TECHNICAL MEMORANDUM

Date:	January 8, 2021
To:	Ad Hoc Sustainable Groundwater Planning Advisory Committee (GSU22 Committee)
cc:	Brian Lockwood, PG, CHG and Casey Meusel, Pajaro Valley Water Management Agency
From:	Greg Kamman, PG, CHG
Reviewed by:	Cameron Tana, PE, Montgomery & Associates
Project:	20-1030/M&A 9090.0501
Subject:	Identification of Groundwater Dependent Ecosystems (GDE) Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22)

1.0 Background

The Pajaro Valley Water Management Agency (PV Water) submitted a Groundwater Sustainability Plan (GSP) Alternative for the Pajaro Valley Subbasin (Basin) on December 31, 2016 per the Sustainable Groundwater Management Act (SGMA). The California Department of Water Resources (DWR) assessed the Alternative and approved PV Water's GSP-Alternative. DWR's assessment listed recommendations for PV Water to address in its first five-year update of the Alternative, including Recommended Action 3: "Staff recommend that the Agency provide an identification of groundwater dependent ecosystems in the Subbasin." This memo addresses this recommended action as part of the Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22) to be submitted to DWR as the first five-year update of the Alternative.

2.0 Identification of Groundwater Dependent Ecosystems

Section 351 (m) of the GSP Regulations define groundwater dependent ecosystems (GDE) as, "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface." Because GDEs are considered a beneficial user of groundwater, GSPs are required to identify GDEs within the basin using data available from the Department of Water Resources (DWR) or the best available information (per Section 354.16 [g] of GSP Regulations). The Sustainable Groundwater Management Act (SGMA) does not require that sustainable management criteria be established specifically for GDEs. However, GDEs should be considered as a beneficial user of groundwater when developing sustainable management criteria in a GSP. The following sections present the methods and findings for identifying potential GDEs in the Pajaro Valley Groundwater Basin (Basin).

2.1 Methodology for GDE Identification

The Natural Communities Commonly Associated with Groundwater (NCCAG) database developed collaboratively by DWR, California Department of Fish and Wildlife (CDFW) and The Nature Conservancy (TNC) delineates potential GDEs within the Basin (Klausmeyer et al., 2018; DWR, 2018). The NCCAG database was developed through review and screening of mapped California vegetation, wetlands, springs and seeps commonly associated with groundwater. The NCCAG defines and maps both wetland and vegetation habitat classes. The wetland class includes features commonly associated with surface expression of groundwater under natural, unmodified[1] conditions. The vegetation class includes vegetation commonly associated with the presence of shallow groundwater (e.g., phreatophytes). Figure 1 shows the location of mapped NCCAG wetlands and vegetation classes in the Basin.

GDE wetlands and vegetation provide freshwater habitat for fish and wildlife species. Table 1 includes a list (scientific and common name) of all known freshwater species that have been observed or have the potential to exist within the Basin as identified by TNC (2019). Table 1 includes the conservation status for each applicable species, indicating whether federal and/or state endangered species laws may apply to management of the species. Species designated as state and federally listed, threatened and of special concern are indicated by bold text in Table 1.

To further delineate potential GDEs in the Basin, cbec completed an analysis to identify wetland and vegetation communities in areas where groundwater levels are shallower than 30 feet below ground surface (bgs), a conservative estimate of potential maximum vegetation rooting depths (TNC, 2018). NCCAG wetland and vegetation classes in areas with groundwater shallower than 30 feet bgs were considered as potential GDEs, while NCCAG classes in areas with groundwater depths greater than 30 feet were not.

Understanding that seasonal and long-term fluctuations in groundwater table elevations will affect the spatial extent of areas within 30 feet of the water table, cbec prepared spring and fall period depth-to-water (dtw) maps for dry (2015), wet (2019) and very wet (2017) year-types (see Figures 2a and 2b). The areas shaded in color on Figures 2a and 2b indicate where dtw is less than 30 feet below ground surface (bgs), while unshaded areas indicate where dtw is greater than 30 feet bgs. These depth-to-water maps were prepared by GIS comparison of paired seasonal groundwater elevation surfaces to ground surface elevations. The seasonal groundwater elevation surfaces were derived from groundwater elevation contour maps prepared by the Pajaro Valley Water Management Agency (PV Water)[2]. These maps

[1] Some wetlands are artificially flooded by modifications to the hydrology of the systems and thus may be reliant on their alterations rather than on groundwater. Examples of these modifications include dams, pumps, levees, weirs, and irrigation systems. Human modified wetlands are excluded in the database (Klausmeyer et al., 2018).

[2] PV Water's groundwater elevation contour maps generally represent the potentiometric surface of the Aromas Red Sands Aquifer, which is mostly under confined to semi-confined conditions in the Basin. A potentiometric surface represents the level to which water will rise in a well screened in a confined aquifer. The water table is a potentiometric surface for an unconfined aquifer. If separated by a confining unit, the elevations of these surfaces may be different due to head (pressure) differentials between aquifers. Technically, the depth to elevations on the PV Water groundwater contour maps is referred to as "depth to potentiometric surface", as indicated on Figures 2a and 2b. However, for simplicity, this depth is referred to as "depth to water" in the text.

illustrate the seasonal high and seasonal low conditions observed in wells constructed in the Aromas Red Sands Aquifer. Extractions from the Aromas Red Sands Aquifer constitute ~65% to 70% of groundwater production, making it the principal aquifer in the Basin (Hanson et al, 2014).

Comparison of Figures 2a and 2b indicate that groundwater levels are higher and soil saturation is greater during the winter wetland growing season. The presence of saturated conditions in a wetland is a determining factor in plant establishment, growth and composition (Mitsch and Gosselink, 1993). Because the establishment, recruitment and sustainability of wetland and riparian vegetation is controlled more by springtime (wet) groundwater conditions than the fall (dry) period, cbec completed GDE mapping using the spring period dtw maps.

A digital elevation model (DEM) of ground surface topography was derived from a 2018 QL2 LiDAR data collection effort led by the United States Geological Survey (USGS). The resulting maps depicting the depth to groundwater within 30 feet of the ground surface for the spring period are presented on Figure 2. As expected, the areal extent of GDEs on the dry year (2015) dtw map is much smaller than those produced for the wet (2019) and very wet (2017) years, as spring 2015 groundwater level elevations are lower (deeper) in response to both dry year and drought conditions. In contrast, there is only a slight increase in the areal distribution of GDE areas within 30 feet of the groundwater table when comparing the wet (2019) and very wet (2017) year types. The areal distribution of groundwater within 30 feet of the ground surface during any given year is reduced during the fall period due to the seasonal decline in groundwater surface elevations (Figures 2a and 2b).

2.2 Areas Identified as GDEs

The spring period depth to groundwater maps presented in Figure 2a were used to delineate GDEs as the NCCAG wetland and vegetation class areas that lie within 30 feet of the underlying groundwater table. The limits of potential GDEs for the three years analyzed are presented in Figures 3 through 5. For purposes of the GSU22 we recommend that the GDEs representative of Spring 2019 (Figure 5) be used as the final GDE delineation to be addressed by the GSU22 sustainable management criteria. The rationale for this recommendation includes: 1) the establishment/recruitment and sustainability of GDE wetlands and vegetation is driven more by spring-time groundwater conditions than the fall period; 2) the 2019 delineation is representative of long-term groundwater conditions in which GDEs have become established and are sustainable; and 3) there is a very small difference in GDE distribution between near-average (2019) and very wet (2017) years.

It is important to acknowledge here that this approach at identifying GDEs assumes an unconfined aquifer is in hydraulic connection with the overlying GDEs. As described in the analysis of interconnected surface waters study report (cbec, 2021), there are large areas where intervening confining and semi-confining layers separate the principal Aromas Red Sands aquifer from shallow alluvium hosting GDEs. Along the Pajaro River, the water level elevations in overlying alluvium and deeper Aromas Red Sands are very similar, suggesting these units are in full or partial hydraulic connection with GDEs, even with the presence of the intervening confining layers. In other areas, such as along upper Corralitos Creek, water levels in these units indicate the presence of a perched groundwater in the alluvium above the confining layer that is hydraulically separate from the underlying principal aquifer. Similarly, groundwater dependent

wetlands and vegetation are sustained by perched groundwater systems in the vicinity of College, Pinto and Kelly Lakes and potentially in the upper reaches of other creeks. These perched groundwater systems are not considered water supply aquifers and are hydraulically segregated from the deeper Aromas aquifer that is the principal aquifer. Therefore, the wetlands and vegetation associated with these perched groundwater systems are not considered GDEs under the jurisdiction of the GSP Alternative and are not indicated on the GDE maps.

2.3 Potential Additional GDE Areas

As part of GDE delineation, cbec used aerial imagery from the USDA National Agricultural Imagery Program (NAIP; USDA, 2020) and the U.S. Fish and Wildlife Service National Wetland Inventory (NWI) map (USFWS, 2020) to verify the existence of GDEs. Based on this review, there appears to be some inconsistency between the NCCAG and NWI mapping of wetlands primarily along Harkins, Struve, and Watsonville Sloughs, as well as other smaller isolated areas. In addition, aerial imagery indicates the presence of potential GDE wetlands and riparian vegetation areas along the sloughs not included on NCCAG or NWI maps. These areas are labeled as "Potential Additional GDE (to be verified)" on Figures 3-5 and should be considered data gaps, requiring additional investigation to determine their inclusion as possible GDE.

3.0 Recommendations

This study has identified where potential GDEs may be located within the Pajaro Valley Groundwater Basin. However, it has raised questions about the potential connectivity between GDEs and the principal aquifer of the Basin. Therefore, we recommend the following actions be integrated into the GSU22 Surface and Groundwater Monitoring Plans as next steps in addressing data gaps necessary to develop sustainable management criteria that are protective of GDEs.

- Complete a field reconnaissance to evaluate if Potential Additional GDEs warrant inclusion in the final GDE mapping.
- Implement targeted groundwater monitoring to better evaluate if and where perched and unconfined aquifers connected to GDEs are interacting with the principal confined to semi-confined aquifer. The proposed monitoring approach would be developed in conjunction with further analysis of interconnected surface waters (ISW).
- Implement surface water monitoring to better determine the spatial or temporal variability in gaining and losing conditions in areas of potential surface water and groundwater interaction.
- Where GDEs are influenced by groundwater in the principal aquifer, better define the ecological value of the GDE with priority given to legally protected species or habitat that may need special consideration when setting sustainable management criteria.
- Evaluate the need to incorporate biological data collection into the monitoring network where GDEs are potentially influenced by production and management of the principal aquifer.
- Integrate the findings of existing and on-going characterization of GDEs when developing sustainable management criteria that are protective of GDEs.

4.0 References

California Department of Water Resources (DWR), 2018, Summary of the "Natural Communities Commonly Associated with Groundwater" dataset and online web viewer. Sustainable Groundwater Management Program, April, 17p.

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Klausmeyer K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons, 2018, Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California, 36p.

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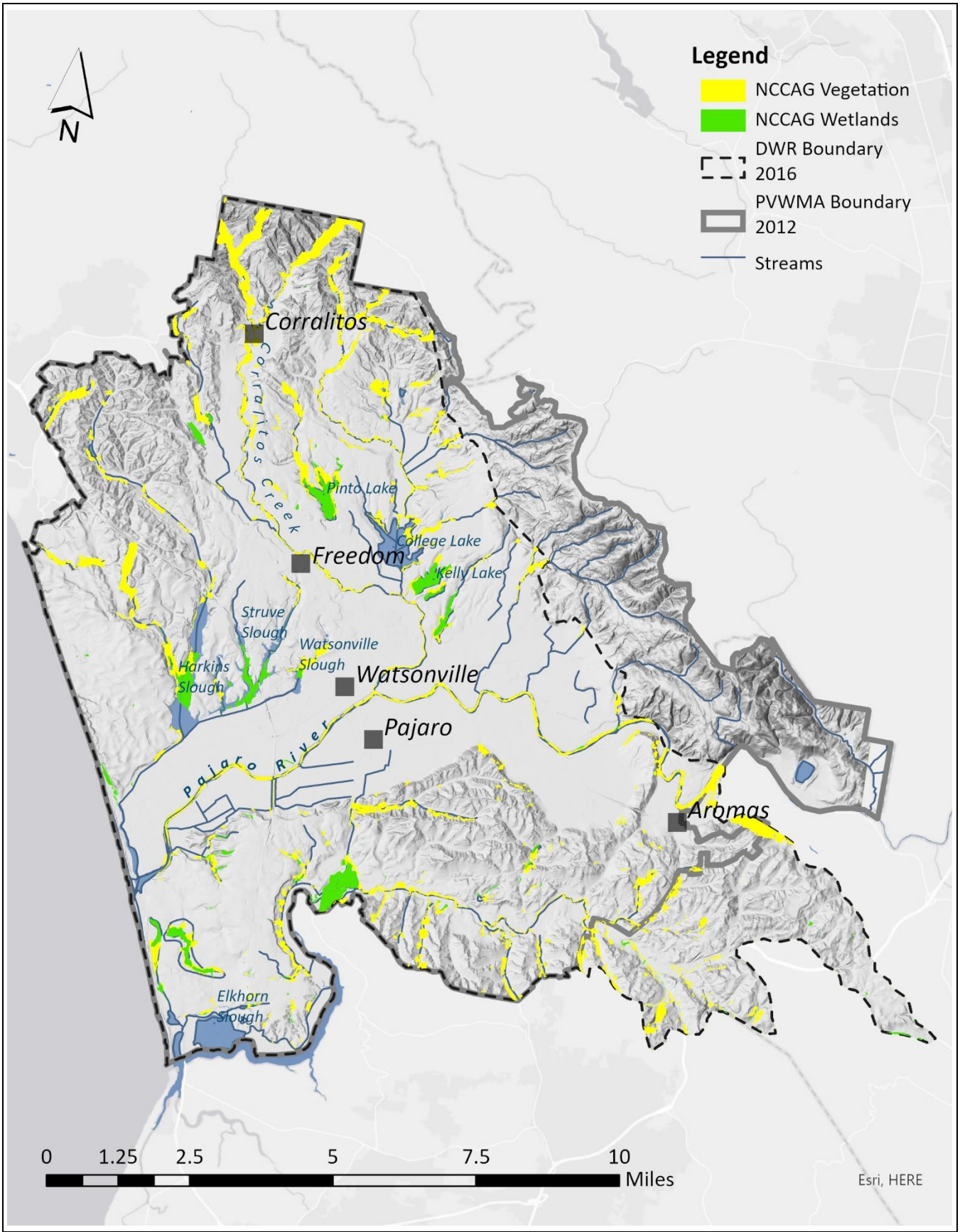
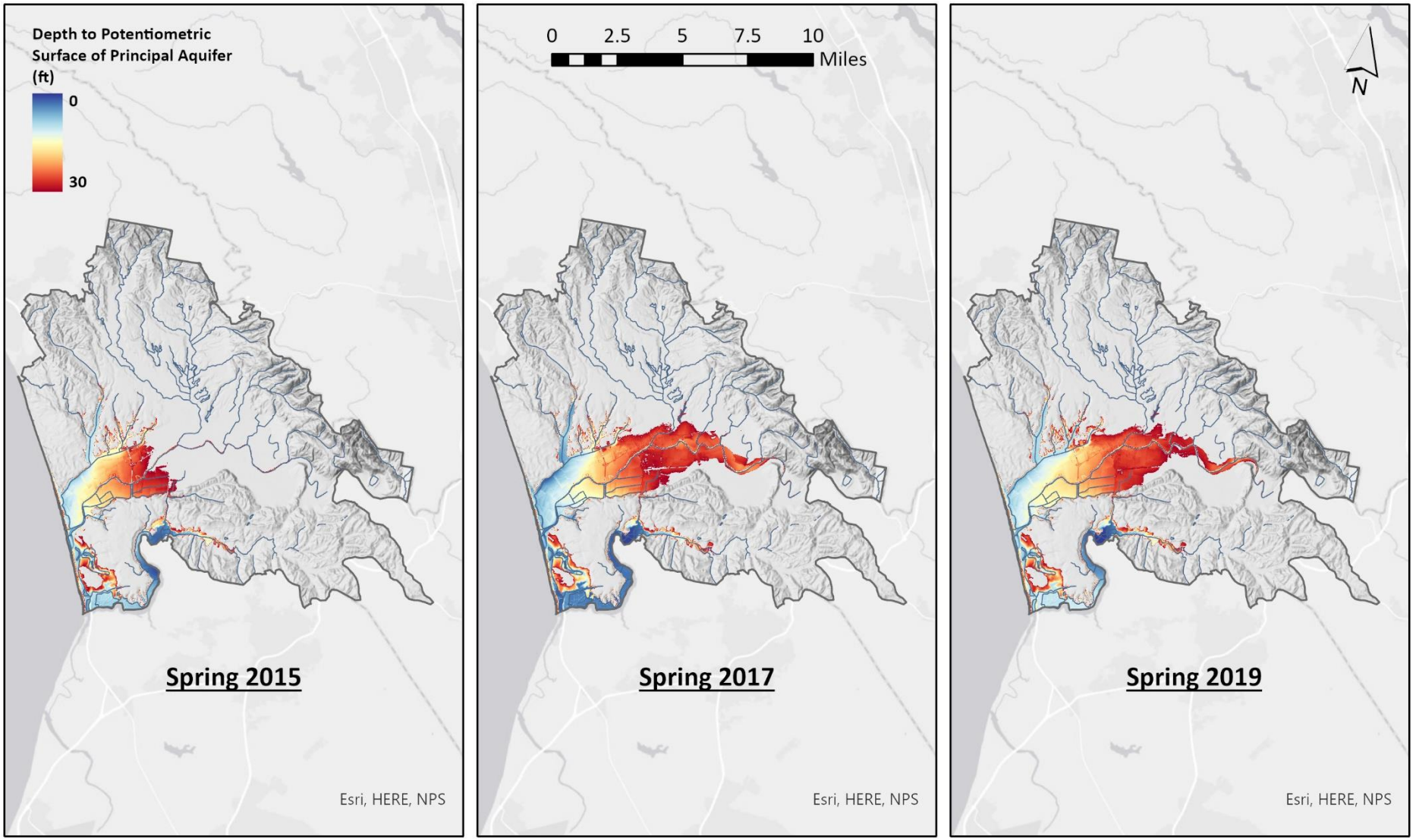
U.S. Fish and Wildlife Service (USFWS), 2020, National Wetlands Inventory. Retrieved from: https://www.fws.gov/wetlands/data/Mapper.html



Notes:	cbec eco engineering	*Basin Management Plan: Groundwater Sustainability Update 2022* **Natural Communities Commonly Associated with Groundwater (NCCAG)**		
		Project No. 20-1030	Created By: GS	**Figure 1**



Notes: The areas shaded in color indicate where dtw ranges from 0 to 30 feet below ground surface (bgs), while groundwater elevations are greater than 30 feet bgs in unshaded areas.

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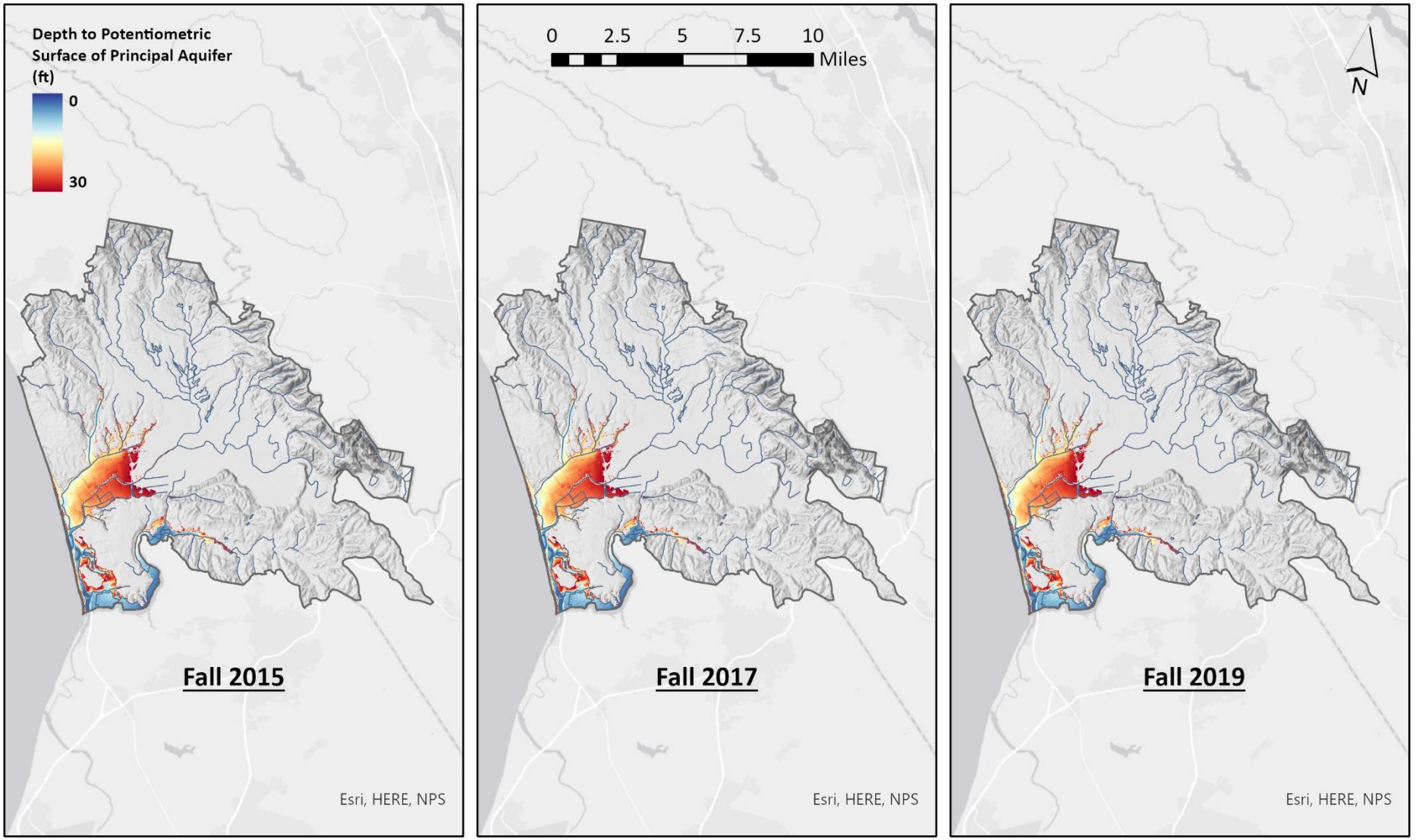
Pajaro Valley Water GSP – Alternative Update

Groundwater Levels within 30 feet of the Ground Surface

Project No. 20-1030	Created By: GRS	**Figure 2a**



Notes: The areas shaded in color indicate where dtw ranges from 0 to 30 feet below ground surface (bgs), while groundwater elevations are greater than 30 feet bgs in unshaded areas.

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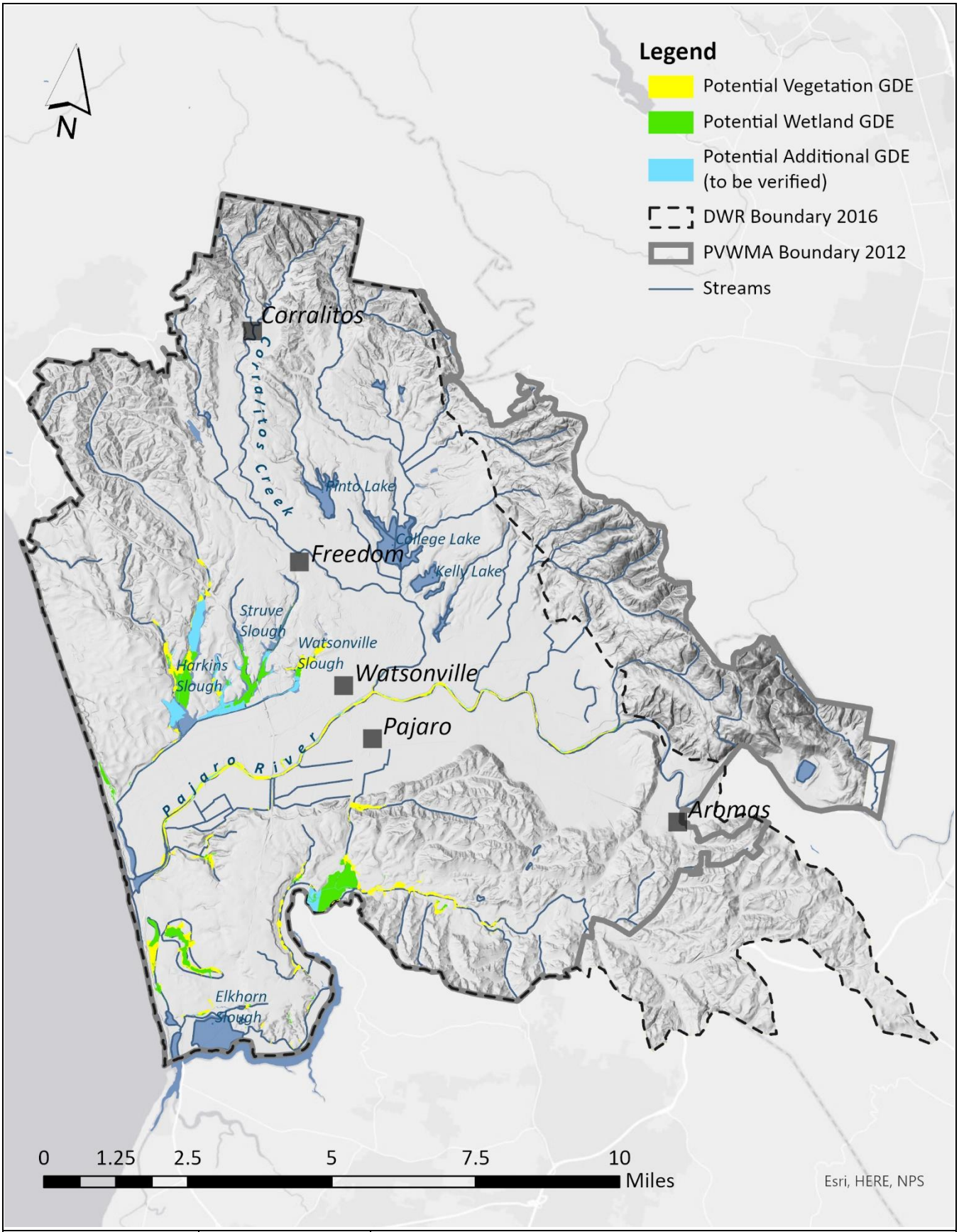
Basin Management Plan: Groundwater Sustainability Update 2022

Groundwater Levels within 30 feet of Ground Surface

Project No. 20-1030	Created By: GRS	**Figure 2b**



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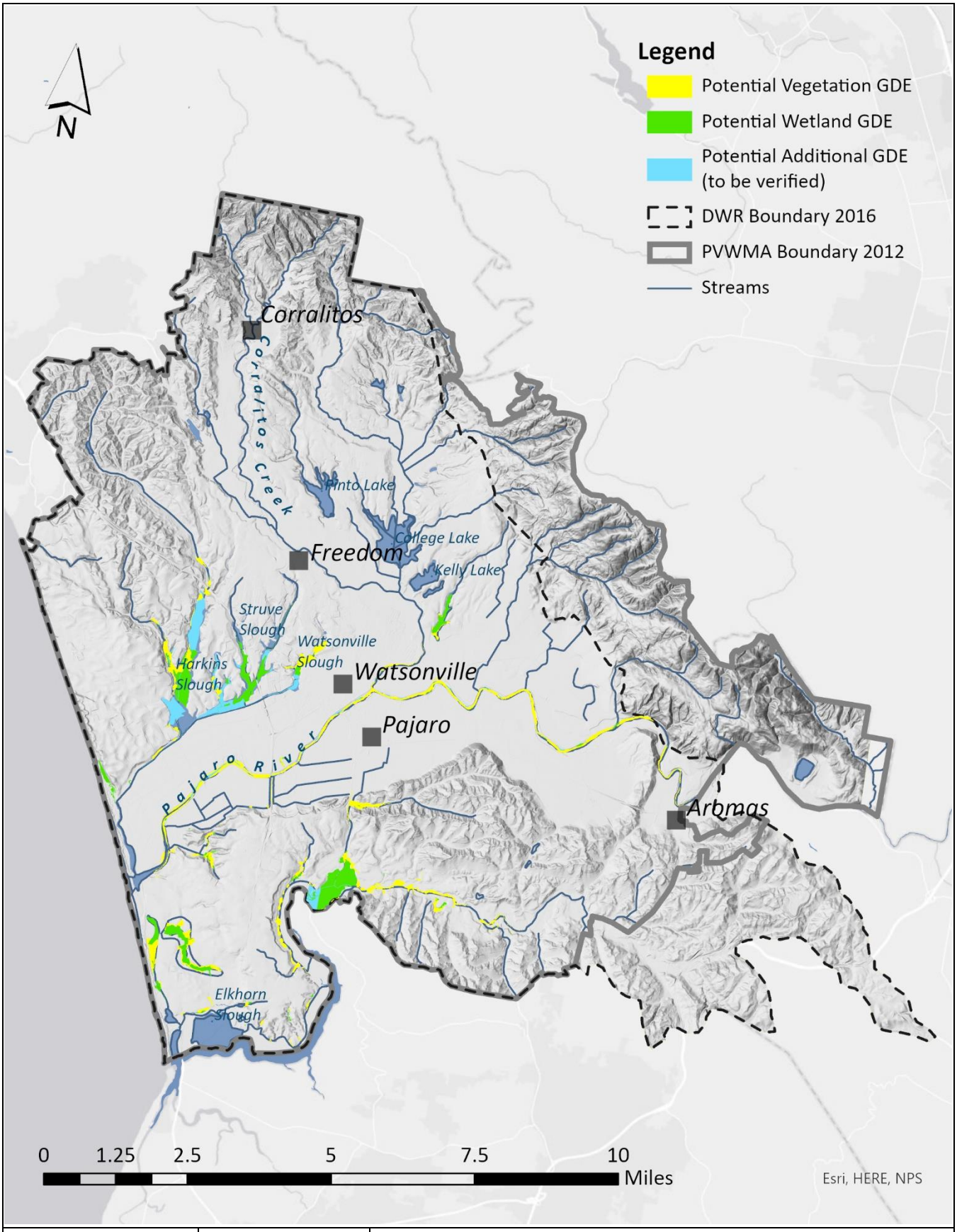
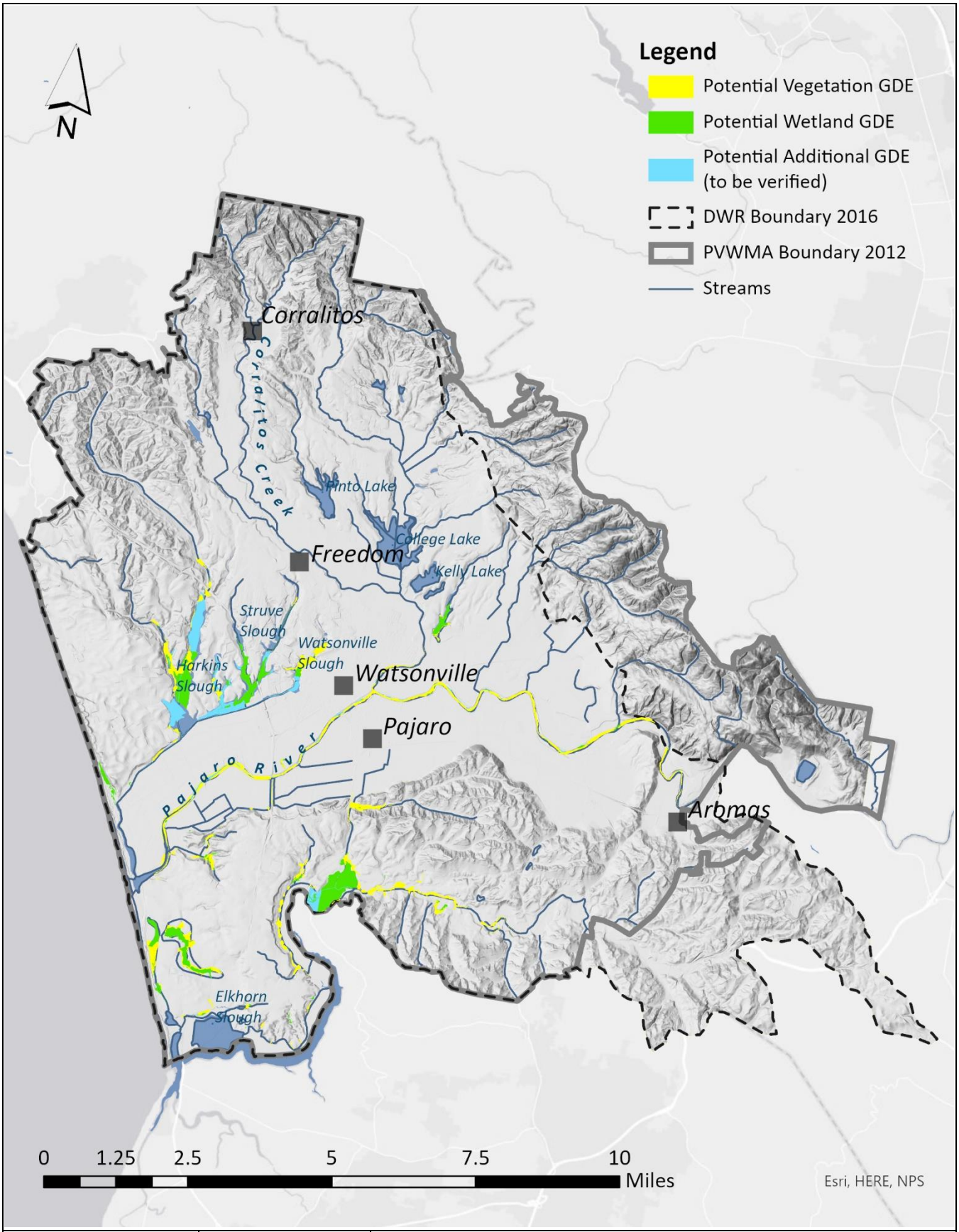
Basin Management Plan: Groundwater Sustainability Update 2022

Potential Groundwater Dependent Ecosystems – Spring 2015

Project No. 20-1030	Created By: GS	**Figure 3**



Notes:	cbec eco engineering	*Basin Management Plan: Groundwater Sustainability Update 2022* **Potential Groundwater Dependent Ecosystems – Spring 2017**		
		Project No. 20-1030	Created By: GS	**Figure 4**



Notes:

Basin Management Plan: Groundwater Sustainability Update 2022

Potential Groundwater Dependent Ecosystems – Spring 2019

Project No. 20-1030	Created By: GS	**Figure 5**

Table 1: List of Potential Freshwater Species, Pajaro River and Corralitos Creek Watersheds

Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Actitis macularius	Spotted Sandpiper	Birds		
Aechmophorus clarkii	Clark's Grebe	Birds		
Aechmophorus occidentalis	Western Grebe	Birds		
Agelaius tricolor	**Tricolored Blackbird**	**Birds**	**Bird of Conservation Concern**	**Special Concern**
Aix sponsa	Wood Duck	Birds		
Anas acuta	Northern Pintail	Birds		
Anas americana	American Wigeon	Birds		
Anas clypeata	Northern Shoveler	Birds		
Anas crecca	Green-winged Teal	Birds		
Anas cyanoptera	Cinnamon Teal	Birds		
Anas discors	Blue-winged Teal	Birds		
Anas platyrhynchos	Mallard	Birds		
Anas strepera	Gadwall	Birds		
Anser albifrons	Greater White-fronted Goose	Birds		
Ardea alba	Great Egret	Birds		
Ardea herodias	Great Blue Heron	Birds		
Aythya affinis	Lesser Scaup	Birds		
Aythya americana	**Redhead**	**Birds**		**Special Concern**
Aythya collaris	Ring-necked Duck	Birds		
Aythya marila	Greater Scaup	Birds		
Aythya valisineria	**Canvasback**	**Birds**		**Special**
Botaurus lentiginosus	American Bittern	Birds		
Bucephala albeola	Bufflehead	Birds		
Bucephala clangula	Common Goldeneye	Birds		
Butorides virescens	Green Heron	Birds		
Calidris alpina	Dunlin	Birds		
Calidris mauri	Western Sandpiper	Birds		
Calidris minutilla	Least Sandpiper	Birds		
Chen caerulescens	Snow Goose	Birds		
Chen rossii	Ross's Goose	Birds		
Chlidonias niger	**Black Tern**	**Birds**		**Special Concern**
Chroicocephalus philadelphia	Bonaparte's Gull	Birds		
Cinclus mexicanus	American Dipper	Birds		
Cistothorus palustris palustris	Marsh Wren	Birds		
Cygnus columbianus	Tundra Swan	Birds		
Cypseloides niger	**Black Swift**	**Birds**	**Bird of Conservation Concern**	**Special Concern**
Egretta thula	Snowy Egret	Birds		
Empidonax traillii	**Willow Flycatcher**	**Birds**	**Bird of Conservation Concern**	**Endangered**
Fulica americana	American Coot	Birds		
Gallinago delicata	Wilson's Snipe	Birds		
Geothlypis trichas trichas	Common Yellowthroat	Birds		
Grus canadensis	Sandhill Crane	Birds		
Haliaeetus leucocephalus	**Bald Eagle**	**Birds**	**Bird of Conservation Concern**	**Endangered**
Himantopus mexicanus	Black-necked Stilt	Birds		
Histrionicus histrionicus	**Harlequin Duck**	**Birds**		**Special Concern**
Icteria virens	**Yellow-breasted Chat**	**Birds**		**Special Concern**
Limnodromus scolopaceus	Long-billed Dowitcher	Birds		
Lophodytes cucullatus	Hooded Merganser	Birds		
Megaceryle alcyon	Belted Kingfisher	Birds		
Mergus merganser	Common Merganser	Birds		
Mergus serrator	Red-breasted Merganser	Birds		

Table 1: List of Potential Freshwater Species, Pajaro River and Corralitos Creek Watersheds

Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Numenius americanus	Long-billed Curlew	Birds		
Numenius phaeopus	Whimbrel	Birds		
Nycticorax nycticorax	Black-crowned Night-Heron	Birds		
Oreothlypis luciae	**Lucy's Warbler**	**Birds**		**Special Concern**
Oxyura jamaicensis	Ruddy Duck	Birds		
Pelecanus erythrorhynchos	**American White Pelican**	**Birds**		**Special Concern**
Phalacrocorax auritus	Double-crested Cormorant	Birds		
Phalaropus tricolor	Wilson's Phalarope	Birds		
Piranga rubra	**Summer Tanager**	**Birds**		**Special Concern**
Plegadis chihi	**White-faced Ibis**	**Birds**		**Watch list**
Pluvialis squatarola	Black-bellied Plover	Birds		
Podiceps nigricollis	Eared Grebe	Birds		
Podilymbus podiceps	Pied-billed Grebe	Birds		
Porzana carolina	Sora	Birds		
Rallus limicola	Virginia Rail	Birds		
Recurvirostra americana	American Avocet	Birds		
Riparia riparia	**Bank Swallow**	**Birds**		**Threatened**
Rynchops niger	Black Skimmer	Birds		
Setophaga petechia	Yellow Warbler	Birds		
Tachycineta bicolor	Tree Swallow	Birds		
Tringa melanoleuca	Greater Yellowlegs	Birds		
Tringa semipalmata	Willet	Birds		
Tringa solitaria	Solitary Sandpiper	Birds		
Xanthocephalus xanthocephalus	**Yellow-headed Blackbird**	**Birds**		**Special Concern**
Americorophium spinicorne		Crustaceans		
Americorophium spp.	Americorophium spp.	Crustaceans		
Americorophium stimpsoni		Crustaceans		
Cyprididae fam.	Cyprididae fam.	Crustaceans		
Gammaridae fam.	Gammaridae fam.	Crustaceans		
Gammarus spp.	Gammarus spp.	Crustaceans		
Gnorimosphaeroma spp.	Gnorimosphaeroma spp.	Crustaceans		
Neomysis mercedis		Crustaceans		
Eucyclogobius newberryi	**Tidewater goby**	**Fishes**	**Endangered**	**Special Concern**
Oncorhynchus mykiss - SCCC	**South Central California coast steelhea**	**Fishes**	**Threatened**	**Special Concern**
Oncorhynchus mykiss irideus	Coastal rainbow trout	Fishes		
Actinemys marmorata marmorata	**Western Pond Turtle**	**Herps**		**Special Concern**
Ambystoma californiense californiense	**California Tiger Salamander**	**Herps**	**Threatened**	**Threatened**
Ambystoma macrodactylum	Long-toed salamander	Herps		
Ambystoma macrodactylum croceum	**Santa Cruz Long-toed Salamander**	**Herps**	**Endangered**	**Endangered**
Anaxyrus boreas boreas	Boreal Toad	Herps		
Anaxyrus boreas halophilus	California Toad	Herps		
Dicamptodon ensatus	California Giant Salamander	Herps		
Pseudacris regilla	Northern Pacific Chorus Frog	Herps		
Pseudacris sierra	Sierran Treefrog	Herps		
Rana boylii	**Foothill Yellow-legged Frog**	**Herps**	**Under Review in the Candidate or Petition Process**	**Special Concern**
Rana draytonii	**California Red-legged Frog**	**Herps**	**Threatened**	**Special Concern**
Spea hammondii	**Western Spadefoot**	**Herps**	**Under Review in the Candidate or Petition Process**	**Special Concern**
Taricha granulosa	Rough-skinned Newt	Herps		
Taricha torosa	**Coast Range Newt**	**Herps**		**Special Concern**

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Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Thamnophis elegans elegans	Mountain Gartersnake	Herps		
Thamnophis elegans terrestris	Coast Gartersnake	Herps		
Thamnophis sirtalis sirtalis	Common Gartersnake	Herps		
Ablabesmyia spp.	Ablabesmyia spp.	Insects & other inverts		
Aeshnidae fam.	Aeshnidae fam.	Insects & other inverts		
Agapetus spp.	Agapetus spp.	Insects & other inverts		
Amiocentrus aspilus	A Caddisfly	Insects & other inverts		
Amphizoa insolens		Insects & other inverts		
Antocha monticola		Insects & other inverts		
Antocha spp.	Antocha spp.	Insects & other inverts		
Baetis spp.	Baetis spp.	Insects & other inverts		
Baetis tricaudatus	A Mayfly	Insects & other inverts		
Brillia spp.	Brillia spp.	Insects & other inverts		
Brundiniella spp.	Brundiniella spp.	Insects & other inverts		
Calineuria californica	Western Stone	Insects & other inverts		
Callibaetis spp.	Callibaetis spp.	Insects & other inverts		
Centroptilum spp.	Centroptilum spp.	Insects & other inverts		
Chironomidae fam.	Chironomidae fam.	Insects & other inverts		
Chironomus spp.	Chironomus spp.	Insects & other inverts		
Cinygmula spp.	Cinygmula spp.	Insects & other inverts		
Cladotanytarsus spp.	Cladotanytarsus spp.	Insects & other inverts		
Coenagrionidae fam.	Coenagrionidae fam.	Insects & other inverts		
Corisella spp.	Corisella spp.	Insects & other inverts		
Corixidae fam.	Corixidae fam.	Insects & other inverts		
Cricotopus spp.	Cricotopus spp.	Insects & other inverts		
Dicrotendipes spp.	Dicrotendipes spp.	Insects & other inverts		
Diphetor hageni	Hagen's Small Minnow Mayfly	Insects & other inverts		
Dixidae fam.	Dixidae fam.	Insects & other inverts		
Drunella coloradensis	A Mayfly	Insects & other inverts		
Drunella spp.	Drunella spp.	Insects & other inverts		
Dubiraphia spp.	Dubiraphia spp.	Insects & other inverts		
Ecdyonurus spp.	Ecdyonurus spp.	Insects & other inverts		
Endochironomus spp.	Endochironomus spp.	Insects & other inverts		
Epeorus spp.	Epeorus spp.	Insects & other inverts		
Ephemerella excrucians	A Mayfly	Insects & other inverts		
Ephemerella maculata	A Mayfly	Insects & other inverts		
Ephemerella spp.	Ephemerella spp.	Insects & other inverts		
Ephemerellidae fam.	Ephemerellidae fam.	Insects & other inverts		
Ephydridae fam.	Ephydridae fam.	Insects & other inverts		
Eubrianax edwardsii		Insects & other inverts		
Eukiefferiella claripennis		Insects & other inverts		
Eukiefferiella spp.	Eukiefferiella spp.	Insects & other inverts		
Eurylophella lodi	A Mayfly	Insects & other inverts		
Fallceon quilleri	A Mayfly	Insects & other inverts		
Glossosoma spp.	Glossosoma spp.	Insects & other inverts		
Glossosomatidae fam.	Glossosomatidae fam.	Insects & other inverts		
Gumaga spp.	Gumaga spp.	Insects & other inverts		
Gyrinus spp.	Gyrinus spp.	Insects & other inverts		
Heptageniidae fam.	Heptageniidae fam.	Insects & other inverts		
Hesperoperla pacifica	Golden Stone	Insects & other inverts		
Hesperoperla spp.	Hesperoperla spp.	Insects & other inverts		

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Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Hetaerina americana	American Rubyspot	Insects & other inverts		
Heterotrissocladius spp.	Heterotrissocladius spp.	Insects & other inverts		
Hydatophylax spp.	Hydatophylax spp.	Insects & other inverts		
Hydrophilidae fam.	Hydrophilidae fam.	Insects & other inverts		
Hydropsyche spp.	Hydropsyche spp.	Insects & other inverts		
Hydropsychidae fam.	Hydropsychidae fam.	Insects & other inverts		
Hydroptila spp.	Hydroptila spp.	Insects & other inverts		
Ironodes spp.	Ironodes spp.	Insects & other inverts		
Isoperla spp.	Isoperla spp.	Insects & other inverts		
Lepidostoma spp.	Lepidostoma spp.	Insects & other inverts		
Leucrocuta spp.	Leucrocuta spp.	Insects & other inverts		
Limnophyes spp.	Limnophyes spp.	Insects & other inverts		
Malenka spp.	Malenka spp.	Insects & other inverts		
Maruina lanceolata		Insects & other inverts		
Matriella teresa	A Mayfly	Insects & other inverts		
Micropsectra spp.	Micropsectra spp.	Insects & other inverts		
Microtendipes pedellus		Insects & other inverts		
Microtendipes spp.	Microtendipes spp.	Insects & other inverts		
Mideopsis spp.	Mideopsis spp.	Insects & other inverts		
Nectopsyche spp.	Nectopsyche spp.	Insects & other inverts		
Neophylax rickeri	A Caddisfly	Insects & other inverts		
Neophylax spp.	Neophylax spp.	Insects & other inverts		
Nereis spp.	Nereis spp.	Insects & other inverts		
Nixe spp.	Nixe spp.	Insects & other inverts		
Ochrotrichia spp.	Ochrotrichia spp.	Insects & other inverts		
Optioservus divergens		Insects & other inverts		
Optioservus quadrimaculatus		Insects & other inverts		
Optioservus spp.	Optioservus spp.	Insects & other inverts		
Oxyethira spp.	Oxyethira spp.	Insects & other inverts		
Paracladopelma spp.	Paracladopelma spp.	Insects & other inverts		
Parakiefferiella spp.	Parakiefferiella spp.	Insects & other inverts		
Paraleptophlebia spp.	Paraleptophlebia spp.	Insects & other inverts		
Parametriocnemus spp.	Parametriocnemus spp.	Insects & other inverts		
Paratanytarsus spp.	Paratanytarsus spp.	Insects & other inverts		
Paratendipes spp.	Paratendipes spp.	Insects & other inverts		
Phaenopsectra spp.	Phaenopsectra spp.	Insects & other inverts		
Polypedilum scalaenum		Insects & other inverts		
Polypedilum spp.	Polypedilum spp.	Insects & other inverts		
Polypedilum tritum		Insects & other inverts		
Pseudochironomus spp.	Pseudochironomus spp.	Insects & other inverts		
Psychodidae fam.	Psychodidae fam.	Insects & other inverts		
Psychoglypha spp.	Psychoglypha spp.	Insects & other inverts		
Rheotanytarsus spp.	Rheotanytarsus spp.	Insects & other inverts		
Rhithrogena spp.	Rhithrogena spp.	Insects & other inverts		
Rhyacophila betteni	A Caddisfly	Insects & other inverts		
Rhyacophila spp.	Rhyacophila spp.	Insects & other inverts		
Sanfilippodytes spp.	Sanfilippodytes spp.	Insects & other inverts		
Serratella spp.	Serratella spp.	Insects & other inverts		
Sigara mckinstryi	A Water Boatman	Insects & other inverts		
Sigara spp.	Sigara spp.	Insects & other inverts		
Simuliidae fam.	Simuliidae fam.	Insects & other inverts		

Table 1: List of Potential Freshwater Species, Pajaro River and Corralitos Creek Watersheds

Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Simulium piperi		Insects & other inverts		
Simulium spp.	Simulium spp.	Insects & other inverts		
Sperchon spp.	Sperchon spp.	Insects & other inverts		
Suwallia spp.	Suwallia spp.	Insects & other inverts		
Sweltsa spp.	Sweltsa spp.	Insects & other inverts		
Tanytarsus spp.	Tanytarsus spp.	Insects & other inverts		
Thienemannimyia spp.	Thienemannimyia spp.	Insects & other inverts		
Tricorythodes spp.	Tricorythodes spp.	Insects & other inverts		
Tropisternus spp.	Tropisternus spp.	Insects & other inverts		
Tvetenia spp.	Tvetenia spp.	Insects & other inverts		
Wormaldia spp.	Wormaldia spp.	Insects & other inverts		
Zaitzevia spp.	Zaitzevia spp.	Insects & other inverts		
Zapada spp.	Zapada spp.	Insects & other inverts		
Zavrelimyia spp.	Zavrelimyia spp.	Insects & other inverts		
Zoniagrion exclamationis	Exclamation Damsel	Insects & other inverts		
Lontra canadensis canadensis	North American River Otter	Mammals		
Anodonta californiensis	**California Floater**	**Mollusks**		**Special**
Ferrissia spp.	Ferrissia spp.	Mollusks		
Fluminicola spp.	Fluminicola spp.	Mollusks		
Galba spp.	Galba spp.	Mollusks		
Gyraulus spp.	Gyraulus spp.	Mollusks		
Helisoma spp.	Helisoma spp.	Mollusks		
Hydrobiidae fam.	Hydrobiidae fam.	Mollusks		
Lymnaea spp.	Lymnaea spp.	Mollusks		
Lymnaeidae fam.	Lymnaeidae fam.	Mollusks		
Physa spp.	Physa spp.	Mollusks		
Pisidium spp.	Pisidium spp.	Mollusks		
Planorbella subcrenata	Rough Rams-horn	Mollusks		
Planorbidae fam.	Planorbidae fam.	Mollusks		
Sphaeriidae fam.	Sphaeriidae fam.	Mollusks		
Stagnicola elodes	Marsh Pondsnail	Mollusks		
Arundo donax	NA	Plants		
Bidens laevis	Smooth Bur-marigold	Plants		
Callitriche palustris	Vernal Water-starwort	Plants		
Carex schottii	Schott's Sedge	Plants		
Cotula coronopifolia	NA	Plants		
Cyperus erythrorhizos	Red-root Flatsedge	Plants		
Eleocharis ovata		Plants		
Eragrostis hypnoides	Teal Lovegrass	Plants		
Euthamia occidentalis	Western Fragrant Goldenrod	Plants		
Isolepis cernua	Low Bulrush	Plants		
Jaumea carnosa	Fleshy Jaumea	Plants		
Juncus falcatus falcatus	Sickle-leaf Rush	Plants		
Lemna minor	Lesser Duckweed	Plants		
Lepidium oxycarpum	Sharp-pod Pepper-grass	Plants		
Ludwigia peploides peploides	NA	Plants		
Mimulus guttatus	Common Large Monkeyflower	Plants		
Myriophyllum aquaticum	NA	Plants		
Persicaria amphibia		Plants		
Persicaria lapathifolia		Plants		
Phyllospadix scouleri	Scouler's Surf-grass	Plants		

Table 1: List of Potential Freshwater Species, Pajaro River and Corralitos Creek Watersheds

Scientific Name	Common Name	Group	Federal Protection Status	State Protection Status
Plagiobothrys chorisianus	**NA**	**Plants**		**Special**
Platanus racemosa	California Sycamore	Plants		
Populus trichocarpa	NA	Plants		
Potentilla anserina pacifica		Plants		
Psilocarphus brevissimus brevissimus	Dwarf Woolly-heads	Plants		
Ranunculus pusillus pusillus	Pursh's Buttercup	Plants		
Ranunculus repens	NA	Plants		
Salix lasiolepis lasiolepis	Arroyo Willow	Plants		
Sequoia sempervirens		Plants		
Sparganium eurycarpum eurycarpum		Plants		
Typha latifolia	Broadleaf Cattail	Plants		
Veronica anagallis-aquatica	NA	Plants		
Wolffiella lingulata	Tongue Bogmat	Plants		