. All sites were surveyed in 2003, 2004, 2005, 2010, and 2013. Additional small ponds were also surveyed in 2015, as well as two small flowing tributaries near Wagon Wheel.

French Lake – Updated 2013

SNYLF were observed at two unnamed fishless ponds south of French Lake, site ID 12771 and 12775 by CDFW crews in 2002. Surveyors consistently detect low numbers of breeding SNYLF (Figure 8) but the ponds are shallow and draw down very low in late summer. Thus it is unclear if SNYLF will persist at these sites. CDFW biologists will continue to monitor the population and the sites will be managed as amphibian resources.

2013 Update: Both ponds were surveyed on 6/22/2013 and no SNYLF were observed. CDFW will continue monitoring in the area.

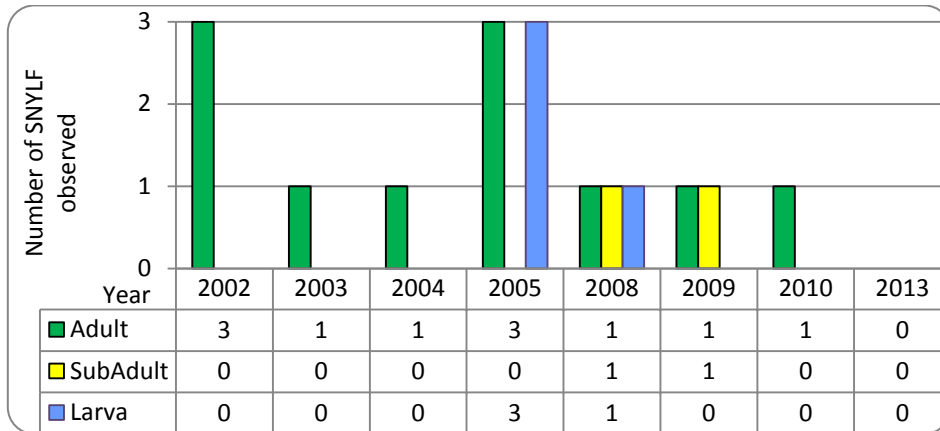


Figure 8: SNYLF survey results by life stage at two unnamed sites south of French Lake. In 2010 only site 12775 was surveyed. Larvae were observed once at each site.

Five Lakes Basin – Updated 2013

CDFW crews observed one sub-adult SNYLF in Five Lakes Basin in 2004 and 2008, and USFS crews observed 3 small adults in 2009 (CNDDDB). The SNYLF population at Five Lakes Basin may be extirpated since no frogs were seen during 2010 or 2011 amphibian monitoring surveys. It is unclear if the population will recover with fish removal alone and translocations may be necessary to reestablish a robust SNYLF population. The situation is further complicated by the presence of fish in Glacier Lake and lack of a suitably large and stable donor population in close proximity to Five Lakes Basin. CDFW will continue monitoring the area to determine the status of SNYLF.

2013 Update: All sites in Five Lakes Basin were surveyed from 6/19 through 6/22/2013 and no SNYLF were observed. This is a third consecutive survey without SNYLF and CDFW considers this population extirpated, although due to the large amount of habitat a small population may still remain. Long term management plans for the area include fish removal in the basin and translocation of SNYLF, possibly from the Mossy Pond SNYLF population.

Sand Ridge Lake – Updated 2013

Eight years of monitoring data suggest the SNYLF population at Sand Ridge Lake and two unnamed ponds is stable (Figure 9) although small population size makes deriving trends difficult. Breeding occurs in Sand Ridge Lake. Small ponds surrounding Sand Ridge Lake may provide foraging and basking habitat for adult and juvenile SNYLF. Gill net surveys indicate fish are not present in any of the lakes.

Opportunities for SNYLF to expand into additional habitat are limited by a general lack of deep lakes in the area and the small size of the population renders it extremely vulnerable to extirpation.

2013 Update: Visual encounter surveys were conducted at Sand Ridge Lake and eight small ponds nearby on August 4, 2013 during good survey conditions. The population still appears to be stable.

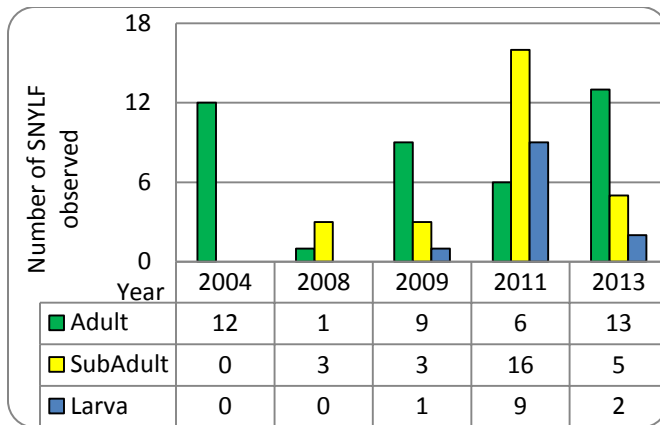


Figure 9: VES Data by life stage in Sand Ridge Lake and nearby ponds from 2004 to 2011. Sand Ridge Lake was surveyed each year; 13063 was surveyed in 2004, 2008 and 2011; 13077 was surveyed in 2008 and 2009. 2013: All sites in the immediate vicinity of Sand Ridge Lake were surveyed.

Southeast Devil's Oven Lake

CDFW surveyed this area in 2004, 2011 and 2012 and because of the limited amount of data the status of the population is unclear (Figure 10). A single adult SNLYF was seen at site 13030 in 2004, 2011 and 2012. At site 13039, no SNLYF were seen in 2004; five adults and eleven larvae were observed in 2011 and two adults and ten juveniles were observed in 2012. Surveyors did not observe fish at these sites.

This SNLYF sites consist of at two ponds and a stream in a small basin approximately 1.2 kilometers southeast of Devil's Oven Lake. The sites are between 7500 and 7800 feet and drain into the outlet of Warren Lake. None of these sites are greater than three meters deep. This area is not part of the South Yuba River drainage but is included in this report due to its proximity to Paradise Lake.

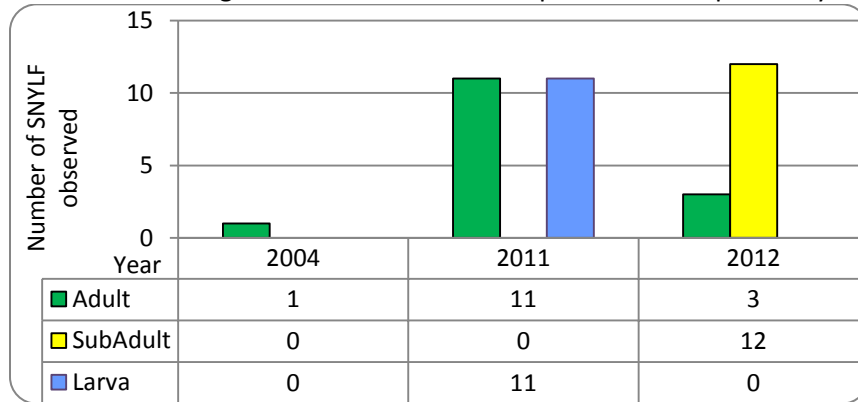


Figure 10: VES data by life stage at SE Devil's Oven Lake SNLYF sites in 2004, 2011 and 2012. Data was collected at two small ponds in all three years and in stream site 51049 in 2011 and 2012.

LITERATURE CITED

CA Department of Fish and Wildlife. 2012. *Aquatic Biodiversity Management Plan for the South Yuba River Management Unit*. Administrative Draft.

CNDDDB 2013. Accessed by S.Mussulman, CDFW.