

2018 California Waterfowl Breeding Population Survey¹

By

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Summary

The annual California Department of Fish and Wildlife (CDFW) waterfowl breeding population survey has been conducted since 1948. The survey was redesigned in 1991 to update methodology and has been conducted in its current form since 1992. The purpose of the survey is to estimate local waterfowl populations in major concentration areas of the state to inform management. Data from the survey were incorporated into the U.S. Fish and Wildlife Service Adaptive Harvest Management framework for Western mallards in 2008 and has since been an integral part of informing waterfowl harvest management in the Pacific Flyway.

In 2018, the survey was conducted from 24 – 28 April in the Central Valley and 9 –10 May in northeastern California. The total breeding population of ducks in the survey area increased 39% from 2017, and are near the long-term average. Mallards (*Anas platyrhynchos*) increased 38% from 2017 but are 19% below the long-term average. Gadwalls (*Merca strepera*) increased 43% from 2017 and are 20% above the long-term average. Cinnamon teal (*Spatula cyanoptera*) increased 131% from 2017 and are 83% above the long-term average. Canada geese (*Branta canadensis*) in northeastern California were similar to 2017 and remain 27% above the long-term average. February rains were well below normal across all survey strata, but late spring rains provided near-average precipitation in the northern Central Valley and northeastern California. Snow-water content was below average in the Sierra Nevada and Cascade ranges. However, reservoir levels remained high stemming from above-average rainfall and snowpack from 2017. Water allocations for wetland management are 100% for all Central Valley Project management areas and rice. In the Klamath Basin, refuges have not received water to maintain wetland levels since December 2017. At the time of the survey these areas had moderate flooding for breeding and molting waterfowl but shortages are forecasted to accommodate regional agriculture. Other areas in northeastern California have sufficient water resources for wetland management.

¹ Data are preliminary.

Methods

The procedures used in conducting this survey generally follow those set forth in the U.S. Fish and Wildlife Service (USFWS) protocol or standard operating procedures (SOP) for the Waterfowl Breeding Population and Habitat Conditions Survey (USFWS and CWS 1987). SOPs for the CDFW Waterfowl Breeding Population Survey (hereafter California survey) are as follows:

Survey Timing

In the Central Valley and the Suisun Marsh about half of the duck nests are initiated by the last week of April. A range of 48 to 54 days was documented between 10% and 90% of nest initiation in the Suisun Marsh during 5 years of study (McLandress et al. 1996). In northeastern California, nest initiations are later due to the increase in latitude, elevation and correspondingly cooler temperatures. About 50% of mallard nests in northeastern California are initiated by mid-May (Zezulak et al. 1991). Based upon these regional nesting chronologies, surveys in the Central Valley are conducted during the last week of April, and by mid-May, in northeastern California. The established survey dates likely miss early nesting mallards and pintails.

Survey Flight Time

Survey flights are scheduled to begin no later than two hours after sunrise in order to ensure adequate lighting and avoid detection problems. Surveys are completed no later than 1400 hours, which facilitates use of Sacramento Executive Airport as a daily stopping point (except in northeastern California). This also minimizes travel expenses and repeated non-survey flight hours.

Survey Sample

The California survey consists of nine strata (Fig. 1; see Zezulak et al. 1991). A stratum is a defined geographic unit encompassing areas of similar waterfowl densities and is generally of a single or unique complex of habitat type(s). Most strata are continuous spatial units except the Northeastern stratum, where mountainous terrain separates each wetland complex.

A transect is the sampling unit of the California survey, which can have multiple segments. A transect is generally a continuous series of segments, except in the Northeastern stratum where segments and transects can be disjunct. Segments are generally 18-statute miles (29 km), except in the Napa-Santa Rosa and Northeastern strata, where basin length is less than 18 mi due to terrain. Thus, survey segments in Napa-Santa Rosa and Northeastern California are designed to fit within the geographic features of the valleys. Transects in the Suisun Marsh and Northeastern California strata were selected to provide a representative sample of areas surveyed before the 1991 redesign.

Survey Flight Path

Transects within the Central Valley are oriented 45° from true north. Most waterways in the Central Valley are oriented north-south or east-west and the prescribed orientation is intended to minimize biases associated with transects that might run parallel or perpendicular to waterways. Latitude and longitude coordinates define each transect and all segment beginning and ending points.

Transect Placement

A randomly selected starting point for the transects within the Central Valley was established just south of Red Bluff and all subsequent segments through most of the San Joaquin Valley are located at parallel 14 mi (22.5 km) intervals. The San Joaquin Desert segments are spaced 28 mi (45 km) apart due to decreased waterfowl habitat, low waterfowl densities and time constraints. East and West Valley starting points were randomly selected and transects were placed between the border of the intensive agricultural areas of the Central Valley and the 500 ft (152 m) elevation line.

Fixed-wing Flight Procedure

The California survey utilizes one CDFW pilot and two CDFW observer-biologists. The pilot's responsibilities are navigation, including waypoint delineation of segment beginning and ending points. The pilot maintains an air speed of 90-110 mph (145-180 km/hr) and an altitude of 150 ft (45 m) above ground level. Each observer counts all ducks, geese, American coots (*Fulica americana*) and Sandhill cranes (*Grus canadensis*) within 660 ft (200 m) on each side of the aircraft, creating total sample width of 1/4 mi (400 m).

Visibility Bias Correction

The orientation of transects precludes ground coverage of most segments. Therefore, the California survey utilizes the double-sampling procedure (Koneff et al. 2008), employed by the SOPs. This method incorporates a "complete count" subsample of selected segments to correct for detection bias, known as a visibility correction factor (VCF). Helicopter comparison segments follow fixed-wing segments in all strata except the Napa/Santa Rosa stratum. Segments were selected based on the relative abundance of waterfowl, representative habitats, and proximity to airports. Two CDFW observer-biologists accompany a CDFW helicopter pilot as in the fixed-wing surveys. The helicopter is flown at 40-45 mph (65-70 km/hr) and an altitude of 100 ft (30 m) along segments. The two helicopter crew record waterfowl in the same manner as fixed-wing observers.

Data Collection

All waterfowl data are recorded per the SOPs, except as noted in Appendix 1. Observations are recorded directly to a computer using the Survey Record Program (Jack Hodges, USFWS 2014). Each computer is tethered to a GPS unit which allows the survey software to simultaneously record observations and coordinates into linked sound and ASCII files.

Data Analysis

The Survey Transcribe Program (Jack Hodges, USFWS 2014) is used on the ground to replay the linked sound files and combine the observation data with the geographic coordinates to produce a final ASCII data file for data analysis. A “total indicated birds” is calculated for each species on each survey segment using the criteria in Appendix 1 from both the fixed-wing and helicopter data. A mean density is calculated for each species, within each stratum, by averaging the density of total indicated birds for each transect. The stratum area for expansion is calculated by subtracting the transect area surveyed from the stratum area. An uncorrected estimate is calculated by multiplying the mean density by the adjusted stratum area.

The VCF is calculated for each waterfowl species based on the ratio of ducks seen by the helicopter crew, divided by the number of ducks seen by the fixed-wing crew on replicated segments. The current year VCF is compared to long-term VCF estimates at various pooling levels (e.g., 2 years, 5 years, 10 years, etc.), as well as the USFWS long-term average in the midcontinent. The current year’s VCF is used for mallards, so long as specific criteria are met (Appendix 2). The long-term average is used for seldom seen species. Once the uncorrected estimates and VCFs are generated, a population estimate is then calculated by multiplying the VCF by the uncorrected population estimate.

Results

The survey was flown from 24 – 28 April 2018, in the Central Valley and 9 – 10 May, 2018 in northeastern California. Transect-segment 2-3 in the Napa-Santa Rosa stratum was not flown due to dense fog. Transect-segment 7-20 in northeastern California was not flown due to high winds. The survey was 98% complete in the Central Valley and 95% complete in northeastern California, for a total survey effort of 97%.

Total breeding ducks in the survey area increased 39% from 2017 ($\bar{x} = 549,180 \pm SE = 59,114$) and are near the long-term average (Table 1). The most abundant species were mallards ($272,859 \pm 42,037$), followed by gadwall ($102,637 \pm 28,768$) and cinnamon teal ($78,498 \pm 26,143$). Mallards, gadwall and cinnamon teal comprised 83% of ducks observed. Mallards increased 38% from 2017 and are 19% below the long-term average. Gadwalls are 43% above 2017 and 20% above the long-term average. Cinnamon teal are 131% above 2017 and 83% above the long-term average.

Other, less numerous, waterfowl species present in the survey include: American green-winged teal (*Anas carolinensis*), northern shoveler (*Spatula clypeata*), northern pintail (*Anas acuta*), wood duck (*Aix sponsa*), redhead (*Aythya americana*), canvasback (*Aythya valisineria*), lesser scaup (*Aythya affinis*), ring-necked duck (*Aythya collaris*), bufflehead (*Bucephala albeola*), ruddy ducks (*Oxyra jamaicensis*) and common merganser (*Mergus merganser*). These species comprise 17% of total ducks, of which northern shovelers, wood ducks, redheads, and ruddy ducks were the most common (Table 1).

American coots were up 42% (396,561 \pm 100,605) from 2017, 61% above the long-term average (Table 1). Canada geese (*Branta canadensis*) are counted in all strata but only the Northeastern stratum is used to monitor the traditional breeding population of Canada geese that nest within California. The 2018 estimate of Canada geese in Northeastern was similar to 2017 (54,851 \pm 15,122), remaining 26% above the long-term average (Table 1). Sandhill cranes also nest in the Northeastern stratum and are down 25% (2,489 \pm 1422.0) from 2017, 6% above their 4-year average.

Precipitation was low across all strata during February 2018; however, some recovery occurred during March and April, particularly in northern survey strata (Table 2; NOAA 2018, Western Regional Climate Center 2018). Weather station data indicated that wetter than normal conditions were observed in the northern Sacramento Valley, while drier than normal conditions were observed in the southern San Joaquin Valley. Rainfall and snow-water content in the Northeastern stratum were below average across the survey area, although reservoir levels remained high stemming from above average rainfall and snowpack during 2017 (Table 2, Table 3; NOAA 2018, Natural Resource Conservation Service 2018, Western Regional Climate Center 2018).

Discussion

Waterfowl populations appear to be in a state of recovery after poor production during the multi-year drought experienced in California from 2013 – 2016. Notable increases in mallards were seen in the Sacramento Valley (+83%) and the San Joaquin Grasslands (+73%), but populations in each of these regions remain below long-term averages (i.e., -50% and -28%). Increasing orchard development and decreasing complementary agriculture (e.g. winter wheat, alfalfa, and hay) in the Sacramento Valley and San Joaquin Grasslands will likely limit future waterfowl population growth in these regions (USDA National Agriculture Statistics Service 2018).

Northeastern California and Napa-Santa Rosa are the only strata with mallard population estimates above the long-term average (+19% and +27%). These strata accounted for 41% and 6% of mallards observed during 2018. In Northeastern California, refuges, natural habitat and complimentary agriculture dominate the landscape creating a large area of upland nesting habitat amongst a variety of wetland types (e.g., natural wetlands, managed wetlands, cattle ponds, reservoirs). In Napa-Santa Rosa, wetland restoration in north San Pablo Bay has likely increased waterfowl production in the area.

Water allocations in the Central Valley are forecasted to be at full allotment for wetland management and rice planting, which should be beneficial to breeding waterfowl in the region. In the Klamath Basin, refuges have not received water to maintain wetland levels since December 2017. At the time of the survey these areas had moderate flooding for breeding and molting waterfowl but shortages are forecasted to accommodate regional agriculture. Other areas in northeastern California have sufficient water resources for wetland management.

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Figure 1. California Breeding Waterfowl Population Survey map.

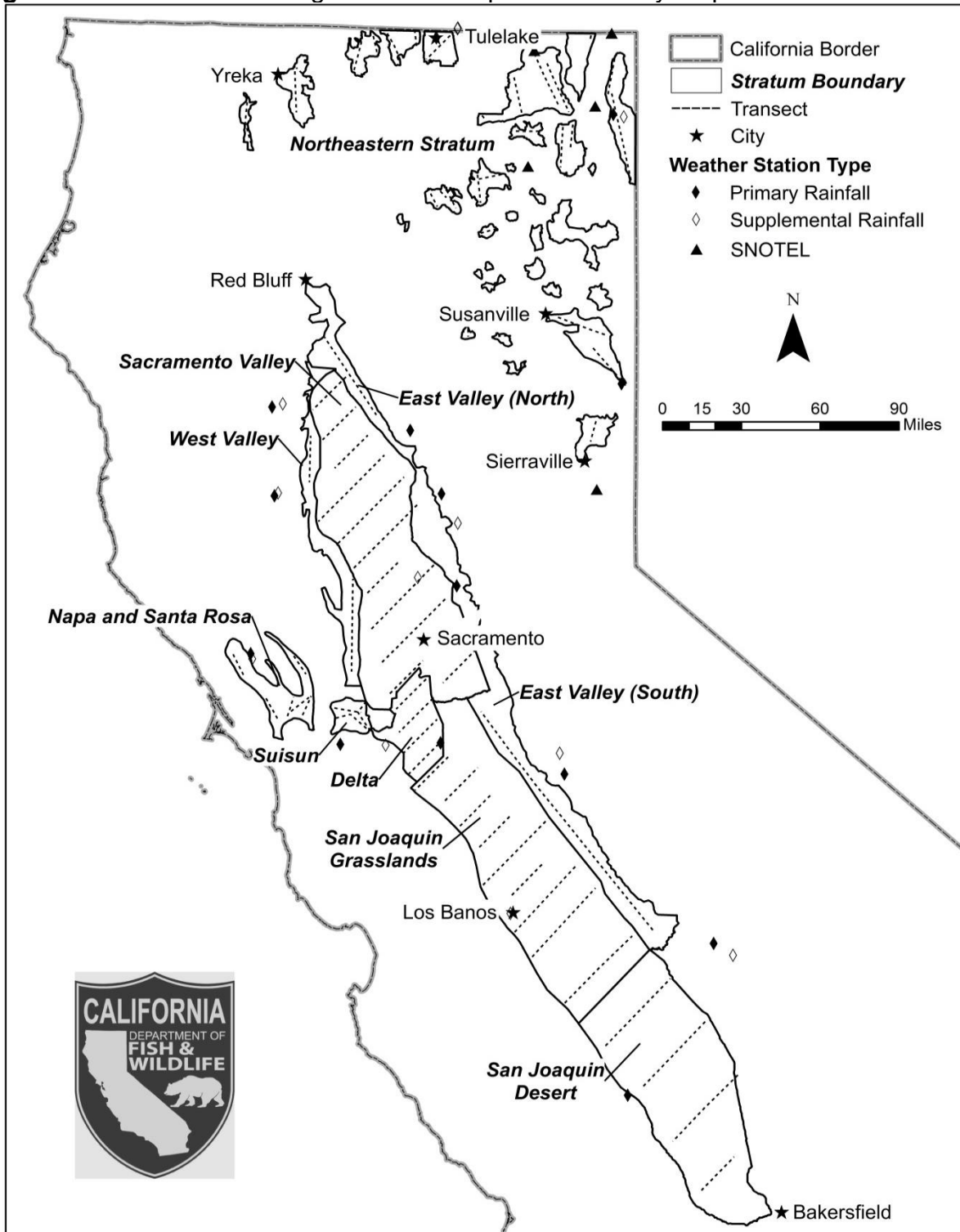


Table 1. California Breeding Waterfowl Population Survey estimates and standard errors.

	2018	SE	2017	SE	LTA¹	% Change From	
						2017	LTA
Mallard	272,859	42,037	198,392	31,863	337,256	37.5%	-19.1%
Gadwall	102,637	28,768	71,765	18,666	85,573	43.0%	19.9%
American Wigeon	2,309	1,132	2,866	1,864	4,620	-19.4%	-50.0%
Green-winged Teal	3,358	1,241	1,845	869	3,849	82.0%	-12.8%
Cinnamon Teal	78,498	26,143	33,975	12,156	42,843	131.0%	83.2%
Northern Shoveler	24,330	5,655	14,964	6,231	31,828	62.6%	-23.6%
Northern Pintail	8,478	3,232	23,162	10,065	7,114	-63.4%	19.2%
Wood Duck	15,391	4,969	2,007	927	8,297	666.9%	85.5%
Redhead	13,263	7,789	12,616	5,075	3,918	5.1%	238.5%
Canvasback	1,292	855	1,135	636	1,106	13.9%	16.9%
Lesser Scaup	1,001	791	5,506	2,256	4,884	-81.8%	-79.5%
Ring-necked Duck	3,134	1,597	4,933	1,517	837	-36.5%	274.3%
Goldeneye	0	0	0	0	285		
Bufflehead	9,168	5,405	3,709	1,429	3,323	147.2%	175.9%
Ruddy Duck	13,102	7,241	18,081	11,634	15,333	-27.5%	-14.5%
Common Merganser	359	338	1,574	1,435	500	-77.2%	-28.3%
TOTAL DUCKS	549,180	59,114	396,530	42,775	551,567	38.5%	-0.4%
Canada Geese ²	54,851	15,122	55,224	20,731	43,614	-0.7%	25.8%
American Coot	396,561	100,605	278,588	110,176	246,165	42.3%	61.1%
Sandhill Crane ³	2,489	1,422	3,312	1,603	2,351	-24.8%	5.9%

¹Long-term average; 1992 – 2018 for ducks and coots.

²Northeastern stratum estimates only, LTA = 1993 – 2018.

³Northeastern stratum estimates only, LTA = 4-year average.

Table 2. Precipitation (inches)¹ across California Breeding Waterfowl Population Survey strata.

Strata²	Year	Jan	Feb	Mar	Apr	May⁴	Spring Total	Z-Score
Sacramento Valley	2018	29.10	3.57	33.32	19.64	---	85.63	0.48
(Strata 1)	LTA	30.03	28.69	21.72	12.56		93.00	
Sac/San Joaquin Delta	2018	8.23	1.57	7.55	3.72	---	21.07	-0.71
(Strata 2)	LTA	9.97	9.35	6.90	3.73		29.94	
San Joaquin Desert	2018	3.12	0.62	7.81	0.93	---	12.48	-0.55
(Strata 3)	LTA	5.27	4.36	5.12	2.53		17.28	
San Joaquin Grasslands	2018	10.20	2.13	17.83	5.88	---	36.04	-0.45
(Strata 4)	LTA	15.07	13.43	14.38	8.18		51.06	
Suisun	2018	3.03	0.64	5.23	2.32	---	11.22	-0.05
(Strata 5)	LTA	3.99	3.75	2.53	1.32		11.44	
Napa/Santa Rosa	2018	5.57	0.54	6.34	3.45	---	15.90	-0.08
(Strata 6)	LTA	5.09	5.18	4.72	1.68		16.67	
East Valley (North) ³	2018	18.04	2.76	23.94	11.95	---	56.69	0.11
(Strata 10)	LTA	16.79	16.52	12.62	8.00		53.95	
East Valley (South)	2018	4.92	0.99	13.66	3.53	---	23.10	0.15
(Strata 10)	LTA	6.63	5.50	5.52	3.51		21.16	
West Valley	2018	11.43	0.75	10.58	9.14	---	31.90	-0.63
(Strata 11)	LTA	14.42	13.69	11.46	4.79		44.36	
Northeastern CA	2018	3.93	1.18	6.40	6.60	10.37	28.48	-0.33
(Strata 9)	LTA	8.70	6.35	7.13	6.41	8.97	37.90	

¹Data acquired from NOAA NCDC online database or RAWS station online data, long term averages derived from 1990-2018.²For stratum with large area a sum of precipitation was calculated using numerous weather stations, see appendix III for detail.³East Valley was separated at Sacramento due to differences in weather to be more informative however BPS data analyzes this stratum as one.⁴May precip data not included in Central Valley areas because the survey is conducted in April.

Table 3. Snow-water content (inches)¹ across Northeastern California survey stratum.

Location	Year	Nov	Dec	Jan	Feb	Mar	Apr	Season Average	Z- Score
Adin Mountain ²	2018	0.0	0.0	1.2	2.8	4.1	5.8	2.3	-1.22
	LTA ²	0.9	3.6	6.6	9.3	11.2	7.8	6.6	
Cedar Pass ³	2018	0.0	1.4	2.7	5.8	8.5	11.2	4.9	-1.12
	LTA	1.5	4.9	8.6	12.1	15.4	14.3	9.5	
Dismal Swamp ⁴	2018	0.0	5.0	7.0	12.9	14.5	22.6	10.3	-0.93
	LTA	1.9	7.4	13.7	19.3	24.9	26.4	15.6	
Independence Lake ⁵	2018	0.0	9.8	11.0	16.5	19.1	35.9	15.4	-0.87
	LTA	2.7	10.1	18.9	28.0	37.5	43.0	23.4	

¹Data from NRCS snow telemetry stations, see appendix xx for more details.

²LTA 1990-2018.

Appendix I. Guidelines for California Breeding Waterfowl Survey data

Definitions

Total Indicated Birds:	Drakes, Pairs and Groups combined.
Lone Drake:	Single isolated drake without a visible associated hen.
Flocked Drakes:	Four or fewer drakes in close association.
Pair:	Male and female in close association.
Group:	Five or more of mixed-sex grouping of the same species in close association which cannot be separated into singles and pairs.

Total Indicated Birds = Lone drakes x 1, Pairs x 2, Groups x 1 (AOU_Num)

- Redhead (1460): exclude groups greater than 8
- Ring-necked Duck (1500)
- Lesser Scaup (1490): do not count in Napa and Suisun Strata
- Ruddy Duck (1670)
- Canada Goose (1720): count all broods separately
- Greater white-fronted goose (1710)
- American Coot (2210)
- Sandhill Crane (2060)
- Mute Swan (1782)

Total Indicated Birds = Lone drakes x 2, Pairs x 2, Flocked Drakes x 1, Groups x 1

- Common Merganser (1290)
- Mallard (1320)
- Gadwall (1350)
- American Wigeon (1370): exclude groups
- American Green-winged Teal (1390): exclude groups greater than 8
- Cinnamon Teal (1410)
- Northern Shoveler (1420): exclude groups
- Northern Pintail (1430)
- Wood Duck (1440)
- Canvasback (1470): exclude groups
- Common Goldeneye (1510)
- Bufflehead (1530)
- Blue-winged Teal (1400)

Appendix II. Guidelines for Determining Annual Visibility Correction Factor (VCF)

California VCFs are to be used for most species. The preference is for the current year VCF to reflect habitat or general conditions, especially for mallards. Sample size and Coefficient of Variation (CV) rule: at least 40 observations for the helicopter and fixed wing crews with a CV of 20% or less. If VCF is 1.0 or less do not use. If current year does not meet criteria, use previous year until criteria are met. Pooling can be used if criteria cannot be met and single year estimate is deemed not reasonable (VCF of 1.5 or less for mallards). In the case of scaup, ring-neck duck, mergansers, and goldeneye (species with few detections/low abundance in California) use U.S. Fish and Wildlife Service VCF.

Appendix III. Weather station metadata.

Station Name	Station ID	Stratum	Type	Latitude	Longitude	Website	Notes
Juniper Creek RAWS	NWS 040308	Northeastern	Rainfall	41.33222	-120.4725	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCJUN	Main station
Ash Creek RAWS	NWS 040244	Northeastern	Rainfall	41.27694	-121.9794	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCASC	Main station
Tule Lake GHCND	GHCND:USC00049053	Northeastern	Rainfall	41.96667	-121.46667	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Main station
Doyle RAWS	NWS 040724	Northeastern	Rainfall	40.02222	-120.1056	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCDOY	Main station
Cedarville GHCND	GHCND:USC00041535	Northeastern	Rainfall	41.53333	-120.16667	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate station for Surprise Valley RAWS
Surprise Valley RAWS	NWS 043690	Northeastern	Rainfall	41.62028	-120.156667	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCSP3	Main Station
Paskenta Ranger Station	GHCND:USC00046726	West Valley and Sacramento Valley	Rainfall	39.88333	-122.53333	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate station for Thomes Creek RAWS
Thomes Creek RAWS	NWS 40816	West Valley and Sacramento Valley	Rainfall	39.86444	-122.6097	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCTHO	Main Station
Stoney Gorge	GHCND:USC00048587	West Valley and Sacramento Valley	Rainfall	39.38333	-122.55	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate station for Stonyford RAWS
Stonyford RAWS	NWS 041503	West Valley and Sacramento Valley	Rainfall	39.36694	-122.575	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCSTO	Main Station
Bangor RAWS	NWS 041201	East Valley(North) and Sacramento Valley	Rainfall	39.3975	-121.3861	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCBGR	Main Station
Cohasset RAWS	NWS 41211	East Valley(North) and Sacramento Valley	Rainfall	39.87167	-121.7689	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCCOH	Main Station
Lincoln RAWS	NWS 041907	East Valley(North) and Sacramento Valley	Rainfall	38.8825	-121.2683	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCLIN	Main Station
Santa Rosa RAWS	NWS 042009	West Valley and Napa/Santa Rosa	Rainfall	38.47861	-122.7119	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCSRS	Main Station
Santa Rosa GHCND	GHCND:USC00047965	West Valley and Napa/Santa Rosa	Rainfall	38.45	-122.7	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate for Santa Rosa RAWS
Martinez GHCND	GHCND:USC00045378	Suisun	Rainfall	38.0131	-122.1142	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Main Station
Los Banos RAWS	NWS 44003	San Joaquin Grasslands	Rainfall	37.05472	-121.0531	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCLAB	Main Station
Los Banos GHCND	GHCND:USC00045118	San Joaquin Grasslands	Rainfall	37.05	-120.86667	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate Station for Los Banos RAWS
Stockton Airport	GHCND:USW00023237	San Joaquin Grasslands and Delta	Rainfall	37.8891	-121.2258	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Main Station
New Melones Dam	GHCND:USC00046172	East Valley (South) and San Joaquin Grasslands	Rainfall	37.95	-120.53333	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate Station for Green Springs RAWS
Green Springs RAWS	NWS 43613	East Valley (South) and San Joaquin Grasslands	Rainfall	37.83306	-120.5	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCGSP	Main Station
Pine Flat Dam	GHCND:USC00046896	East Valley (South) and San Joaquin Desert	Rainfall	36.81667	-119.33333	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Surrogate Station for Fancher Creek RAWS
Fancher Creek RAWS	NWS 044516	East Valley (South) and San Joaquin Desert	Rainfall	36.88389	-119.4658	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCFAN	Main Station
Kettleman Hills RAWS	NWS 044602	San Joaquin Desert	Rainfall	36.03333	-120.0569	https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCKET	Main Station
Sacramento Executive Airport	GHCND:USW00023232	Sacramento Valley and Delta	Rainfall	38.5069	-121.495	https://gis.ncdc.noaa.gov/maps/ncei/cdo/daily	Main Station
Dismal Swamp	SNOTEL: 446	Northeastern	Snow	41.99	-120.18	https://wcc.sc.egov.usda.gov/nwcc/rgrpt?report=daily_snowdelta_7day&state=ca	Main Station
Independence Lake	SNOTEL: 541	Northeastern	Snow	39.43	-120.28	https://wcc.sc.egov.usda.gov/nwcc/rgrpt?report=daily_snowdelta_7day&state=ca	Main Station
Adin Mountain	SNOTEL: 301	Northeastern	Snow	41.24	-120.79	https://wcc.sc.egov.usda.gov/nwcc/rgrpt?report=daily_snowdelta_7day&state=ca	Main Station
Cedar Pass	SNOTEL: 391	Northeastern	Snow	41.58	-120.3	https://wcc.sc.egov.usda.gov/nwcc/rgrpt?report=daily_snowdelta_7day&state=ca	Main Station
Crowder Flat	SNOTEL: 977	Northeastern	Snow	41.89	-120.75	https://wcc.sc.egov.usda.gov/nwcc/rgrpt?report=daily_snowdelta_7day&state=ca	Main Station