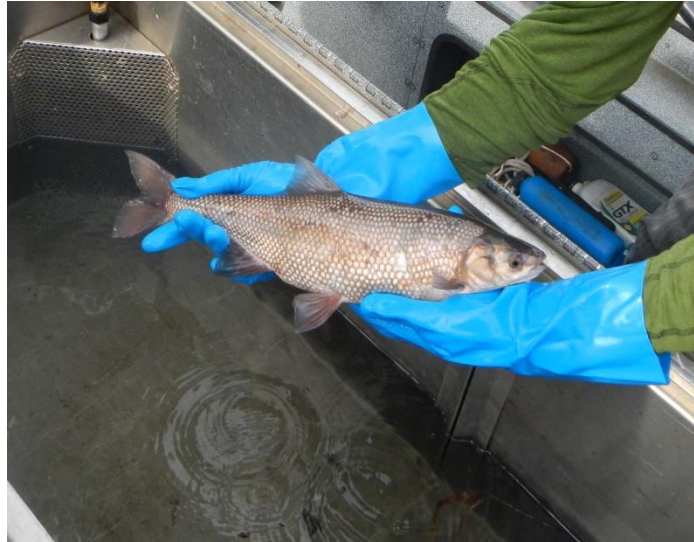


State of California
Department of Fish and Wildlife

2018 Clear Lake Hitch (*Lavinia exilicauda chi*) Visual Surveys on Clear Lake Tributaries



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Region 2

August 3, 2018

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 2018, CDFW conducted visual surveys on seven tributaries to Clear Lake (Lake County) to monitor spawning HCH-C.

During the course of the 2018 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, 2016 - 2017 surveys (Ewing 2014, 2016, 2017) 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 19, 2018 and continued through May 16, 2018. During this period, CDFW staff conducted a total of nine surveys at 21 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 08:24 – 13:22 and end times ranged from 12:39 – 16:42. There is no Site 9 or Site 20. At each site, staff made 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 documented the 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, all sites were not visited on every scheduled survey day (Table 2). Staff recorded a start and stop time to complete the 21 site survey. Surveys began when the first sighting of HCH-C were reported to CDFW by residents of Lake County and ended when HCH-C were no longer seen in the tributaries for approximately two weeks.

Table 1. GPS Coordinates of sites visited for visual surveys.

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
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: 3/19/2018

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		

Date: 3/28/2018

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

Table 2 cont.

Date: 4/3/2018

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		

Date: 4/11/2018

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		

Date: 4/16/2018

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		

Date: 4/25/2018

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		

Date: 5/1/2018

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		

Date 5/9/2018

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	NA	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	NA	8	x			12	NA	15	x	18	x	23	x
										19	x		

Date 5/16/2018

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	NA	10	x	13	x	16	x	21	x
2	x	7	x	5	x	11	x	14	x	17	x	22	x
3	NA	8	x			12	NA	15	x	18	x	23	x
										19	x		

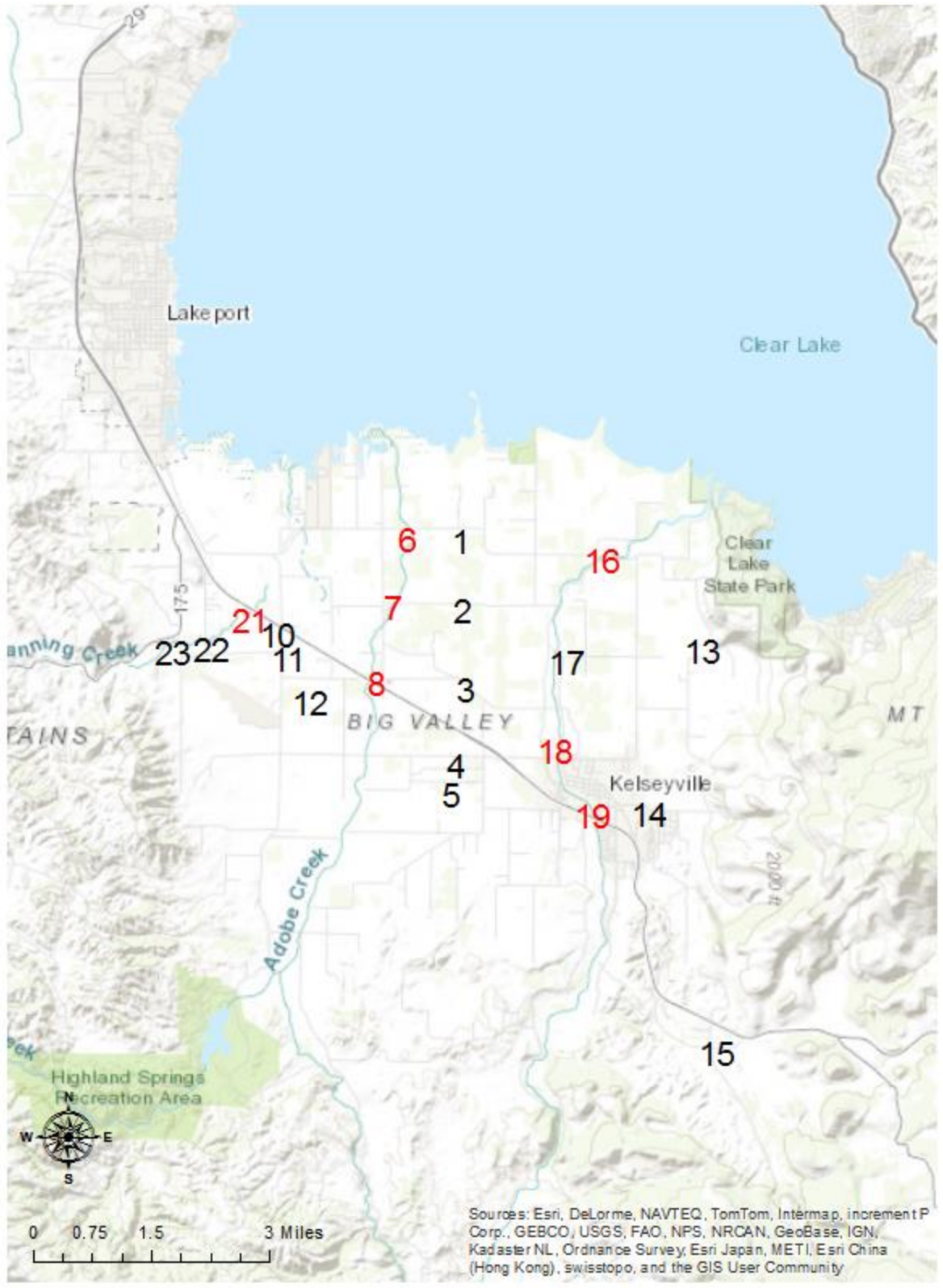


Figure 1. Visual survey sites on Clear Lake tributaries (Lake County, CA). Red colored numbers indicate sites where hitch were observed in 2018.

Results

A total of 1,153 HCH-C were observed during the 2018 survey, which is an increase from any prior year (2017; n= 517), (2016; n=693), (2014; n=1,119). Of the seven waterbodies surveyed, HCH-C were observed in Adobe, Kelsey, and Manning Creeks (Adobe, Kelsey, and Manning). The greatest number of HCH-C observed were in Adobe (n=718), which was greater than what was observed in Kelsey (n=433) and Manning (n=2). Adobe was the most frequented tributary in 2018 as well as the 2014 and 2016 visual surveys (Ewing 2014 and 2016). All of the HCH-C observed in 2018 occurred from March 28 – April 25, compared to March 15 – May 3 in 2017 (Ewing 2017) (Figure 2).

All HCH-C seen in Manning were recorded at site 21 (Soda Bay Road Bridge Crossing) for a second consecutive year. HCH-C were also seen at all three sites (Soda Bay Road, Finley East Road, and Argonaut Road Bridge Crossings) in Adobe for a second consecutive year. The 433 HCH-C seen in Kelsey Creek were documented at sites 16, 18, and 19 (Soda Bay Road, Merritt Road, and Main Street Bridge Crossings).

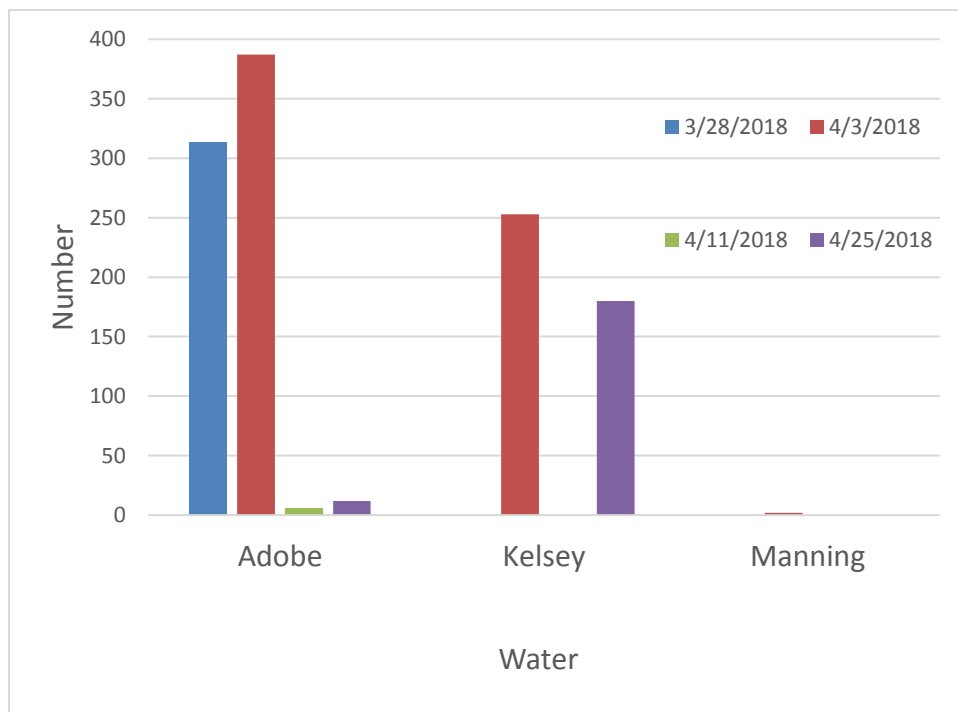


Figure 2. Number of Clear Lake HCH-C seen from Adobe Creek, Kelsey Creek, and Manning Creek in 2018.

Discussion

An above average total rainfall with consistent flows and low turbidity during the wet season may have made viewing HCH-C in the creeks easier. Although HCH-C detections

increased in 2018 compared to any previous surveys, HCH-C were only seen in three of the seven waters surveyed. There were high and/or consistent flows in numerous tributaries to Clear Lake, which may have played a role in the record number of HCH-C choosing to move upstream from the lake to spawn. It is unknown why HCH-C were not seen in any of the other four waters since the other four waters surveyed had high and/or consistent flows as well. Additionally, CDFW staff did not have reports of HCH-C spawning in any of the tributaries to Clear Lake in 2018, suggesting HCH-C were not using those tributaries.

In spring of 2019, CDFW will continue to sample the same 21 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. <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=89711>

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