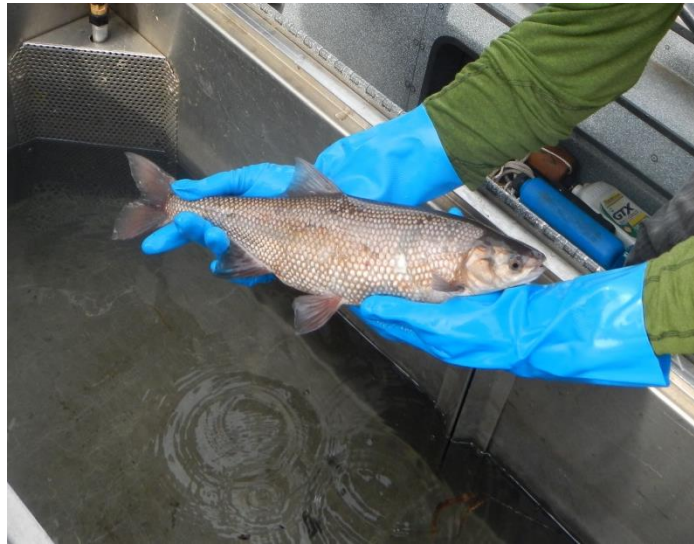


State of California
Department of Fish and Wildlife

2017 Clear Lake Hitch (*Lavinia exilicauda chi*) Visual Surveys on Clear Lake Tributaries



Ben Ewing
District Fisheries Biologist: Alpine, Amador, Calaveras and Lake Counties
Region 2

June 15, 2017

Introduction

In September of 2012, The Center for Biological Diversity submitted a petition to the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) to list the Clear Lake hitch (*Lavinia exilicauda chi*) (HCH-C) as a threatened and/or endangered species. This is pursuant to the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA)(Fish and Game Code, 2050). On August 6, 2014, a decision to list the species as threatened under CESA was made by the California Fish and Game Commission. Currently, the HCH-C is under status review by the USFWS to determine if the species warrants being protected by the ESA.

In late winter and spring of 2017, CDFW conducted visual surveys on seven tributaries to Clear Lake (Lake County) to monitor spawning HCH-C.

During the course of the 2017 visual survey, CDFW staff gathered data from various points along each tributary to help determine the relative number of HCH-C migrating upstream to spawn. This information, combined with previous data from the 2014 and 2016 surveys (Ewing 2014, 2016) and with future surveys at these exact locations will assist the CDFW with long-term management decisions regarding HCH-C.

Methods

The HCH-C visual survey began on March 15 and continued through May 24, 2017. During this period, CDFW staff conducted a total of eight surveys at a total of 22 sites on McGaugh Slough, Adobe Creek, Hill Creek, Kelsey Creek, Cole Creek, Manning Creek, and Thompson Creek (Table 1 and Figure 1). Start times ranged from 09:20 – 12:17 and end times ranged from 09:09 – 17:15. There is no Site 9. At each site, staff make an upstream and downstream visual count of HCH-C from a bridge crossing (except site 17, which had no bridge) as far as they could in each direction and document total HCH-C observed. The time it took to conduct a count at each site depended on the number of HCH-C observed. This sampling method was used to estimate the number of HCH-C seen in that body of water at that specific location in order to reduce the bias from trying to make counts on HCH-C from different points on the waterbody. HCH-C counts were ideally collected once a week from every site, but due to high flows, weather, and/or low water quality conditions, some or all sites would not be visited on a survey day (Table 2). Staff would record a start and stop time to complete the 22 site survey. Surveys began when the first sighting of HCH-C were reported to CDFW by residents of Lake County and end when HCH-C were no longer seen in the tributaries for approximately two weeks.

Table 1. GPS coordinates of visual survey sites.

Site	GPS Point	
1	39° 00' 53.82 N	122° 51' 42.62 W
2	39° 00' 15.26 N	122° 51' 46.10 W
3	38° 59' 36.44 N	122° 51' 41.64 W
4	38° 58' 57.04 N	122° 51' 44.58 W
5	38° 58' 43.98 N	122° 51' 47.31 W
6	39° 00' 53.69 N	122° 52' 14.55 W
7	39° 00' 15.57 N	122° 52' 23.71 W
8	39° 59' 37.67 N	122° 52' 39.56 W
10	39° 00' 40.42 N	122° 53' 44.99 W
11	38° 59' 51.86 N	122° 53' 38.75 W
12	38° 59' 37.21 N	122° 53' 34.48 W
13	38° 59' 51.50 N	122° 48' 53.75 W
14	38° 58' 31.37 N	122° 49' 40.57 W
15	38° 56' 33.05 N	122° 48' 55.47 W
16	39° 00' 39.15 N	122° 50' 07.38 W
17	38° 59' 49.98 N	122° 50' 38.09 W
18	38° 58' 55.84 N	122° 50' 36.87 W
19	38° 58' 42.59 N	122° 50' 34.07 W
20	38° 57' 15.73 N	122° 50' 19.63 W
21	39° 00' 40.52 N	122° 54' 01.30 W
22	38° 59' 54.97 N	122° 54' 28.49 W
23	38° 59' 54.36 N	122° 54' 45.17 W

Table 2. Visual Survey Sites and Dates Visited. X = Site Surveyed, NA = Site Not Surveyed.

Date: 3/15/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	x		

Table 2 Continued

Date: 3/29/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	x		

Date: 4/6/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	x		

Date: 4/18/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Upstream
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	x		

Date: 4/26 and 4/27/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	0	13	x	16	x	21	x
2	x	7	x	5	x	11	0	14	x	17	x	22	x
3	x	8	x			12	0	15	x	18	x	23	x
										19	x		
										20	x		

Table 2 Continued

Date: 5/3 and 5/4 2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	x		

Date 5/17/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	x	6	x	4	x	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	x	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	NA		

Date 5/24/2017

McGaugh Slough		Adobe Creek		Hill Creek		Thompson Creek		Cole Creek		Kelsey Creek		Manning Creek	
Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed	Site	Surveyed
1	NA	6	x	4	NA	10	NA	13	x	16	x	21	x
2	NA	7	x	5	NA	11	x	14	x	17	x	22	x
3	NA	8	x			12	x	15	x	18	x	23	x
										19	x		
										20	NA		

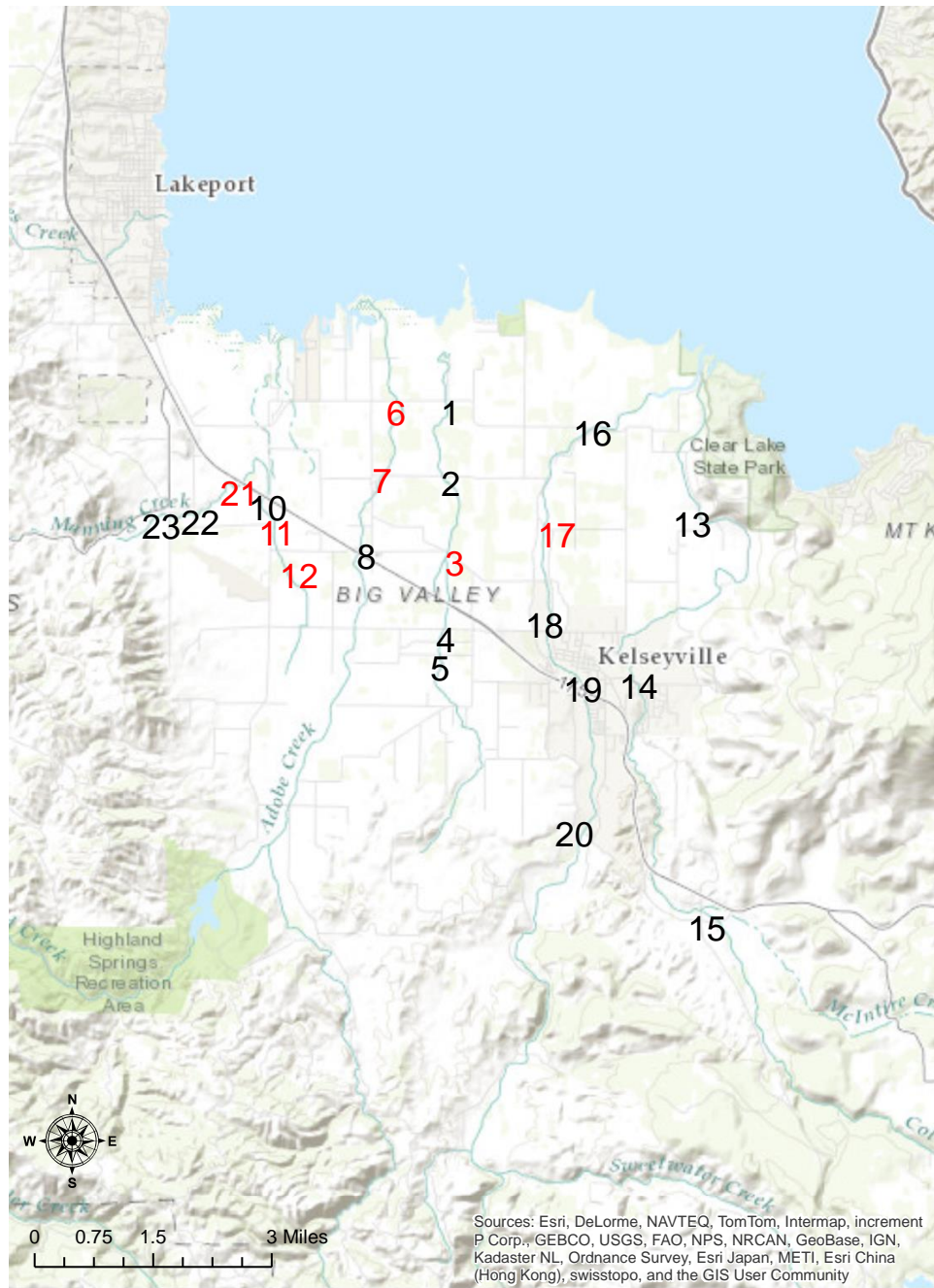


Figure 1. Visual survey sites on Clear Lake tributaries (Lake County, CA). Red colored numbers indicate sites where hitch were observed in 2017.

Results

A total of 517 HCH-C were observed during the 2017 survey, which is a notable decrease from the 1,119 and 693 HCH-C seen in the 2014 and 2016 surveys, respectively. Of the seven waterbodies surveyed, HCH-C were observed in Adobe, Kelsey, Manning, and Thompson Creeks (Adobe, Kelsey, Manning, and Thompson), plus McGaugh Slough (McGaugh). The greatest number of HCH-C seen were in Manning (n=293), which was far greater than what was observed in Adobe (n=139), Thompson (n=77), McGaugh (n=5), and Kelsey (n=3). Adobe, which seemed to be the most consistent and frequented tributary in both the 2014 and 2016 visual surveys, was second to Manning in 2017. All of the HCH-C observed in 2017 occurred from March 15 – May 3, 2017 (Figure 2).

All HCH-C seen in Manning were recorded at site 21 (Soda Bay Road Bridge Crossing). HCH-C were seen at all three sites (Soda Bay Road, Finley East Road, and Argonaut Road Bridge Crossings) in Adobe. All HCH-C seen in Thompson Creek were documented at sites 11 and 12 (Highland Springs/Matthews and Highland Springs/Argonaut Road Bridge Crossings). All HCH-C seen in McGaugh Slough were documented at site 3 (Big Valley/Argonaut Road Bridge Crossing). The three HCH-C seen in Kelsey Creek were documented at site 17 (Dorn Crossing).

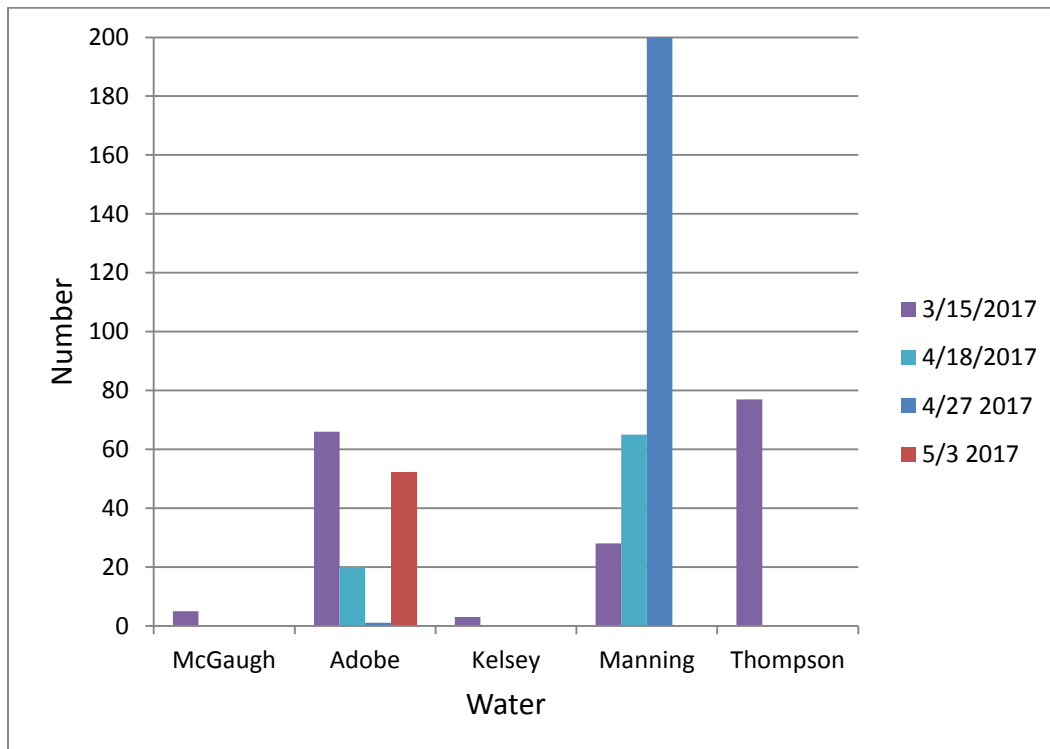


Figure 2. Number of Clear Lake HCH-C seen from McGaugh Slough, Adobe Creek, Kelsey Creek, Manning Creek, and Thompson Creek in 2017.

Discussion

High flows and turbidity during the historically wet winter of 2016/2017 may have made viewing HCH-C in the creeks difficult. Although HCH-C detections declined in 2017 when compared with the 2014 and 2016 surveys, HCH-C were seen in more waters than either the 2014 (n=2) or 2016 (n=3) surveys. The high and/or consistent flows in the numerous tributaries to Clear Lake may have played a role in the number of HCH-C choosing to move upstream from the lake to spawn. With numerous tributaries holding more water in 2017 compared to 2014 and 2016, HCH-C may have been more widely dispersed throughout the watershed. CDFW staff heard numerous reports that the HCH-C spawning run was very poor in 2017, with very few seen in any tributary to Clear Lake. Although the high flows and turbidity may have prevented people from observing many HCH-C, the four year drought may have resulted in low reproductive output and poor recruitment, the effects of which now are being observed.

In spring of 2018, CDFW will continue to sample the same 22 sites. Additionally, CDFW will continue investigating reports of HCH-C sightings in other areas of the Clear Lake watershed.

Literature Cited

- Ewing, B. 2014. 2014 Clear Lake Hitch (*Lavinia exilicauda chi*) Visual Surveys on Clear Lake Tributaries. Region 2 Fish Files. California Department of Fish and Wildlife. Unpublished.
- Ewing, B. 2016. 2016 Clear Lake Hitch (*Lavinia exilicauda chi*) Visual Surveys on Clear Lake Tributaries. Region 2 Fish Files. California Department of Fish and Wildlife. Unpublished.