

APPENDIX O

ASSESSMENT OF GDEs

APPENDIX O – IDENTIFICATION OF LIKELY GROUNDWATER DEPENDENT ECOSYSTEMS

This section provides a description of the approach used to refine potential groundwater dependent ecosystems (GDEs) in the North American Subbasin based on groundwater depth to water. Using this approach potential groundwater dependent ecosystems were classified as “Likely” (Kept) while others were classified as “Unlikely” (Removed) and removed for further consideration.

Verification of Connection to Groundwater

The Natural Communities Commonly Associated with Groundwater dataset (NCCAG, 2018) was used to provide the locations of potential GDEs.

Groundwater contours were developed using 61 wells and groundwater level measurements from Spring 2020. Spring 2020 was selected as having the most complete set of measurements, that include measurements from four new shallow monitoring wells (RDMW-101 through RDMW-104) constructed along the Bear and Feather Rivers early 2020 along with additional monitoring wells from various sources. Monitoring wells selected for contouring had screen intervals between 20 and 300 feet bgs, with only one exception, to represent the water table surface that could be accessed by vegetation. Deeper wells were incorporated into the contouring in the Central area where a large pumping depression has lowered the groundwater surface to over 150 feet below ground surface (bgs). Table O-1 provides the list of wells and their total depths and screen intervals. Figure O-1 shows the location of the wells and the groundwater elevation contours.

Invert elevations within rivers and canals were obtained from Central Valley Floodplain Evaluation and Delineation Program. Feather River, Bear River, Yankee Slough and Natomas Cross Canal were based on minimum values from selected cross section surveys. Sacramento River and American River values were derived from Urban Levee Evaluation Program multibeam SONAR surveys at approximately 1mile intervals within survey extents.

Ground surface elevations from National Elevation Dataset (NED) 1/3 arc-second (approximately 10 meter) elevation grids were obtained from United States Geological Survey via the National Map.

Water surface elevations were then subtracted from ground surface elevations to obtain the depth to water throughout the subbasin. Figure O-2 shows the depth to groundwater contours along with potential GDEs.

Likely GDEs

Potential GDEs have rooting depths that vary from a few feet up to 30 feet below ground surface (bgs) depending upon the type of vegetation. Likely GDEs were identified as those NCCAG areas that occur with a depth to groundwater of less than 30 feet bgs. Figure O-3 shows the area where likely GDEs will occur based on this analysis.

Unlikely GDEs

Further evaluation of some of the potential GDE areas with depths to groundwater greater than 30 feet was performed to assess why the potential GDEs were present and their source of water. Most of the potential GDEs were present along creeks in these areas. Sources of surface water to portions of Dry, Racoon, and Pleasant Grove Creeks and Auburn Ravines are from wastewater treatment plants both in the Subbasin and in watershed. Water in the creeks is also present due to releases from Nevada Irrigation District (NID) and Placer County Water Agency (PCWA) canals to Doty Ravine, Racoon Creek, Antelope Creek and Miners Ravine. The amount of surface water in these waterways can be influenced by return flows from customer purchases, leakage, and end of canal losses, but cannot be quantified. Another waterway that benefits from return flows is Markham Ravine but NID does not currently use it for conveyance. Historically, NID had supplied South Sutter Water District (SSWD) through Auburn Ravine but SSWD has not purchased water for a number of years. Currently, PCWA supplies surface water to customers in the Subbasin along Auburn Ravine. SSWD also uses the creeks and ravines within its boundaries for conveyance and to receive return water. Water in these creeks and ravines from these sources are not mandated, except for Dry Creek where 10,000 AFY is required to be released from Roseville's Dry Creek treatment plant, and may vary from year to year and may be reduced in the future due to recycling of treated water for use for irrigation and other uses.

Some of the potential GDEs along Markham Ravine in the area where the depth to groundwater is greater than 30 feet bgs, may also be supported by perched groundwater which cannot be managed and is not part of the principal aquifer. Perched water was encountered during construction of monitoring well number 91, Figure O-3.

Even within the area designated as being less than 30 feet depth to groundwater, perched groundwater conditions occur. Studies along the foothills, northeast of Lincoln and east of Highway 65, along Racoon Creek and Doty Ravine have shown groundwater is perching in thin alluvium resting on the low permeability sediments of the Ione Formation.

Potential GDEs along these creeks and in areas with depths to groundwater greater than 30 feet were removed as GDEs.

Data Gaps

There are some potential GDE areas within Placer, Sacramento and Sutter counties that based on the groundwater contouring that are not associated with surface water that warrant further evaluation.

There are some potential GDE areas within Placer, Sacramento and Sutter counties that based on the groundwater contouring appear to be supported by groundwater (i.e. less than 30 feet depth to groundwater) but need further review to confirm that these are not man-made features supported by irrigation, such as golf courses.

Table O-1. Groundwater Contouring Monitoring Well Construction Details

CASGEM SITE_CODE	LATITUDE	LONGITUDE	CommonName	MSMT_DATE	WSE	WLM_ORG_NAME	Screened Interval (ft bgs)	Total Depth (ft bgs)
388893N1212847W001	38.889283	-121.28468	MW 4	4/15/2020 7:57	162.28	Sacramento Groundwater Authority	15-25	25
389774N1213728W001	38.977408	-121.372844	MW-3	4/15/2020 8:56	76.69	Placer County	19.5-34.5	35
387515N1212725W001	38.751494	-121.272511	WPMW-10A	4/15/2020 12:05	137.21	City of Roseville	26-36	36
387517N1212727W001	38.751667	-121.272656	WPMW-9A	4/15/2020 12:05	140.66	City of Roseville	26-36	36
389785N1213713W001	38.97846	-121.37132	MW-1	4/15/2020 8:36	77.47	Placer County	30-40	40
389764N1213710W001	38.976427	-121.371001	MW-2	4/15/2020 8:42	77.17	Placer County	24.3-44.3	45
	38.639539	-121.561543	URS71000-700+00F	3/19/2020 9:30	6.53	Sacramento Groundwater Authority	Unknown	45
	38.639704	-121.562435	URS71000-700+00C	3/19/2020 9:15	7.47	Sacramento Groundwater Authority	Unknown	45
	38.774911	-121.597535	SREL-1-27-F1	3/19/2020 8:00	14.06	Sacramento Groundwater Authority	Unknown	46
389950N1214148W002	38.994987	-121.414793	RDMW-103	3/19/2020 12:00	68.09	Placer County	28-43	48
389919N1214141W002	38.991944	-121.414066	RDMW-104	3/19/2020 12:00	67.2	Placer County	28-43	48
386160N1215054W001	38.61603	-121.5054	Bannon Creek Park	4/8/2020 9:54	1.66	Sacramento Groundwater Authority	33-48	48
389857N1214880W004	38.9857	-121.488	BR-1A	3/11/2020 11:05	47.25	Yuba County Water Agency	28-48	48
	38.882937	-121.611051	RDMW-101	3/19/2020	19.65	Sutter County	28-43	48
	38.879869	-121.588533	RDMW-102	3/19/2020	19.43	Sutter County	28-43	48
387510N1212390W001	38.750989	-121.23895	WPMW-8A	4/15/2020 12:52	203.57	City of Roseville	30-50	50
386292N1214877W001	38.62921	-121.4877	Chuckwagon Park	4/8/2020 10:11	-7.19	Sacramento Groundwater Authority	27-37	52
388476N1212872W001	38.847609	-121.28719	WPMW-3A	4/15/2020 10:13	147.57	City of Roseville	48-53	53
388826N1213078W002	38.882583	-121.30775	MW 5-2	4/15/2020 8:19	110.51	City of Lincoln	52-62	62
385841N1214185W001	38.58414	-121.41852	SGA_MW04	4/8/2020 9:11	2.59	Sacramento Groundwater Authority	55-65	65
385841N1214185W001	38.58414	-121.41852	SGA_MW04	4/8/2020 9:11	2.59	Sacramento Groundwater Authority	55-65	65
385828N1213385W001	38.58281	-121.33846	SGA_MW06	4/8/2020 8:36	12.59	Sacramento Groundwater Authority	62-72	72
388971N1213301W002	38.897133	-121.330083	MW 3-2	4/15/2020 7:46	77.25	City of Lincoln	65-75	75
389669N1214897W001	38.9669	-121.4897	13N04E23A002M	3/2/2020 0:00	45.28	Department of Water Resources	Unknown	83
389255N1213566W003	38.925467	-121.356633	MW 2-3	4/15/2020 7:19	95.19	City of Lincoln	75-85	85
388604N1213544W004	38.860383	-121.354383	MW 1-4	4/15/2020 10:00	58.17	City of Lincoln	82-92	92
389185N1213268W001	38.918461	-121.326842	Swainson	4/15/2020 9:58	112.59	Placer County	44.1-91.9	92
389867N1213654W002	38.9867	-121.365	Spencer	4/15/2020 9:36	84.66	Placer County	96-107	107
387218N1214677W001	38.72178	-121.46771	SGA_MW01	4/8/2020 10:52	-15.66	Sacramento Groundwater Authority	100-110	110
386836N1214536W001	38.68362	-121.45363	SGA_MW02	4/8/2020 10:40	-13.36	Sacramento Groundwater Authority	100-110	110
389740N1213606W001	38.974027	-121.360615	Cemetery	4/15/2020 9:17	78.66	Placer County	70-111	111
387786N1213737W001	38.778603	-121.373698	WPMW-1A	4/15/2020 9:27	-0.07	City of Roseville	110-120	120
388260N1215394W004	38.826	-121.5394	SUT-P1	3/10/2020 10:49	19.23	Sutter County	110-120	120
387626N1213651W001	38.762629	-121.365099	SVMW East-2A	4/15/2020 9:44	2.02	City of Roseville	125-135	140
387000N1212180W001	38.69998	-121.21795	SGA_MW08	4/8/2020 14:17	107.21	Sacramento Groundwater Authority	130-140	140
387623N1213915W001	38.762324	-121.39153	SVMW West - 1A	4/15/2020 8:36	-12.35	City of Roseville	120-140	145
388235N1216079W001	38.823235	-121.60763	Sutter County MW-5A	4/23/2020 8:20	17.15	Department of Water Resources	130-160	160
386874N1212206W001	38.68739	-121.22058	SGA_MW09	4/8/2020 14:26	109.92	Sacramento Groundwater Authority	150-160	160
388882N1214005W002	38.888164	-121.400463	WPMW-11A	4/15/2020 7:31	22.47	Placer County	132-152	162
387216N1213842W001	38.72163	-121.38417	Lone Oak Park	4/8/2020 11:12	-10.53	Sacramento Groundwater Authority	151-161	166
386280N1213493W001	38.628	-121.349	WCM55	4/8/2020 8:15	-15.26	Sacramento Groundwater Authority	130-150	170
388116N1213054W001	38.811594	-121.305387	Tinker MW	4/15/2020 9:40	61.14	City of Roseville	117-177	177
389116N1215238W003	38.9116	-121.5238	AB-1 shallow	3/11/2020 11:45	34.32	Department of Water Resources	170-180	190
386964N1213120W001	38.6964	-121.31203	Twin Creeks Park	4/8/2020 13:37	-6.4	Sacramento Groundwater Authority	183-193	193
386547N1215320W001	38.6547	-121.532	386547N1215320W001	3/2/2020 0:00	4.21	Department of Water Resources	140-200	200
389791N1213727W001	38.979133	-121.372694	Old Well #2	4/15/2020 8:24	78.3	Placer County	144-209	209
386635N1213486W001	38.66347	-121.34859	SGA_MW05	4/8/2020 12:01	-13.68	Sacramento Groundwater Authority	205-215	215
388145N1213491W001	38.814497	-121.349144	WPMW-2A	4/15/2020 10:15	29.25	City of Roseville	215-225	225
387222N1212920W001	38.7222	-121.292	Whyte A	4/8/2020 13:21	10.21	Sacramento Groundwater Authority	200-220	226
386016N1213761W001	38.6016	-121.3761	DWR_SGA_004	3/5/2020 0:00	-19.10	Department of Water Resources	Unknown	238
388406N1215627W001	38.840601	-121.562699	S&O #17	4/25/2020 0:00	18.17	Sutter County	152-240	240
386038N1214357W001	38.6038	-121.4357	DWR_SGA_005	3/5/2020 0:00	-21.86	Department of Water Resources	Unknown	250
387511N1213389W001	38.7511	-121.3389		3/4/2020 0:00	5.02	Department of Water Resources	150-256	256
386310N1213864W001	38.63101	-121.38641	Well 10	4/28/2020 9:00	-25.91	Sacramento Groundwater Authority	210-262	265
386038N1213882W002	38.6038	-121.38815	MW11B	4/3/2020 12:30	-20.09	Sacramento Groundwater Authority	258-268	278
387957N1213813W001	38.795655	-121.38126	CVMW-1A	4/15/2020 9:14	1.61	City of Roseville	260-280	285
385947N1213985W001	38.59472	-121.39847	WPMW12A	4/3/2020 9:20	-16.3	Sacramento Groundwater Authority	260-280	300
388029N1214145W001	38.8029	-121.4145		3/4/2020 0:00	-10.04	Department of Water Resources	135-460	460
389292N1214056W001	38.9292	-121.4056		3/2/2020 0:00	50.50	Department of Water Resources	NA	NA
388667N1214513W001	38.8667	-121.4513	12N05E29D001M	3/4/2020 0:00	8.52	Department of Water Resources	NA	NA
387859N1216565W001	38.7859	-121.6565	RD 1500 Karnak	3/10/2020 0:00	17.03	Department of Water Resources	Unknown	Unknown



