

Abbreviated Observations of Fish Migration, Fish Species, Available Habitat, and Additional Wildlife in Northshore Tributaries, Clear Lake Basin, Spring 2021

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This year, performing field work similar to previous years was not possible. Information offers only an indication of overall habitat and fish populations. There are short summaries of brief observations specific to a time and location.

Summary

Observations occurred on 5.May, 13.May, 27.May, and 10.June in northshore tributaries of Clear Lake, for potential sightings of Clear Lake Hitch, *Lavinia exilicauda chi*, during migration, spawning, and passage of juveniles downstream. No hitch were seen. Four of the usual five locations were monitored. Please refer to the map on pg. 3 for all five locations. The Middle Creek North location was not monitored, the Elk Mountain Road/Clover Creek location was not surveyed after 27.May as the creek had dried, and the Rancheria Bridge location was visited only three times. In current drought conditions, creeks were flowing but never full. Flow appeared to be fairly rapid for early May when observations were begun, likely due to runoff from the watersheds' hydrophobic soil from the 2018 Ranch fire.

No migrating adult fish were seen. On four occasions at the Middle Creek South location, relatively few juveniles identified as Sacramento suckers, *Catostomus occidentalis*, were noted. They ranged from 2.0 to 4.0 cm TL and were identified using TL, coloration, body style, eye and fin placement, and caudal fin. These differ from Clear lake hitch in larval and early juvenile stages, especially TL. No other species were noted during this late monitoring; Clear Lake hitch have appeared to migrate in northshore tributaries generally later in spring than Sacramento suckers.

Water levels in all creeks fell quickly after rain events temporarily, and briefly, raised them. Levels were never high this year, and they fell precipitously or disappeared when agricultural irrigation began. Levels in Tulelake remained stable because an agricultural easement exists, but they were never high and were already remarkably low when observations began.

People were not encountered this year during observations, and wildlife that might have been affected by their presence was not as abundant as in previous years. On observation days rain or substantial wind did not occur and would not have influenced wildlife.

Gravel bars, instream grasses and riparian vegetation grew and expanded exponentially even during the limited observations. Instream algae grew on creek substrates, at water's edge, and formed dry mats on exposed creek banks. Adequate fish passage could still be found in side and/or center channels that decreased rapidly in width and depth. Fish passage existed but was becoming precarious by 10.June, the last day of observations. There was none on 27.May at Clover Creek at Elk Mountain Road.

Lower water levels overall and unusual spring weather patterns with unusually warm early temperatures, then falling temperatures, plus brief thunderstorms might have discouraged a hitch migration event this spring, but exact triggers aren't known. Given the ephemeral nature of Clear Lake tributaries, opportunism is clearly important. Research in 2010 indicated that juvenile hitch in rice paddies with several other species were the only species to head toward, not away from, a small opening through which water flowed downstream.

Methods

The same methods for collecting field data have been used since 2013, at the same locations, using the same field sheets, allowing for consistency over time. Methodology followed that general pattern but was shortened with far fewer monitoring days.

The first day of monitoring normally includes recording GPS coordinates, descriptions of immediate and peripheral vegetation, substrate, creek and bank degradation, aquatic, horizontal, and vertical habitat, and significant features in the environment. Creek bank degradation is

estimated as a function of *current* creek banks that are a part of levees, and at the Tullake location, a pool below a small dam at the southeastern end of Tullake. Because this year's monitoring was impacted, last year's GPS coordinates were substituted and initial descriptions limited. For more descriptions, see observations from 2013 to 2020 (at www.rootlets.com/enviromment/hitch.html).

Numbers and TL of fish at all locations were estimated as accurately as possible. Fish were not removed from streams to be examined and measured. At each observation event at each location, field notes included but were not limited to fish counts, estimates for water depth, flow, and clarity all of which were impacted by storm events, cloud cover, wind speed and direction, ambient air and water temperatures, wildlife heard, seen, in flight, on and in water, and evidence of its presence including scat, tracks, paths, bowers, hollows, disturbed brush or grasses, and other changes in the environment. If wildlife were able to be identified accurately by sight or vocalization, this was noted. This year, ever-present individuals were recorded, and unidentified individuals belonging to large groups such as passerines were counted in that manner. Please see summaries for each location visited.

Wind speed and direction, along with gusts, were estimated. Wind direction at the five locations can and does vary due to weather, biogeography, and geomorphology. With cloud cover, estimated highs and lows for wind speed were graphed including estimated directions and times. Graphs are minimal, with a shorter period of time for monitoring and already warm temperatures.

Near creek banks water is shallow and in a main channel, deeper. Depth was estimated using permanent reference points on creek banks and in channels. Both deep and shallow estimated depth and flow were graphed. Water levels in these streams can vary quickly and considerably from runoff and from drawdown for crop irrigation. Flow was estimated at a center point instream by timing the movement of light surface debris, inexact but consistent over time.

Access to the creek is posted and denied at the Rancheria Bridge site, and water temperatures could not be monitored. At Tullake this spring, water was so low it could not be reached. This year, the bank there was precipitous.

At all locations during and after rain events, water clarity was diminished, silt load increased, and there was surface debris. All of this was minimal this year. Water clarity was fair to good this year with the exception of the Tullake site, where water was always green-brown to opaque with varying degrees of translucence. As temperatures warmed and water levels dropped, several species of algae spread on substrate. Surface mats were small or had not formed when observations ended.

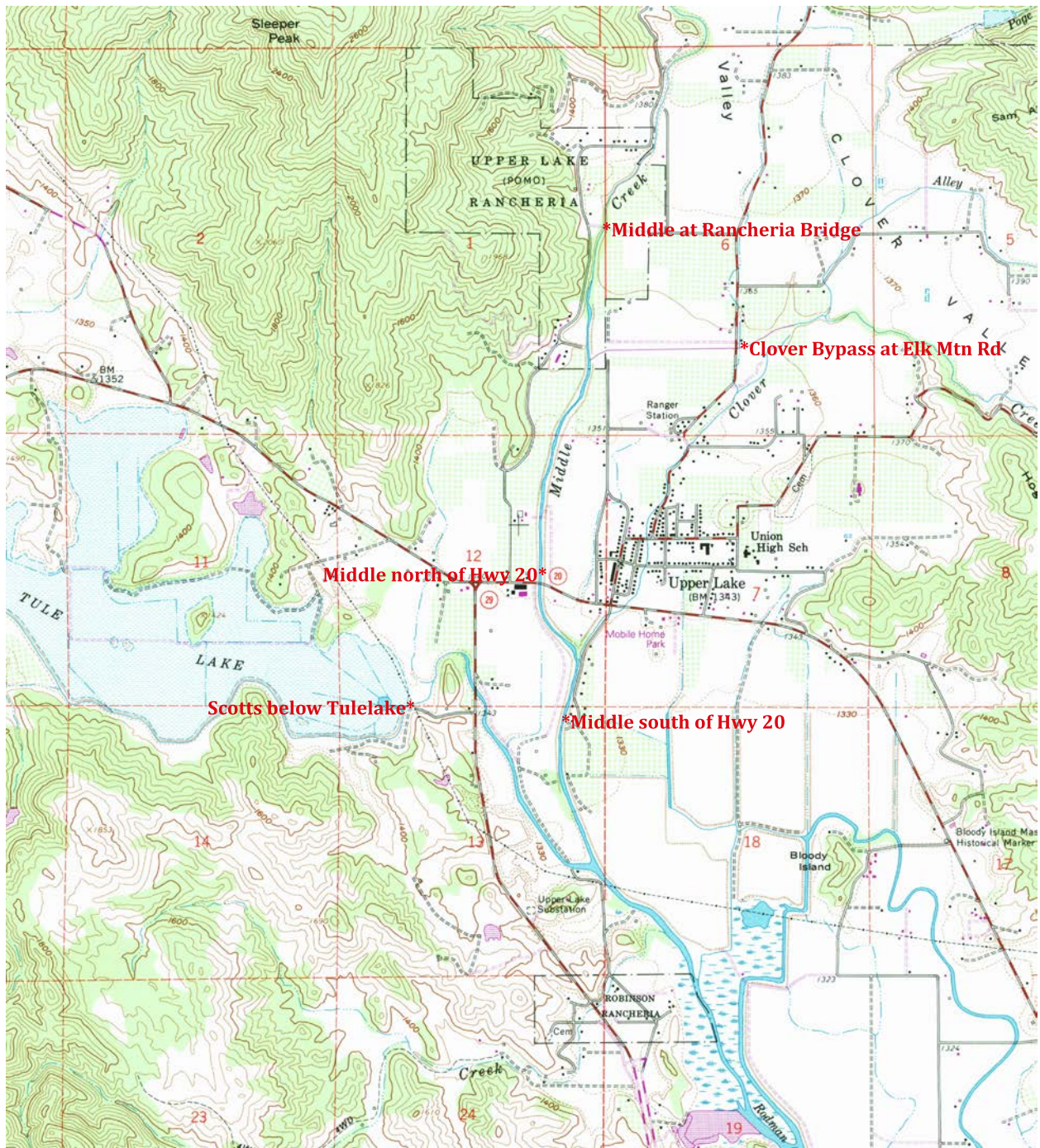
Monitoring normally required 2 to 2.5 hours to complete. Counts were based on observation rather than timed intervals. Digital images were taken at each location, each observation day, with care to similarity for angle and approach, in order to note small changes in the environment digitally, in addition to field sheets.

Monitoring ceased after water levels subsided, fish passage was limited limited or gone, juvenile fish were few or absent, and no migrating adults had been seen.

Equipment

Equipment consisted of an Olympus digital camera, a DeLorme Earthmate PN-60, and a Cooper handheld digital thermometer with extension. Among resources consulted were Google Earth Pro 7.3.3.7699 (64-bit), a Jepson manual (University of California Press, ©1993), the Guide to the Coastal Marine Fishes of California (Daniel J. Miller and Robert N. Lea, California Fish Bulletin Number 157, Department of Fish and Game, State of California, 1972), the Handbook to the Orders and Families of Living Mammals (Timothy E. Lawlor, 2nd ed., Mad River Press, Rt. 1, Box 151-B, Eureka, CA 95501, 1979), A Field Guide to Mammals, North America north of Mexico (William H. Burt, and Richard P. Grossenheider, Peterson Field Guides, 3rd Ed., Houghton Mifflin Co., Boston, New York, ©1980), and the Field Guide to the Birds of North America (2nd Ed., National Geographic Society).

Monitoring Locations



Map derived from a portion of quadrangle map, Upper Lake, CA 39122-B8-TF-024, courtesy of United States Geological Survey, in cooperation with California Department of Water Resources; Control by USGS, NOS.NOAA, and USCE, compiled from imagery taken 195

Scotts Creek below Tulelake Dam

From 2020: N 39° 9.9067', W 122° 55.1711' elev. 1330

Adult fish migrating upstream from Clear Lake and juveniles returning downstream travel to this area via Scotts Creek. Tulelake was included in an agricultural easement and normally has water and manmade islands the year around, but this summer it is dry. Fish migrate over the dam above the pool when water levels are high, or through a culvert from the pool into a diverted Scotts Creek, entering Tulelake above the lake or at places along the diverted channel.

Water clarity at this location is always opaque at best, translucence varies, and one can only see and at least partially identify juveniles that are clustered and migrating downstream near water's edge at the observation point. No juveniles were seen this year. Adult fish were spotted jumping or their presence was detected due to ripples.

The dam was not under water this year and was a partial barrier. It does have a small opening that allows fish passage. It is a gathering site for predators, including larger fish that converge when prey gather above or below it.

There is horizontal and vertical riparian habitat; the pool is surrounded by tules, shrubs, trees, and understory. Adjacent hills are primarily oak woodland.

Water levels and flow were estimated for the pool below the dam. Scotts Creek continues toward Rodman Slough from this pool.

Wildlife sightings and vegetative growth normally increase with warming temperatures, but monitoring began only in early May and days were already warm. Light storm systems, wind, and cloud cover affected wildlife movement. Wildlife was noted as heard, in or on water, in flight, and seen generally on a bank, a berm, a branch, the dam, or the ground. With this year's timing, wildlife movement was limited.

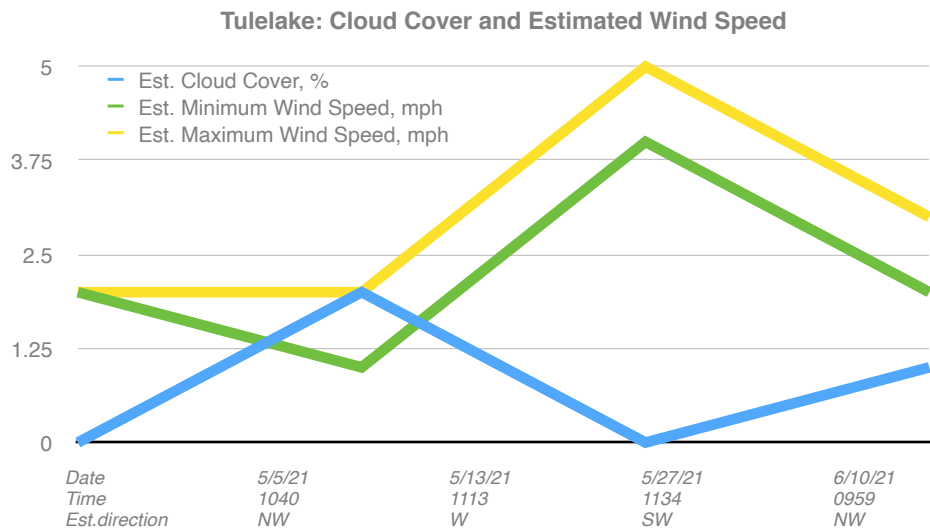
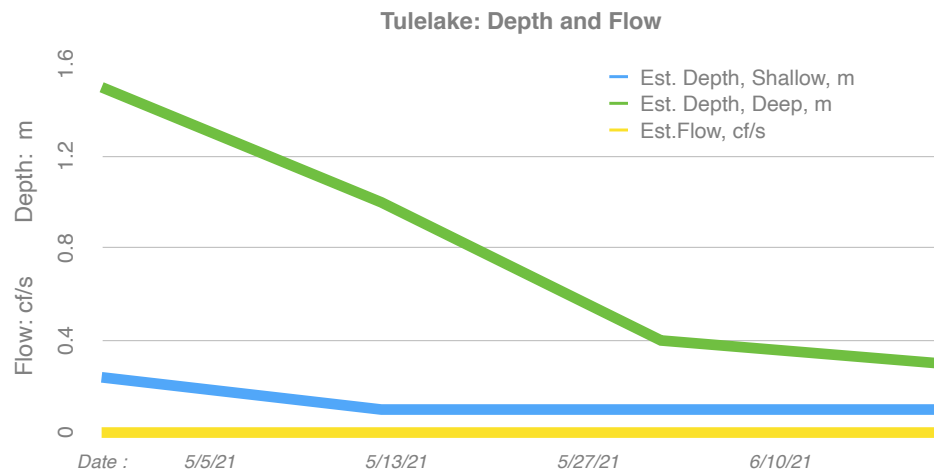
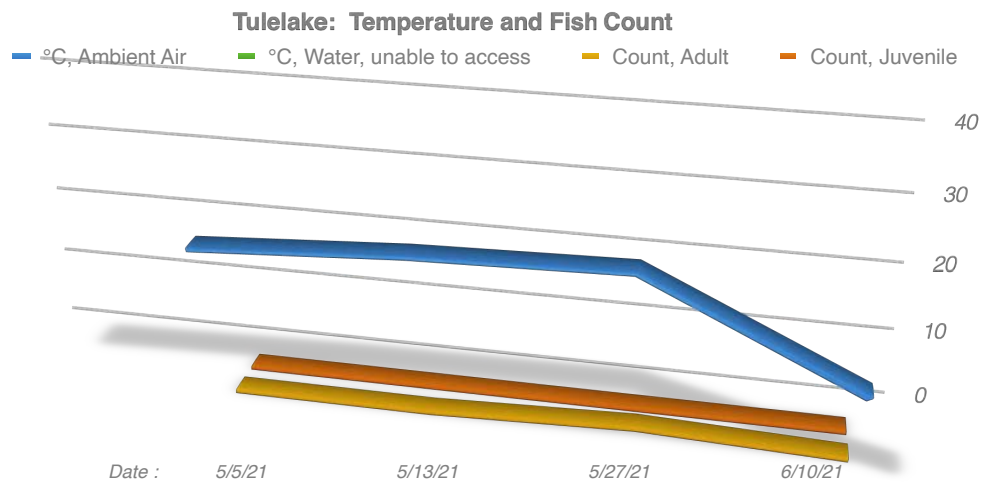
*Observations occurred once at the edge of the the pool below Tulelake Dam and further at a point on the edge of an access road immediately above.



5.13.21, 1113



6.10.21, 0959



Tulelake: Brief Summary of Fish Count, Wildlife, and Immediate Environment

5/5/21 1040		5/13/21 1113
Vegetation: poplar <i>sp.</i>, willow <i>sp.</i>, ruderal grasses, herbaceous shrubs and plants, Himalayan blackberries, wildflowers in bloom Habitat: vertical and horizontal, riparian herbs, shrubs, trees, oak woodland and dried grasses beyond immediate site Substrate: 10% cobble, 10% gravel, 5% sand, 75% silt Bank degradation ~80%	Water: brown, cloudy, slight ripples from breeze, no ripples from life in or on water Unable to see any fish Heard: Acorn woodpecker, passerines, crows In flight: 2 crows, insects, 2 butterflies, grey squirrel On water: no wildlife observed	Water: brown, muddy, opaque, level lw Numerous logs and trash strewn about the area Fish: 1 large, jumping above dam; 1 large turtle in pool; Heard: black crowned night heron, acorn woodpecker, passerines, western grebes Seen: 2 great white egrets on berm Flight: 2 passerines, male mallard, 2 crows, 8 Canada geese, 1 great blue heron
5/27/21 1134	6/10/21 0959	
Water brown, opaque; no surface debris No fish, but 1 set of ripples Heard: 2 acorn woodpeckers, crow, loggerhead shrike Flight: passerines, 1 pelagic cormorant, 5 crows, great blue heron, 1 turkey vulture, 1 golden eagle On water: pelagic cormorant, western grebe, 2 Canada geese Seen: pelagic cormorant Observation: more wildlife and predators than previous week	Water green-brown, opaque, levels markedly down; ripples only from wind No fish seen; Heard: acorn woodpecker, ag sprayer, Brewer's blackbird, passerines Seen: 5 pelagic cormorants taking flight On water: 1 pelagic cormorant Flight: 2 great blue herons, 2 crows, 2 Canada geese	

Middle Creek South

From 2020: N 39°9.4648", W 122°54.8602" elev. 1332

Migrating adult fish and returning juveniles pass this location on Middle Creek. Timing of abbreviated monitoring this year was late in the migration season for adults migrating upstream, but juvenile Sacramento suckers, *Catostomus occidentalis*, were observed on each day of monitoring.

On the eastern bank, riparian vegetation lines the channel and extends roughly 50 feet to the second tier levee bench, where ruderal grasses, wildflowers, and vetch grow to the levee top, Bridge Arbor Road. The western bank also supports a narrow, steep strip of riparian vegetation between the channel and a dirt road that tops the levee. Horizontal and vertical habitat exists along this stretch of Middle Creek. To the east, the levee protects homes, orchards, and vineyards. To the west, the levee protects a pear orchard and a home further south.

Water in the channel was clear with low levels, as there were few storm events this spring. Instream gravel bars were increasingly exposed. Fish passage narrowed but was adequate for small juveniles migrating downstream. Moss and algal mats grew on substrate and along banks, and were exposed and dried as water levels receded.

Habitat for wildlife is vertical to at least 60 feet with thick **understory**, horizontal about 50 feet to the first levee tier to the east, and the narrow strip of vegetation to the west for about 10 to 20 feet. Wildlife sightings were minimal this year.

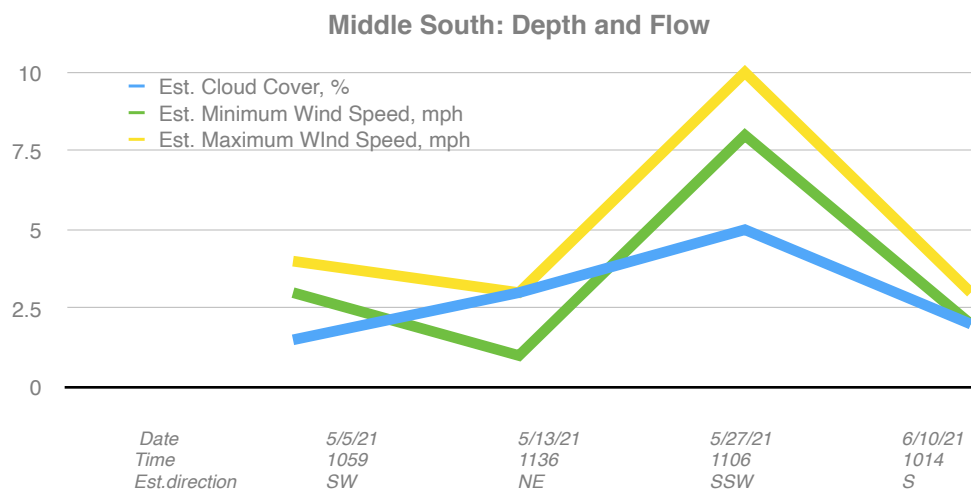
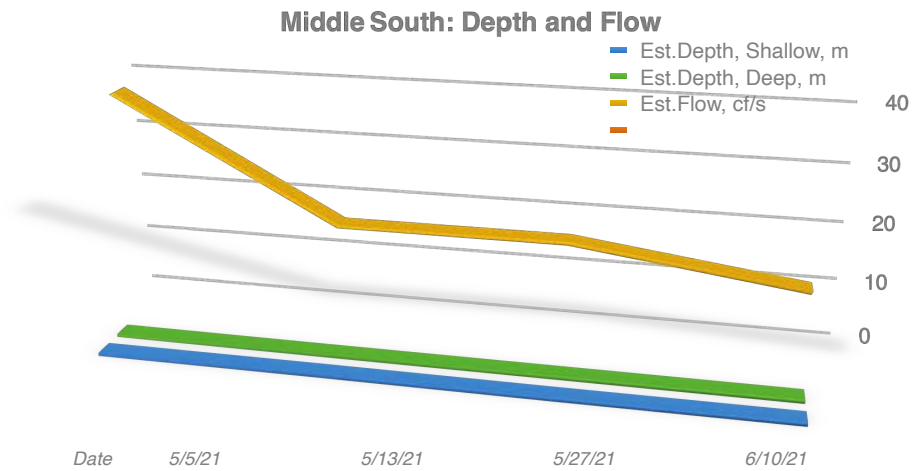
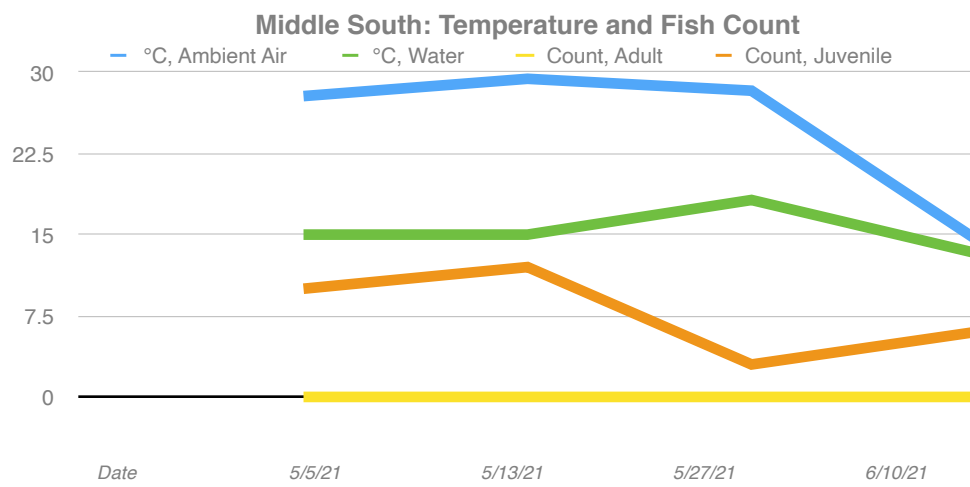
Wind, rain, and cloud cover were for the most part absent during monitoring. Water temperature was taken near the creek bank where juvenile fish were seen.



3.6.2020, 1005



5.22.2020, 1005



Middle Creek South: Brief Summary of Fish Count, Wildlife, and Immediate Environment

5/5/21		5/13/21
Vegetation: invasive grasses instream, riparian herbs, mugwort, mugwort, ruderal grasses, willow sp., poplar sp., California bay laurel lining east and west creek banks - strip of vegetation ~20 ft. On western bank and roughly 50-60 ft on eastern bank, Himalayan blackberry, wild mustard, California poppies in bloom Habitat: 10-85 ft. vertical habitat, horizontal habitat of grasses, shrubby growth including Himalayan blackberries and herbs; instream gravel bars and grasses, algae instream, on substrate, and dried creek bank; odor of decay Substrate: 10% cobble, 40% gravel, 25% sand, 25% silt Bank degradation ~50%, dictated by levee	Leveed stream with orchards on either side Water: clear, levels extremely low 10 2-4 cm juvenile Sacramento suckers Heard: American crow, passerines, mourning dove, American robin Seen: passerines, 2 crows, ground insects In flight: cliff swallows, bees, butterflies, flying insects In water: aquatic insects	Water clear; algae on substrate, grasses instream, water level greatly decreased - irrigation upstream 12 juvenile Sacramento suckers 1.75-4 cm, Heard: Acorn woodpecker, cricket, Nuttall's woodpecker, numerous passerines, northern mockingbird Seen: ants, passerines, skunk tracks In flight: 2 butterflies, flying insects, 2 California towhees, Nuttall's woodpecker, turkey vulture, seeds
5/27/21	6/10/21	
Water: clear, surface debris, algae on substrate and on creek bank, some instream plants developing and growing In bloom: morning glory, Himalayan blackberry, California poppies, small purple wildflowers; grasses heading out and drying 3 3-4 cm juvenile Sacramento suckers Heard: passerines Seen: passerines, mink tracks In flight: 2 swallowtail butterflies, flying insects, American crow, passerines, grasshopper On water: pelagic cormorant	Water: clear, levels down, algae on substrate, surface, and creek banks instream plants and herbs developing Dried grasses and morning glory in bloom 6 juvenile Sacramento suckers 3.5-4 cm Heard: traffic, crow, passerines, Acorn woodpecker, plane Seen: green-backed heron, skunk tracks, dog scat In flight: flying insects, 2 passerines, cliff swallows, 30-40 California towhees	

Middle Creek at Rancheria Bridge

From 2020: N 39° 10.9495', W 122° 54.7975' elev. 1376

Observations took place on three of four monitoring days at this location.

Monitoring occurs here on a bridge over Middle Creek, on Rancheria Road. Migrating adult fish are normally easily observed instream to the south and north, but access to creek banks is posted. In several earlier years, adult Sacramento suckers, *Catostomus occidentalis*, and larger suckers with vibrant coloration, distinctly differing in coloration and TL, have been observed migrating upstream, below and above the bridge. They were observed in individual schools. Juvenile rainbow trout normally come downstream and cluster north of the bridge apron.

The channel is set close to hills to the west, with primarily oak woodland, madrone, manzanita, white pine, and shrubs, grasses, and herbaceous growth. It is contained by a levee to the east with orchards and vineyards beyond. Poplar, willow sp., bay laurel, and white alder line the creek itself, providing shaded areas and woody growth. Several miles upstream, the creek forks into Middle Creek West and Middle Creek East which continue many miles further.

Historically hitch migrated and spawned over several miles north of Rancheria Bridge (anecdotal information, pers. communication). Four weirs were constructed south of Rancheria Bridge late last century to deter graveling, braiding, and silt deposition (public information). The lowest weir at the confluence of Middle Creek and Clover Bypass silted over time and does not appear to be a barrier for hitch, as in 2009, four or five were seen above the first (lowest) weir in Clover Bypass that branches off Middle Creek (pers. observation). The weir immediately below the bridge has a reach for fish to jump but offers rough fish passage near one bank. Large boulders in the two remaining weirs downstream appear to be barriers for hitch (pers. observation).

In 2004 a feed ball of threadfin shad, *Dorosoma petenense*, was seen in a pool below the first weir. Hitch have not been seen in this stretch of the channel, above the lowest weir, since monitoring began in 2011 and had not been seen before that from 2004 to 2008 (pers. observation). From 2008 to 2010, this area of Middle Creek was not personally checked for hitch.

Riparian vegetation offering horizontal and vertical habitat lines both sides of the channel, quiet and shallow above the bridge apron but flowing quickly over the apron and first weir. Woody debris creates small, protected areas instream near banks. Gravel banks that form above and below the bridge were quite exposed. Water was clear.

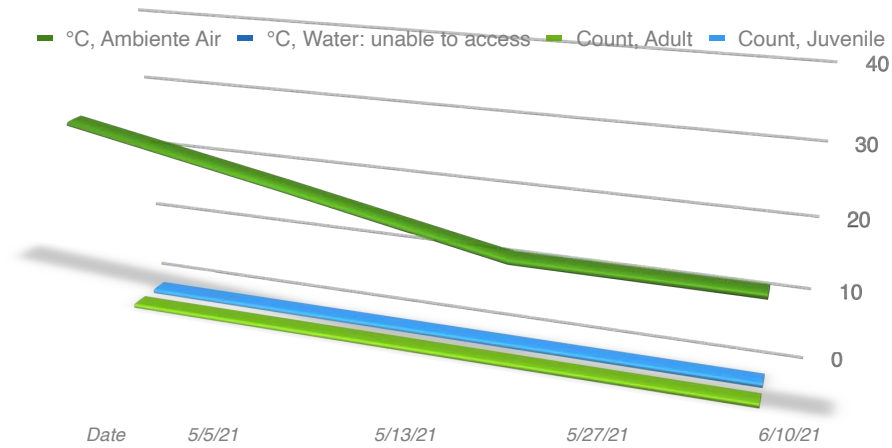


5.13.2021, 1204

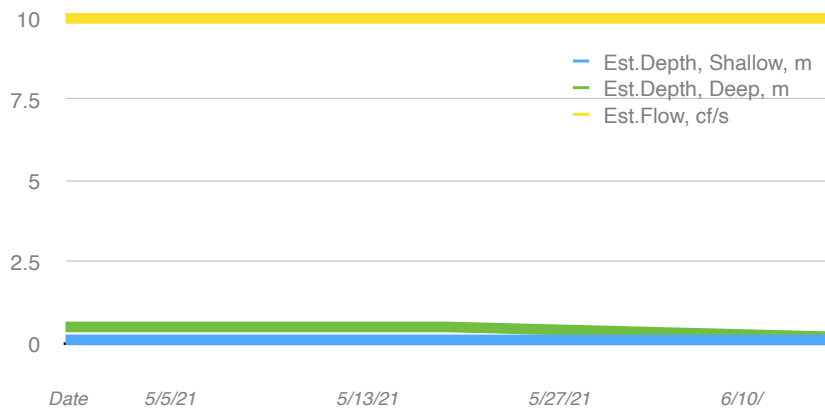


6.10.21, 1043

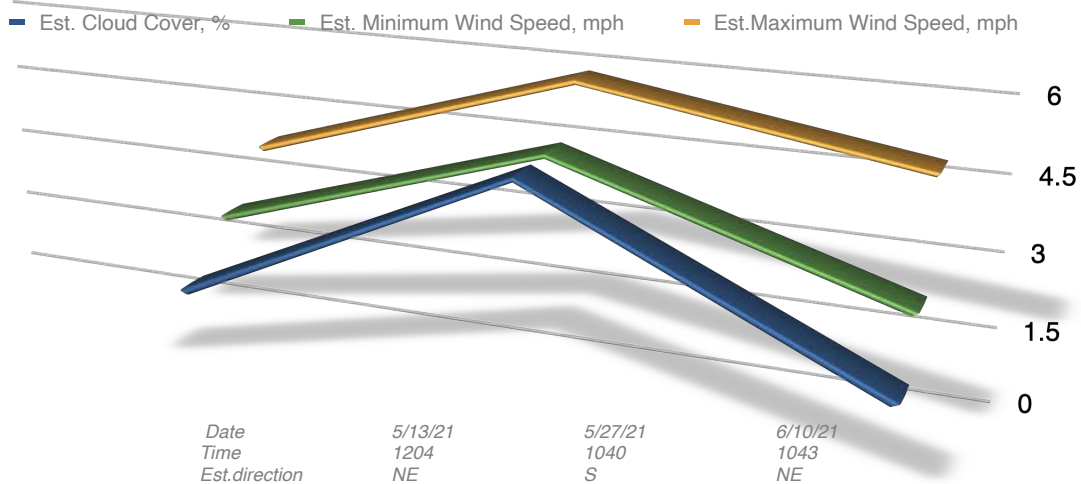
Middle at Rancheria Bridge: Temperatures and Fish Count



Middle at Rancheria Bridge: Depth and Flow



Middle at Rancheria Bridge: Cloud Cover and Estimated Wind Speed



Middle Creek at Rancheria Bridge: Brief Summary of Fish Count, Wildlife, and Immediate Environment

5.13.21		5.27.21
Vegetation lining the immediate creek bank: riparian growth of willow sp., white alder, poplar, California bay, Himalayan blackberries, herbaceous plants and shrubs, dry ruderal grasses past bloom near the top of the levee, wildflowers including wild mustard Leveed channel: hills with oak woodland, white pine, shrubs, grasses to the west, walnut orchards to the east Habitat: 5-60 ft. vertical habitat, horizontal habitat of grasses, shrubby growth, broad gravel bars instream, woody growth and some debris instream and along banks, bridge apron on the south side of the bridge, the first of 4 weirs ~15 ft. downstream of the apron	Substrate: 15% cobble, 10% gravel, 55% sand, 20% silt Bank degradation ~35% Water: clear, large, exposed gravel bar to the north of the bridge; grasses, algae, woody debris instream Seeds dispersing in air, vetch in bloom, burned trash immediately off road before bridge No fish seen Heard: passerines, American robin, cliff swallows In flight: insects, butterfly, cliff swallows, numerous passerines, Brewer's blackbird, American crow Cliff swallows nesting under bridge	Water: clear, low levels, algae on substrate and surface, herbs and sedges developing instream No fish seen Heard: water, passerines, cliff swallows, American robin, traffic In flight: butterfly, insects, cliff swallows
6.10.21		
Water: clear, surface debris, algae on substrate and surface, heavy in stream plant growth, limited fish passage Morning glory in bloom, grasses dry and seeded No fish seen Heard: water, frog, passerines, cliff swallows In flight: cliff swallows, red shouldered hawk, passerines		



Middle Creek above Rancheria Bridge, 6.10.21, 1043

Clover Bypass at Elk Mountain Road

From 2020: N 39° 10.5621', W 122° 54.1750' elev 1368

This year's observations did not take place in the particular location used in previous years. They were made from a view of this location. There were extremely low water levels on the first monitoring day and no water on the second. Normally at this site juvenile Sacramento suckers head downstream until monitoring ends, generally in early June.

The monitoring spot at this site is slightly under a bridge that crosses Clover Bypass, the channel that results from the confluence of Alley and Clover Creeks to its own confluence with Middle Creek. The channel is leveed with broad benches on north and south sides. In 2005 it overtopped, and parts of Upper Lake were under water (pers. communication, pers. observation). Water levels from storm events rise and fall quickly here, and water can entirely disappear in late spring especially after the onset of irrigation.

Fish migrating up Middle Creek and juveniles returning downstream have generally been seen here. A barrier for fish passage where Clover Bypass enters Middle Creek often occurs from braiding and piles of debris from winter storms. That area is posted and cannot be accessed to check for potentially stranded fish.

The stream is not deep or wide after storm runoff subsides. Flow and clarity are normally fair. In recent years riparian shrubs and herbs have created a thick understory near banks, and occasional trees or small groupings of trees have provided intermittent shade. Grasses and shrubs cover broad sloping levee banks. Access roads form their tops.

Grasses and herbaceous vegetation were thick and dry on levee shelves and near creek banks. Minimal vertical habitat, about 3, to 8, to 15 feet, from riparian vegetation, was noted downstream and upstream, however shrubby vegetation and young trees, willow sp., had taken root along banks and had grown quickly, providing more instream habitat and shady niches than was previously available. There were pronounced gravel bars from channel braiding this year.

Beyond the northern and southern levee shelves are homes, vineyards, and orchards. Levee benches are essentially open, covered with grasses, with paths that lead down to the creek. Leveed tributaries in the northshore are wildlife corridors (pers. observations past and present).

from 2020



5.8.2020, 1006

2021, from the opposite side



5.13.2021, 1219

Clover Bypass: Brief Summary of Fish Count, Wildlife, and Immediate Environment

5/13/2021, 1219	5/27/2021, 1053
Observations did not occur at water's edge. Water that was seen from a distance was clear, with a heavy growth of algae on surface and substrate. There were numerous plants instream, the creek was nearly dry, almost completely occluded by vegetative growth. Water levels low; nearly no water for fish and extremely limited fish passage Heard: passerines, California quail, Brewer's blackbird. Red-winger blackbird, cliff swallows In flight: cliff swallows, insects, seeds in air Est. cloud cover%: 3 Est. wind, mph: 4-5 S T, °C, ambient air: 26.6 T, °C, water: unable to access Est. depth, water, m: 0.05-0.1' Flow, cf/s: 5	Observations did not occur at water's edge. From the road: The creek is dry. No water was seen from the bridge, looking NE and looking SW; unnecessary to return; unable to reach site on stream bank and unable to see bank due to thick growth. Grasses dry with seed heads Heard: passerines, cliff swallows In flight: mourning dove, cliff swallows Est. cloud cover, %: 4 Est. wind, mph: 5-7 S T, °C, ambient air: 21.6 T, °C, water: unable to access Depth and flow of water: n/a

Clover Bypass from levee top, north



Clover Bypass upstream of bridge
5.13.21



Middle Creek North

From 2020: N 39° 9.8408', W 122° 54.9685' elev. 1339

*The Middle Creek north location was not monitored this spring. Below is a description for general information.

This location is north of a bridge over Middle Creek on Hwy 20. Access to the site is on the east side, along the broad levee bench there, across open meadow, and through riparian habitat lining Middle Creek. A pear orchard is east of the levee. Across the creek to the west, a narrow, less gentle incline reaches the top of the levee. Residences and orchards are beyond. Adult fish migrating upstream in Middle Creek and juveniles returning downstream pass this location. This year, adult Sacramento suckers must have migrated upstream and juveniles have returned downstream, as juveniles were observed downstream at the Middle Creek south location. They spawn above both locations.

The channel is broad and shallow with gravel bars extending into its center. These have grown more exposed with warming temperatures.

Strips of riparian vegetation lining each side of the channel are about 25 ft. wide to the west and 50 feet wide to the east. They are primarily grasses, herbaceous plants including mugwort, shrubs including Himalayan blackberries, and trees, primarily willow sp., poplar, and California bay laurel, that offer horizontal and vertical habitat for wildlife and instream shade. Instream niches develop from woody debris and gravel bars near banks. This specific location is fairly well protected, secluded, and accessed by a lightly used wildlife trail.

Grasses, wildflowers, and vetch are thick and tall on the broad levee bench to the east, before the second tier. In very late spring, bowers and paths in tall grasses are evidence of wildlife frequenting the area. Insects, bees, and lizards are prolific here.

Levees on the east and west sides are topped with easily traveled roadways. Especially to the east, people, dogs, joggers, trucks or similar vehicles, and dirt bikes are often present or they leave tracks.

Below are images of this location, typical of ecology that is observed each year.



3.6.2020, 1125



5.29.2020, 1012

Vegetation

Riparian vegetation lines creek banks at all locations, in greater or lesser quantity and variety, and surrounds the pool at Tulelake.

Trees include willows, *Salix sp.*, oak, *Quercus sp.*, cottonwood, *Populus sp.* primarily *fremonti*, white alder, *Alnus rhombifolia*, and California bay laurel, *Umbellularia californica*. Shrubs and shrubby growth at most locations consist of Himalayan blackberries, *Rubus armeniacus*, poison oak, *Toxicodendron diversilobum*, various ruderal grasses and wild grains, herbaceous growth indigenous and invasive, various sedges, Fam. Cyperaceae, and tules, *Schoenoplectus acutus*, as lower tiers along some creek banks and around the pool at Tulelake.

Instream algal mats and algae on substrate grew at all locations.

Surrounding environments are primarily meadows, hillsides, oak woodland, orchards, and residences.

Wildlife

Notes from field sheets recorded wildlife at each location (see above). Time spent at monitoring locations was not lengthy and observations were summarized.

Wildlife especially avian was always present and always influenced by weather patterns and intrusive sounds or activities. Temperatures were already warm when monitoring began this year, and wildlife was subdued in hot weather. A variety of insects, especially bees, butterflies, and other flying insects as well as insects on the ground were prolific in warmer weather. Macroinvertebrates were not observed this year but were likely present especially near creek banks. Crickets and toads were heard.

Very few days monitoring meant there was little time overall for observing wildlife or signs of it. Rather than note animals that were not noted, a reference list of wildlife normally observed to be present by sight, hearing, or evidence such as tracks or scat is compiled below. Wildlife identified with confidence by sight, vocalizations, tracks, and scat this year is already listed for each location in a Brief Summary of Fish Count, Wildlife, and Immediate Environment. Vocalizations were often too numerous to count. 'Passerine' included, among many others, white crowned sparrow, golden crowned sparrow, American goldfinch, and lesser goldfinch.

White crowned sparrow, *Zonotrichia leucophrys*
Golden crowned sparrow, *Zonotrichia atricapilla*
American goldfinch, *Carduelis tristis*
Lesser goldfinch, *Carduelis psaltria*
American bushtit, *Psaltiriparus minimus*
Black phoebe, *Sayornis nigricans*
American cliff swallow, *Petrochelidon pyrrhonota*
Red-winged blackbird, *Agelaius phoeniceus*
Brewer's blackbird, *Euphagus cyanocephalus*
Mourning dove, *Zenaida macroura*
California quail, *Callipepla californica*
Wild turkey, *Meleagris gallopavo*
Northern mockingbird, *Mimus polyglottos*
Acorn woodpecker, *Melanerpes formicivorus*
Nuttall's woodpecker, *Picoides nuttallii*
Downy woodpecker, *Picoides pubescens*
Hairy woodpecker, *Leuconotopicus villosus*
Scrub jay, *Aphelocoma coerulescens*
Stellar's jay, *Cyanocitta stelleri*
California towhee, *Meolzone crissalis*
American robin, *Turdus migratorius*
Bushtit, *Aegithalos caudatus*

American crow, *Corvus brachyrhynchos*
 Common raven, *Corvus corax*
 Turkey vulture, *Cathartes aura*
 American kestrel, *Falco sparverius*
 Red-shouldered hawk, *Buteo lineatus*
 Red-tailed hawk, *Buteo jamaicensis*
 Cooper's hawk, *Accipiter cooperii*
 Sharp-shinned hawk, *Accipiter striatus*
 Loggerhead shrike, *Lanius ludovicianus*
 Osprey, *Pandion haliaetus*
 Bald eagle, *Haliaeetus leucocephalus*
 Waterfowl and herons:
 American white pelican, *Pelecanus erythrorhynchos*
 Canada goose, *Branta canadensis*
 Common merganser, *Mergus merganser*
 Mallard, *Anas platyrhynchos*
 Ring-necked duck, *Aythya collaris*
 Greater and lesser scaups, *Aythya marila* and *Aythya affinis*
 Great white egret, *Casmerodius albus*
 Snowy egret, *Egretta thula*
 Pelagic cormorant, *Phalacrocorax pelagicus*
 Great blue heron, *Ardea herodias*
 Black crowned night heron, *Nycticorax nycticorax*
 Green-backed heron, *Butorides striatus*,
 Western grebe, *Aechmophorus occidentalis*
 Clark's grebe, *Aechmophorus clarkii*
 American coot, *Fulica americana*
 Flying and terrestrial insects and aquatic macroinvertebrates
 Tadpoles
 California toad, *Bufo boreas*.
 Ground squirrel, *Otospermophilus beecheyi*
 Grey squirrel, *Sciurus griseus ssp.*
 Raccoon, *Procyon lotor*
 Skunk, *Mephitis mephitis*
 Common raccoon, *Procyon lotor*
 American mink, *Neovison vison*
 Red fox, *Vulpes vulpes*
 White tailed deer, *Odocoileus virginianus*
 Coyote, *Canis latrans*
 Mountain lion, *Puma concolor*
 Black bear, *Ursus americanus*
 Gopher, Fam. Geomyidae, fresh mounds
 Mole, Fam. Talpidae, fresh mounds and runs
 Domestic dog, *Canis familiaris*
 Domestic cat, *Felis catus*
 Domestic horse, *Equus ferus caballus*
 Domestic rooster, *Gallus gallus domesticus*
 Feral swine, *Sus scrofa*

Image taken from research, Observations of Larval Development of Clear Lake Hitch,, S. Franson, 2012

Clear Lake hitch, *Lavinia exilicauda chi*



Image taken 5.13.2021 at the Middle Creek South location 5.13.2021, 1136

Sacramento sucker, *Catostomus occidentalis*



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Additional resources are at <http://www.rootlets.com/environment/listsources.html>.

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