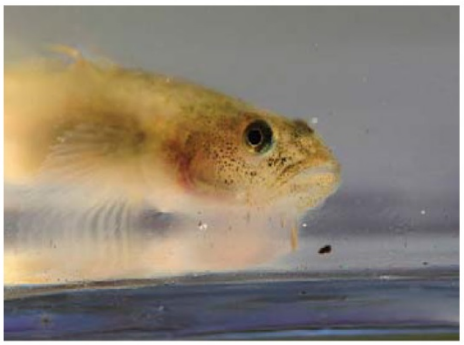

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DUDEK

BASH INCORPORATED

Goleta Slough Mouth Management
Biological Assessment

Submitted to:

City of Santa Barbara
Airport Department
601 Norman Firestone Road
Santa Barbara, CA 93117

BIOLOGICAL ASSESSMENT
FOR GOLETA SLOUGH MOUTH MANAGEMENT

CITY OF SANTA BARBARA
AIRPORT DEPARTMENT
SANTA BARBARA, CALIFORNIA

Prepared for:

City of Santa Barbara
Airport Department
601 Norman Firestone Road
Santa Barbara, CA 93117

Prepared by

Rincon Consultants, Inc.
Stillwater Sciences
Dudek
BASH Incorporated

July 2015

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1.0 INTRODUCTION

The City of Santa Barbara (City) proposes to implement the Goleta Slough Mouth Management Project (the Proposed Action). The mouth of Goleta Slough naturally closes with beach sand periodically, increasing water levels in the slough, which in turn increase flood risks, attract a larger population of waterfowl, and potentially support larger populations of mosquitos. The Goleta Slough Mouth Management Project identifies management actions to control high water levels in Goleta Slough to minimize bird strike hazards at the Santa Barbara Airport, reduce flood risk, and manage mosquitos while balancing needs of sensitive species that rely on aquatic habitat provided by Goleta Slough. The City has authorized Rincon Consultants, Inc., Stillwater Sciences, Dudek, and BASH Incorporated, hereinafter referred to as "the consultant team," to prepare this Biological Assessment (BA) on their behalf, which is intended to achieve compliance with Section 7 of the federal Endangered Species Act (ESA).

As part of ensuring compliance with the Clean Water Act, the U.S. Army Corps of Engineers (USACE) must initiate consultations with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) to ensure compliance with Section 7 of the ESA due to the presence of federally listed species and designated critical habitat under the jurisdiction of NMFS and USFWS in the Action Area.

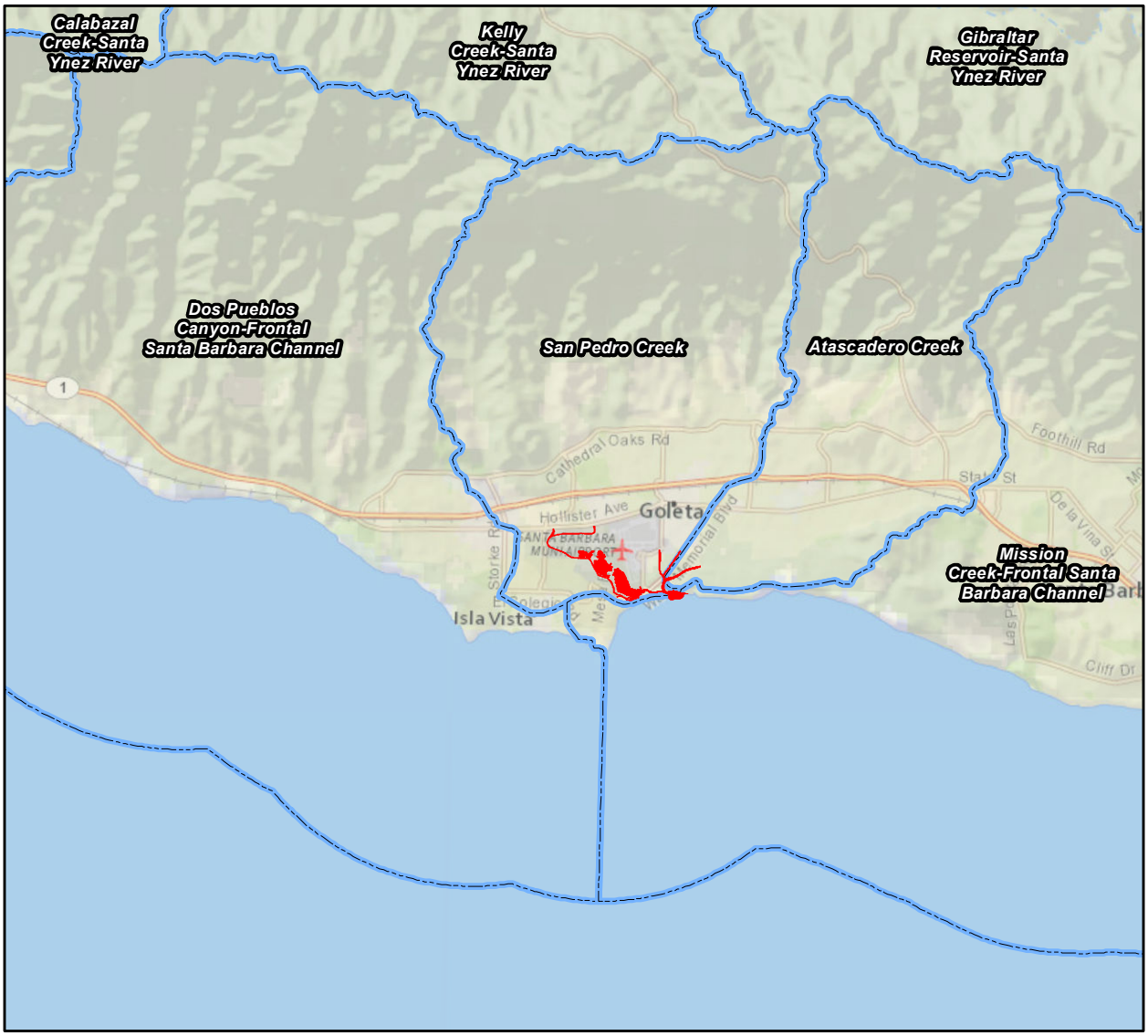
1.1 REGULATORY FRAMEWORK

Under provisions of Section 7(a)(2) of the ESA, a Federal agency reviewing a proposed project within its jurisdiction must insure that actions "authorized, funded, or carried out by" a federal agency are not likely to jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated or proposed critical habitat for such species, unless the agency has been granted an exception allowing specified levels of incidental take otherwise prohibited by the ESA. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. This determination is done in consultation with USFWS and NMFS, who share responsibility for implementing ESA (16 USC § 153 *et seq.)*. USFWS generally implements the ESA for terrestrial and freshwater species, while NMFS implements the ESA for marine and anadromous species.

This BA was prepared in accordance with the process outlined in Section 7(c) of the ESA (16 U.S.C. §1536(c)), using the best currently available scientific data.

1.2 PROPOSED ACTION LOCATION

The Proposed Action location is in the City of Santa Barbara, Santa Barbara County, California, within the Santa Barbara Airport annexation parcel, adjacent to the Goleta City limit, and extends into unincorporated Santa Barbara County near Atascadero and San Pedro Creeks (Figure 1). The Action Area includes the Goleta Slough and its surrounding wetland, riparian, and beach habitats, and Goleta Beach County Park as described in more detail in Section 4.0 (Figure 2). The site is within the *Goleta, California* U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. Section 4 provides additional discussion of location the environmental setting.



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Study Area

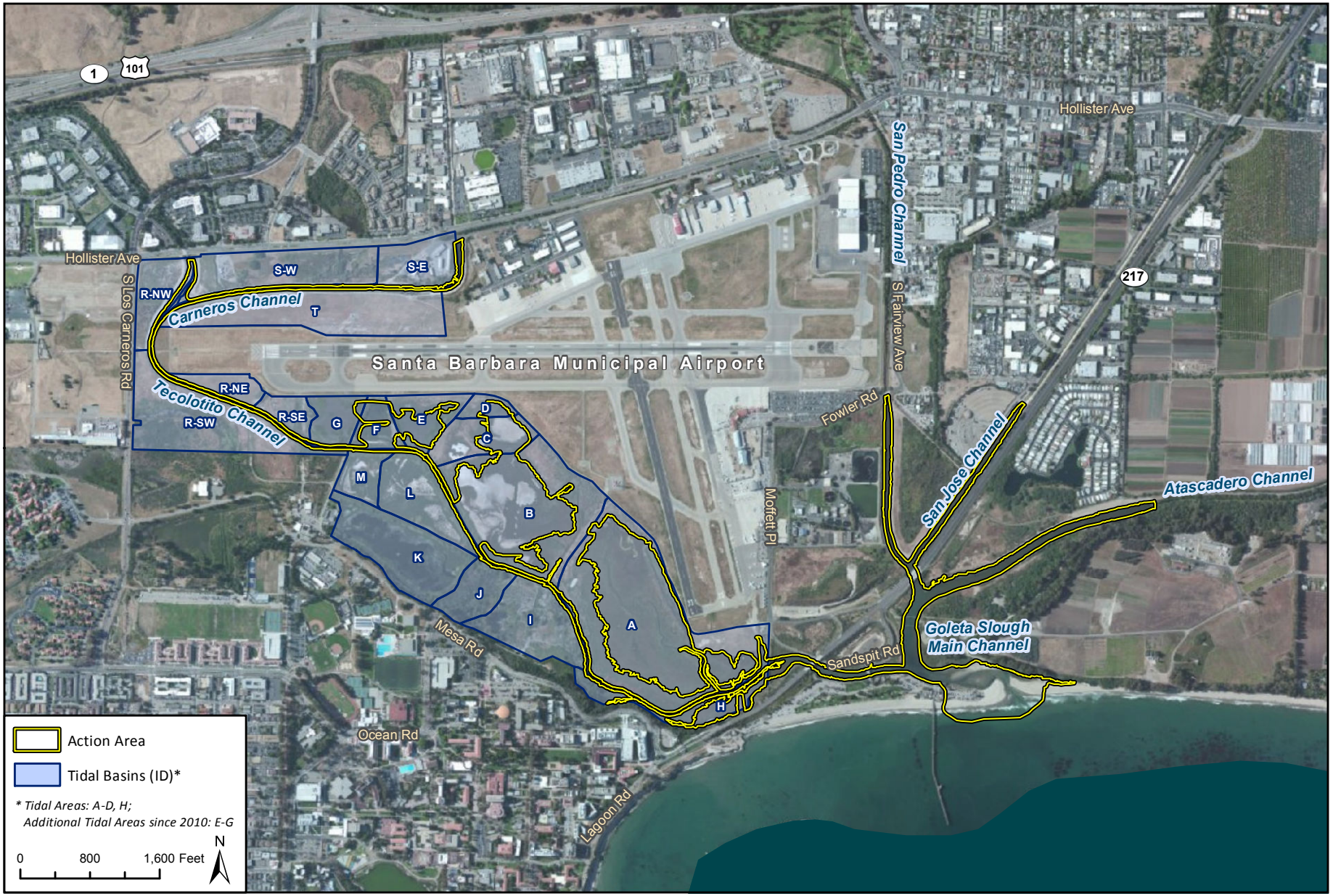
Watershed Boundary

0 1.25 2.5
Miles

N

Vicinity Map

Figure 1



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Action Area

Figure 2

2.0 PURPOSE AND NEED OF PROPOSED ACTION

The Santa Barbara Airport is adjacent to the Goleta Slough. During storms the Airport is subject to flooding from the Slough. Prior to 2012, Santa Barbara County Flood Control District would address natural closures to the slough resulting from buildup of beach sand at the mouth of Goleta Slough by periodically cutting a channel through sand buildup to allow tidal water movement in and out of the Slough. This maintenance action was routinely implemented within two weeks of closure to avoid high standing water and to avoid fish kills from low oxygen levels that occur with a closed mouth. (Staghorn sculpin (*Leptocottus armalus*) and topsmelt (*Atherinops affinis*) were observed killed by stagnant water conditions during the closure of the mouth of the Slough in fall 1995 and again in 2007 [Padre and Associates 2010]). In addition, maintenance of open mouth conditions was support by thinking expressed in the Draft Goleta Slough Ecosystem Management Plan, a document prepared by the Goleta Slough Management Committee (GSMC; 1997) in collaboration with agencies and local stakeholders. GSMC (1997) documented the historical condition of the slough as a tidal estuary and included policies and actions that assumed increased tidal circulation was beneficial to the ecosystem. A number of tidal restoration projects have been conducted in the Goleta Slough in support of this effort to recreate historic ecosystem conditions (City of Santa Barbara 2010).

The practice of breaching the sand bar at the slough mouth within two weeks of closure was discontinued when the existing permits expired in 2012. The resulting change to hydrology of the slough resulted in measurable changes to water height and associated waterfowl abundance. Since this management was discontinued in 2012, four emergency permits have been required to abate flood risks and a tenfold increase in high-hazard migratory fowl (e.g., Canada geese, mallards and other ducks, double-crested cormorants, and great blue herons) near the airfield. Additionally, high water conditions have resulted in a potential public health risk by increasing suitable mosquito breeding habitat when the mouth of the slough is closed. The Santa Barbara County Vector Control District has seen a hundredfold increase in mosquito population in the Goleta Slough under closed-mouth conditions (Mosquito and Vector Management District of Santa Barbara County 2014). Given the Slough's proximity to UC Santa Barbara, this has been identified as a significant public health risk. The change in slough mouth management also has implications for water quality, aquatic habitat, and abundance and quality of vegetated marsh habitat versus open water.

Management decisions affecting wildlife and water quality in the Slough have safety implications for the airport when those decisions affect bird strike risk and flooding hazards. The following subsections provide additional detail on factors informing the purpose and need for the proposed Project.

2.1 FLOODING AND HIGH-WATER HAZARDS

Since this management was discontinued in 2012, four emergency permits have been required to abate flood risks and increases in high-hazard migratory fowl (e.g., Canada geese, mallards, coots) associated with high water conditions near the airfield. In fall 2012, an emergency permit was obtained to open the slough mouth immediately ahead of winter storms. The slough mouth closed again by March 2013, and late rains caused substantial increases in water height in the Slough. In May 2013, an emergency permit was obtained to siphon water from the slough. The

siphon setup was problematic, and water rates dropped more slowly than expected, but ultimately water levels were reduced to 5.5 feet above mean sea level (City of Santa Barbara 2013). In late February 2014, water levels again rose rapidly in the slough during a large rain storm, resulting in imminent risk of flooding at the airport. An emergency permit was obtained and the slough mouth was breached on February 28, 2014.

On December 2, 2014, almost 2 inches of rain fell between 7:30 a.m. and 2 p.m., again resulting in rapid increase in water surface elevation (WSE) in the slough, with an increase of almost 2 feet over approximately 6.5 hours, causing imminent risk of flooding at the airport. Photos 1 through 4 illustrate conditions at 7:30 a.m. side by side with conditions at 2 p.m. on December 2. Photo 5 illustrates conditions by 4:35 p.m. of December 2, 2015 when risk of flooding at the airport was imminent.

Photo 1. Basin A and Runways 15-33L-R from UCSB Bluff, 7:30 a.m. on December 2, 2014.

Photo 2. Basin A and Runways 15-33L-R from UCSB Bluff, 2 p.m. on December 2, 2014.

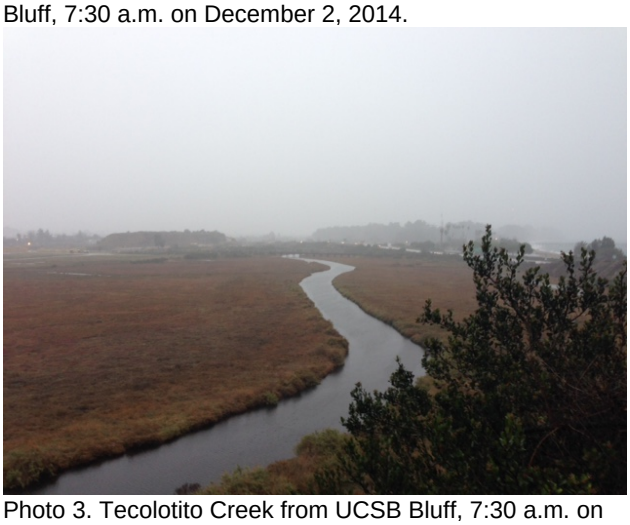


Photo 3. Tecolotito Creek from UCSB Bluff, 7:30 a.m. on December 2, 2014.

Photo 4.Tecolotito Creek from UCSB Bluff, 2 p.m. on December 2, 2014.

Photo 5.Tecolotito Creek from UCSB Bluff, 4:35 p.m. on December 2, 2014. At this WSE, risk of flooding the airport is imminent.

Photo 6.Tecolotito Creek from UCSB Bluff, 2 p.m. on December 3, 2014 following emergency breach of the slough mouth.

An emergency authorization was obtained and the slough mouth was breached between 6 and 7 p.m. on December 2, alleviating flood risk as shown in Photo 6. Without implementation of a reasonable management strategy, a similar pattern of elevated water levels posing imminent flood risks and unsafe conditions at the airport is anticipated to continue.

2.2 WILDLIFE HAZARDS

Wildlife hazards have been a guiding force in planning efforts at the Santa Barbara Airport, and Goleta Slough in particular, for many years. Numerous wildlife species at airports pose a hazard to aircraft, but the principal species involved in wildlife hazards vary considerably by region and specific location. In 2007, the Federal Aviation Administration (FAA) issued AC 150/5200-33B, an advisory circular describing *Hazardous Wildlife Attractants on or Near Airports* (Federal Aviation Administration 2007). This advisory circular included a ranking and relative hazard score for species groups occurring at airports in the United States, based on data from FAA's National Wildlife Strike Database, January 1990-April 2003. Many of the species and groups listed in AC 150/5200-33B occur at the Santa Barbara Airport: vultures, geese, cormorants/pelicans, ducks, herons, hawks, gulls, coyotes, and others.

A number of habitat factors at Goleta Slough and other open areas within the airport may influence the level of wildlife hazard. The major high-hazard wildlife species affected by water levels and the extent of inundated areas are birds. Generally speaking, pooling or standing water can attract many bird species that are hazardous to aircraft. Seasonal pooling around the Santa Barbara Airport, including parts of Goleta Slough such as Basins K and L/M, may attract many water-dependent bird species. Diving ducks (*Aythya* spp., etc.) and double-crested cormorants (*Phalacrocorax auritus*) are attracted to the deeper waters that form in these areas. Shallower pools may attract dabbling ducks such as mallards (*Anas platyrhynchos*) and northern shoveler (*Anas clypeata*), as well as herons and egrets, including great blue herons (*Ardea herodias*) and great egrets (*Ardea alba*). When waters recede, very shallow water and mudflats may attract a variety of sandpipers, plovers, and other shorebirds such as black-necked stilts (*Himantopus mexicanus*). In areas influenced by tidal circulation, any of the above species occur in moderate levels, although the concentrations of high-hazard bird species is thought to remain

at a consistent level throughout the year, as long as those areas remain tidal. While water levels at times are very high in tidal areas, such conditions last only a few hours, before WSE falls again. Thus habitat conditions similar to those in areas where seasonal pooling occurs do not last long enough to sustain birds requiring more consistent, higher water levels.

Following cessation of sandbar management in 2012, WSE in Goleta Slough rose to a high of approximately 6.8 feet above mean sea level (msl), before beginning to drop gradually. Large numbers of water-dependent birds were attracted to many of the inundated areas.

To assess increases in bird activity, Dudek conducted a bird survey in April 2013, when the mouth of the slough and WSE was at approximately 6.7 feet above msl (Dudek 2013). Results were compared with avian data collected in Goleta Slough for several projects from 2001 through 2008, prior to cessation of slough mouth management in 2012. The previous data included 118 avian surveys with similar census methods conducted as part of baseline date collection and monitoring for the Tidal Restoration Demonstration Project. The 118 surveys were conducted at various times of years, so surveys from dates similar to the early April timeframe for the 2013 survey were selected for comparison. Although the previous surveys did not follow established protocols for assessing wildlife hazards, comparison of 2013 survey data with records for similar time of year surveys provides some useful information regarding changes in avian use and abundance in the slough.

The 2013 survey counted 1,037 birds from 33 different species in inundated slough basins, of which 77.7 percent were of species rated as moderate to high risk to aircraft (ducks, geese, cormorants, herons, and egrets). Additionally 463 birds from 16 species were detected flying over but not landing in basins. These birds were primarily swallows, but included 40 gulls, which are higher-hazard species. Counts of waterfowl were 39 times higher than average of previous surveys for the same time of year. Counts of egrets and herons were more than 10 times previous average. Waterfowl species counted in basins in 2013 greatly exceeded previous average waterfowl counts, and in many cases exceeded previous highs for a single survey regardless of time of year (Dudek 2013).

Additional surveys were conducted in May 2013, to monitor bird activity while the County conducted siphoning at the slough mouth to reduce WSE in the slough. In 2014, Dudek conducted surveys to gather additional information on the potential effects of a closed slough mouth on wildlife hazards. In 2014, weekly surveys were conducted of Basins A/H, B/C, D, E/F, G, K, and L/M during a portion of the spring 2014 and the fall 2014 (Rincon et al. 2015). Because of the emergency opening of the slough mouth on February 28, 2014, the slough remained tidal during spring surveys. Non-tidal Basin K was inundated for the entire spring survey period, while non-tidal Basin L/M supported scattered pools of water. During fall surveys, the mouth was closed, and WSEs in areas that are tidal during open mouth conditions remained between approximately 3.8 and 4.1 feet (below mean higher high tide) for nearly the entire period. The final survey was conducted after the rain event of October 31-November 1, 2014, when WSE was approximately 5.3. Survey methods were the same as in April 2013. Data analysis combined all previous data collected using similar methods and compared bird totals for open- and closed-mouth conditions for different times of year. As most data was collected under open-mouth conditions or when WSE was below 4.5 feet above msl, analysis focused on the few times of year when data were available for periods of sustained high WSE (more than

5.0 above msl): April, May, and November. For all surveys conducted during periods of sustained high WSE, the numbers of high-hazard species (ducks, geese, cormorants, herons and egrets, vultures, raptors, gulls, crows, and swallows) were well above average. Totals for April 2013 and November 2014 were the highest for any survey during similar times of year. The average totals for surveys conducted in May 2013 were well above average. Numbers of water-dependent species included in the analysis (ducks, geese, cormorants, egrets and herons, gulls, and shorebirds) were especially high during these surveys (Rincon et al. 2015).

Analysis of all available data indicates that high-hazard species (particularly water-dependent species) are present in far greater numbers when the slough mouth is closed and the slough is inundated than when the slough mouth was managed. Additionally, failure to manage the slough mouth may affect species composition by permitting the persistence of inundated conditions more suitable for waterfowl, herons and egrets, and other water-dependent species, rather than supporting vegetated marsh suitable for songbirds and other terrestrial species. Increased presence of water-dependent birds in turn increases risk of bird strikes at the Santa Barbara Airport.

2.3 WATER QUALITY, AQUATIC HABITAT, AND VECTORS

The Slough is divided into multiple basins separated by artificial berms. As noted above, previous projects have partially restored tidal flow into the basins when the mouth of the slough is open (URS Corporation 2009b). These projects were implemented when slough mouth management was still regularly occurring and cessation of management has altered hydrology in the basins. When the slough mouth is closed for extended periods, tidal mixing does not occur. Lower dissolved oxygen and stagnation are reported when the slough is closed for extended periods (Padre and Associates 2010). Under the previous management strategy, until 2012, the mouth of the slough was opened any time sand buildup caused a closure lasting more than two weeks. Creation of a channel through the sandbar allowed tidal water to flow in and out of the slough. Without management, when sand closes the slough mouth, the slough can be cut off from tidal influence for extended periods. Changes in frequency of tidal mixing and reduced water movement can alter salinity, temperature, and dissolved oxygen. Water depth is also affected. While inundation can increase total area of aquatic habitat, prolonged inundation can have negative implications for wetlands and terrestrial vegetation as discussed further in Section 2.4. Aquatic habitat suitability values for tidewater goby in Goleta Slough and steelhead in the Slough and upstream have been based on extensive literature review of habitat criteria, USFWS designation of critical habitat, and observations of tidewater goby in Goleta Slough, as discussed further in Sections 4 and 5.

Previous assessments of general water quality in Goleta Slough identified high levels of pathogens, priority organic pollutants, specifically organic chlorine pesticides, and excessive sediment loads (Padre and Associates 2010). The Slough was listed on the 2010 Clean Water Act Section 303(d) list of Water Quality Limited Segments requiring Total Maximum Daily Loads (TMDLs) for pathogens and organic pollutants (State Water Resources Control Board 2010). Tributary creeks to Goleta Slough are also listed for various water quality problems that include chloride, pathogens, *Enterococcus*, *Escherichia coli* (*E. coli*), fecal coliform, low dissolved oxygen, sodium, water temperature, pH, priority organics, electrical conductivity, and nitrate. Note, the

listed reaches of tributary streams include the project area but also extend several miles upstream of the project site.

Table 1. Goleta Slough Tributary 303(d) Listings

Listing Parameter	Waterbody on 2010 303(d) (TMDL required list)?					
	Atascadero Creek	Glen Annie Canyon (Tecolito in part)	Los Carneros Creek	San Jose Creek	San Pedro Creek	Goleta Slough
Chloride	x	x		x		
Electrical Conductivity			x	x		
Enterococcus	x	x	x	x	x	
Escherichia coli (E. coli)	x	x	x	x	x	
Fecal coliform	x	x		x	x	
Low dissolved oxygen	x					
Nitrate		x	x			
Pathogens						x
pH	x		x	x	x	
Priority Organics						x
Sodium	x	x			x	
Temperature	x				x	
Unknown toxicity		x				

When the slough mouth remains closed for extended periods, buildup of other pollutants from upstream drainages may occur because flushing and mixing associated with tidal flow does not occur regularly. Evaporation in the summer months can exacerbate this problem.

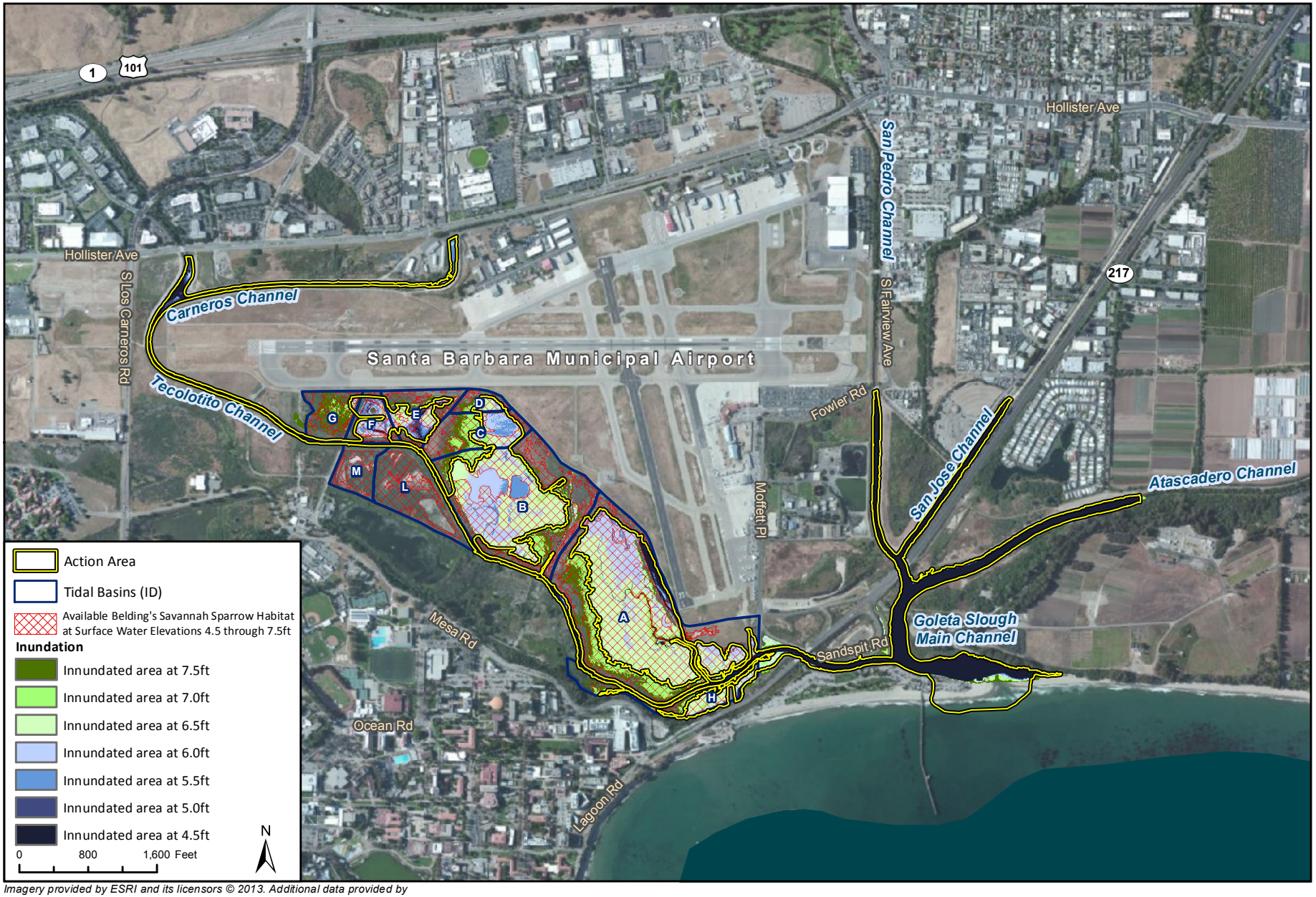
Additionally, the Mosquito and Vector Management District (MVMD) of Santa Barbara County routinely monitors and controls disease-carrying mosquito populations in the County. MVMD has conducted trapping surveys for many years along the edge of airport property adjacent to UCSB. High numbers of female mosquitoes are routinely reported from this trap location in spring and early summer. Under brackish conditions, MVMD reports that black salt marsh mosquito (*Aedes taeniorhynchus*) are typically prevalent in the vicinity of Goleta Slough. This species is reportedly a nuisance due to aggressive day-time biting, but low risk for transmission of mosquito-borne diseases. During periods of high WSE under a closed slough mouth condition, mosquitos that prefer freshwater conditions are able to breed at Goleta Slough. These include vectors of West Nile Virus, *Culex* species. During the spring of 2013, when the slough mouth was closed and water levels were elevated due to late rains, MVMD documented much higher than normal abundance of female mosquitos, predominantly the Encephalitis Mosquito (*Culex tarsalis*), during trapping activities conducted in May, despite multiple applications of larvicide (Mosquito and Vector Management District of Santa Barbara County 2014). Data presented in a summary letter from MVMD illustrates that May 2013 trapping surveys documented nearly ten times the number of mosquitos per trap night seen in the same month at

the same trap location in 2003, 2004, 2005, 2006, 2010, and 2012, and more than four times the number of mosquitos per trap night seen in any other month over those years (Mosquito and Vector Management District of Santa Barbara County 2014).

2.4 TERRESTRIAL HABITAT

The need to reduce effects of high water on terrestrial habitat within Goleta Slough provide an important argument for managing WSE. The terrestrial habitat most affected when WSE is high in Goleta Slough is pickleweed (*Salicornia pacifica*) marsh. Prior to the expiration of the County's permits to manage the sandbar at the slough mouth, most pickleweed marsh within Goleta Slough typically was inundated only during particularly high tides (greater than WSE [WSE] 5.5 feet above msl). This community supported a nesting population of Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), a state endangered species. Other than one or two territories present irregularly at Devereux Slough, approximately 1.25 miles west of Goleta Slough, the population at Goleta Slough is the furthest northwestern occurrence for the subspecies. Periodic surveys (approximately every five years) have yielded counts of between 52 and 68 territories since 2001, although more extensive surveys in 1992 and 1994 recorded 117 and 140 pairs, respectively (Zembal and Hoffman 2010, Compton 2015, Holmgren and Burnell 1992, Holmgren and Kisner 1994). In the spring 2013, when the WSE during closed-mouth conditions reached approximately 6.7 feet above msl, a large expanse of pickleweed marsh habitat was underwater in the areas where the highest densities of territories had been observed in previous years. Basin A/H supported at least half of the Belding's territories reported during surveys in 2001, 2006, and 2015, at 39 territories (57%), 26 territories (50%), and 29 territories (56%) respectively (D. Compton, personal field notes; Compton 2015; totals by area were not available for the 2010 survey). While water in this area is generally limited to non-vegetated areas when WSE is at or below 4.5 feet above msl (Figure 3; Photo 7), pickleweed marsh in the basin was mostly inundated at 6.7 feet above msl in April 2013, during the Belding's savannah sparrow nesting season (Photo 8). No data is available suggesting the impacts of inundation on nesting by Belding's savannah sparrows during the 2013 breeding season. However, the area that has otherwise supported the bulk of the population was mostly unavailable for nesting during much of this period.

Slough-wide, significantly smaller areas where territorial activities by Belding's savannah sparrow have been observed are available for nesting sparrows as waters rise. LiDAR topographic data overlain with available vegetation data for Goleta Slough (as shown in Dudek 2012) show a moderate decrease in available nesting habitat in these areas when WSE increases from 4.5 and 5.5 feet above msl, and a dramatic increase as WSE exceeds 5.5 feet above msl (Table 2). Areas included in Table 2 are those subdivisions of Goleta Slough (Basins A/H, B/C, D, E/F, G, and L/M) where Belding's savannah sparrows have regularly been recorded, and where suitable vegetation communities occur: those dominated by pickleweed, alkali heath (*Frankenia salina*), and saltgrass (*Distichlis spicata*). Additional analysis of the potential effects of inundation on Belding's savannah sparrow habitat is provided in Rincon et al. (2015).



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Belding's Savannah Sparrow Habitat and Water Surface Elevation

Figure 3

Photo 7. Basin A on December 3, 2014, during open mouth conditions, WSE at approximately 4.5 feet, after the slough mouth was breached due to emergency conditions. This location and Basin B/C supported the highest densities of Belding's savannah sparrow territories prior to 2012, as well as in 2015, when closure of the slough mouth did not result in water levels high enough to inundate these areas.

Photo 8. Basin A at approximately 6.7 feet WSE (NAVD88), April 7, 2013.

Table 2. Available Belding's Savannah Sparrow Habitat, by WSE

Water Surface Elev. (feet above msl)	Inundated Habitat	Available Habitat (acres)	Available Habitat (percent of total)
4.5	1.44	153.30	99.1
5.0	4.50	150.25	97.1
5.5	12.06	142.68	92.2
6.0	34.39	120.36	77.8
6.5	82.10	72.64	46.9
7.0	106.67	48.08	31.1
7.5	121.80	32.94	21.3
8.5	141.36	13.38	8.6

Additionally, brackish marshes associated with Goleta Slough also provide suitable habitat for several special status plants, including estuary seablite (*Suaeda esteroa*) and southern tarplant (*Centromadia parryi* ssp. *australis*) (Rincon et al. 2015). These species are not currently listed as threatened or endangered under the State or Federal Endangered Species Acts, but are ranked California Rare Plant Rank 1B, a status reserved for species imperiled in California. These species do not tolerate prolonged inundation, and ongoing inundation of brackish marshes at Goleta Slough would threaten known occurrences and limit suitability of habitat there.

2.5 PURPOSE OF THE PROPOSED PROJECT

The proposed Project would implement measures to manage sand buildup at the slough mouth to minimize closures that create flood risks during storms, restore tidal flow into the slough during winter months, reduce risks of mosquito breeding, maintain aquatic and terrestrial species' habitat needs, and balance habitat needs of special status species that rely on the slough with human health and safety needs on surrounding uplands. The Project has identified multiple management tools to address a range of possible slough mouth conditions. These management actions would minimize wildlife hazards at the airport, reduce mosquito breeding risks, and alleviate flood risk and water quality problems such as stagnation that reduce aquatic habitat quality.

3.0 DESCRIPTION OF THE PROPOSED ACTION

The City of Santa Barbara proposes to implement the Goleta Slough Mouth Management Project by implementing maintenance strategies when the mouth of Goleta Slough becomes blocked by sand buildup at the beach. If the project is not implemented, the slough mouth would be opened only by natural events such as flood flows during the rainy season. Maintenance options have been developed using site-specific water quality, WSE, and habitat model data. The active management alternative would include mechanical breach and siphon/pumping when specific conditions are met as described below.

3.1 MECHANICAL BREACH

Mechanical breach of the slough mouth would follow an explicit process. Conditions, including WSE in the slough, weather forecasts, and wildlife conditions, will be closely monitored year-round. Based on an analysis balancing the objectives of maximizing habitat for aquatic and terrestrial species and minimizing risk to wildlife (Section 2.5), when WSEs in the slough reach 5.5 feet, the City will initiate a review of data, and prepare for a potential breach. If rain is predicted that would be sufficient to raise water level in the slough by more than one foot, the City will prepare for action. Based on past precipitation and WSE data, this generally equates to one inch of rainfall as measured at the airport equaling a 1.0 foot rise in WSE within the slough. If WSE rises to 6.5 feet or greater between October 15 and March 30, the berm would be breached using a backhoe to remove sand from the berm. Sand removal would be one bucket-load wide (approximately four [4] feet), and deep enough to breach the berm (total depth dependent on height of berm at time of breach). Sand removed from the berm would be spread on the adjacent beach. Breaching would occur at high tide when possible; although the slough mouth would likely close more rapidly compared to breaches at lower tide, immediate hazards would be alleviated and concerns about prolonged open-mouth conditions extending through spring and summer would be lessened. A table presenting parameters to determine when breaching is warranted is presented below.

Table 3. Summary of Conditions Indicating a Possible Berm Breach

Water Elevation Surface (WSE) (feet)	Predicted Rainfall Quantity (inches)	Expected WSE Increase (feet)	Expected Wildlife Hazard Increase	Observed Wildlife Hazard Increase	Flood Risk	Breach?
5.5	1.0	1.0	**Yes**	No	No	No
5.5	1.0	1.0	**Yes**	**Yes**	No	**Yes**
6.0	1.0	1.0	**Yes**	No	No	No
6.0	1.0	1.0	**Yes**	**Yes**	No	**Yes**
6.5	1.0	1.0	**Yes**	No	**Yes**	**Yes**
6.5	1.0	1.0	**Yes**	**Yes**	**Yes**	**Yes**
7.0	1.0	1.0	**Yes**	No	**Yes**	**Yes**
7.0	1.0	1.0	**Yes**	**Yes**	**Yes**	**Yes**

Breaching would be conducted in a manner that mimics natural breaching of the slough to the extent feasible. The preferred timing for mechanical breaching of the berm would be in the late fall and/or winter months. Preferred timing would be near high tide, to reduce the differential between the slough and ocean WSEs, which will manage the water velocity through the open bar. This will minimize scour, turbidity, stranding risk, displacement of tidewater gobies, and associated lowering of overall water quality. Winter breach would open the slough mouth for fish passage into the slough and lower creek channels in years when the mouth does not open naturally during fall storms, and would have less effect on dry season rearing habitat in the estuary. For each breach event, the City would track WSE before and after, how much material was moved, the tidal conditions at the time of breach and during approximately 12 hours after the breach, and how long the slough mouth stays open following breach. This information would be used to further refine slough mouth management to optimize breach times and best mimic natural conditions while addressing health and safety concerns.

Importantly, if all criteria to warrant a mechanical breach are not met, the sandbar would not be breached; in some dry years, water heights and wildlife hazards may never reach concerning levels. Although low dissolved oxygen events can occur when the slough mouth is closed, this factor alone may not trigger sandbar breaching as some low dissolved oxygen events are naturally occurring and the intent of the program is to mimic natural processes as much as possible.

3.2 SIPHONING/PUMPING

This maintenance action would consist of siphoning or pumping water from the slough and discharging the siphoned or pumped water to the Pacific Ocean on the far side of the sandbar blocking the slough mouth. Water levels within the slough would be lowered using a pump and/or siphon system at a slow rate, approximately 1.5 to 2 inches per day. The gradual change in WSE would allow fish to move to areas of suitable habitat, avoid or minimize stranding risk, and reduce water pressure on the slough mouth sandbar.

A table presenting parameters to determine when siphoning/pumping is warranted is presented below.

Table 4. Summary of Conditions Indicating Possible Siphoning/Pumping.

WSE (feet)	Expected Wildlife Hazard Increase	Observed Wildlife Hazard Increase	Flood Risk	Siphon/ Pump?
5.5	Yes	No	No	No
5.5	Yes	Yes	No	**Yes**
6.0	Yes	No	No	No
6.0	Yes	Yes	No	**Yes**
6.5	Yes	No	Yes	**Yes**
6.5	Yes	Yes	Yes	**Yes**
7.0	Yes	No	Yes	**Yes**
7.0	Yes	Yes	Yes	**Yes**

Siphoning/pumping is not feasible for implementation during fall and winter high-water situations due to the slow rate at which water levels are reduced. This alternative was rejected for use in fall and winter because storm events can cause WSE in the slough to rise rapidly, and reducing water levels by 1.5 to 2 inches per day would not alleviate risk of flooding quickly enough to serve the purpose and need of the Proposed Action.

When siphoning/pumping are used, equipment would be set up with a three-tier exclusion area surrounding the water intake. Three-tier exclusion would consist of mesh nets, designed with a float line on the top and lead line on the bottom. Typically, floats at the top would be spaced 12 inches apart, and lead barrels at the bottom would be spaced 6 inches apart. The mesh sizes would likely include a 1/16-inch mesh net installed approximately 4 feet from the pipe intake (if fry or young fish are present), a middle net 1/8 inch mesh size, and an outer net of 1/4-inch mesh size, installed 5 feet apart. Biological monitoring would include maintaining the siphon exclusion, relocating trapped gobies, and continuously monitoring dewatering areas to avoid strandings. The exact parameters of mesh exclusion would be adjusted as needed in the field to maintain an effective exclusion zone.

Piping would run approximately 250 feet from the intake area at Goleta Slough to the discharge point below the mean high tide line at the Pacific Ocean. Portions of the pipe may be buried under beach sand to prevent blocking pedestrian and vehicle access; this activity would not be conducted in a manner that results in breach of the sandbar. Previous siphoning efforts at Goleta Slough utilizing 12-inch pipe resulted in identification of plugging problems at the outfall, resulting in cessation of the siphon during overnight high tides. To avoid this problem, pumping may be utilized, and larger pipes 18- to 24-inches in diameter may be used for siphoning/pumping at Goleta Slough. Hours of pump operation would be restricted to daylight hours to minimize noise impacts.

If wave action causes the discharge end of the pipe to become dislodged, resulting in scour around the pipe outlet, the City will use equipment to create a mound on which the pipe end will rest during low tide. This mound would require periodic maintenance during siphoning/pumping operations.

4.0 ACTION AREA

Project activities would occur on Goleta Beach and at the mouth of Goleta Slough. Management actions taken at the slough mouth and/or along the beach would, in turn, have effects on the slough and the lower reaches of five tributary watersheds: Atascadero, San Pedro, San Jose, Los Carneros, and Tecolotito Creeks. Therefore, the Action Area includes the location of project activities and the area potentially influenced by the waters of the slough and these five creeks, or tidal areas within the slough and the upper limit of tidal influence in each tributary, and areas potentially inundated under flood conditions up to 8.5 feet of WSE, as well as staging and access locations for proposed management activities at the mouth of the slough (Figure 2). Flood conditions above 8.5 feet would create unsafe conditions at the airport; flood water levels above this WSE are not expected to occur except in extreme circumstances because emergency actions to maintain airport safety would typically be implemented long before water exceeds 8.5 feet.

4.1 LOCATION OF GOLETA SLOUGH

The Project is in the City of Santa Barbara, Santa Barbara County, California, within the Santa Barbara Airport annexation parcel, adjacent to the Goleta City limit, and extends into unincorporated Santa Barbara County near Atascadero and San Pedro Creeks. The site includes the airport, the Goleta Slough and its surrounding wetland, riparian, and beach habitats (Figure 1), and Goleta Beach County Park. The Project Site is within the *Goleta, California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle. Topography is flat to very gently sloped, and the project site generally has low relief (USGS 2014a). Site-specific elevation data document that land elevations for the majority of the Project study area are less 12 feet above msl. The greatest elevation is on the Mescalitan Island remnant mesa south of the airport.

Goleta Slough receives water from five major streams. Atascadero, San Pedro, and San Jose Creeks meet near the mouth of the slough on the east side. Los Carneros and Tecolotito Creeks meet upstream to the west. The San Pedro Creek watershed (Hydrologic Unit Code [HUC] 180600130202) includes San Pedro, San Jose, Los Carneros, and Tecolotito Creeks and their tributaries, and drains approximately 27.6 square miles, while the Atascadero Creek watershed (HUC 180600130201) includes Atascadero Creek and its tributaries, and drains approximately 19.8 square miles. Combined watersheds of these creeks drain over 47.4 square miles according to the Nation Hydrography Dataset (NHD; U.S. Geological Survey 2014b). The lower reaches of all these creeks have had regular previous management actions, including silt removal projects, and structures such as check dams, concrete lining, and sediment basins are present. Tecolito and Los Carneros Creeks had channel realignment projects implemented in 2006 (URS Corporation 2008e; Padre and Associates 2010).

Because management actions taken at the mouth of the slough and/or along the beach would have direct effects on the slough and tributary watersheds, the lower reaches of these creeks are included within the Action Area (Figure 2). The project site extends approximately to the upper limit of tidal influence in each tributary. Nearby landmarks include Firestone Road and Hollister Avenue to the north, S. Los Carneros Road to the west, Mesa Road to the southwest, Rancho Goleta Mobile Homes and the Southern California Gas property to the east, and the Pacific Ocean along Goleta Beach.

4.2 EXISTING ENVIRONMENT

4.2.1 Surface Hydrology and Water Quality

Hydrology in Goleta Slough is influenced by tidal circulation under open versus closed-mouth conditions and by flow from the five creeks and their tributaries. The five creeks and their tributaries originate in the Santa Ynez Mountains, only a few miles from Goleta Slough, and drain small, steep watersheds as they pass through the foothills and coastal plains (Padre and Associates 2010). Due to the seasonal nature of rainfall in the region, flow from these creeks demonstrates a high degree of variability (Padre and Associates 2010). The creeks pass through undeveloped, mountainous terrain in the Los Padres National Forest, through agricultural lands, and through residential and commercial development, before arriving in Goleta Slough. Although the creeks convey large amounts of sediment into Goleta Slough, sediment basins at the upper edge of tidal influence on the creeks trap much of the sediment conveyed by these streams.

Tidal barriers along the creek occur at Hollister Avenue on Tecolotito, Firestone Road on Los Carneros Creek, to approximately Matthews Street in San Pedro Creek, to about the end of Kellogg on San Jose Creek, and to the check structure near the end of Ward Drive on Atascadero Creek (Figure 2; Padre and Associates 2010).

As discussed in Section 2.3, water quality within the Action Area varies seasonally and depending on whether the mouth of the slough is open or closed. Water temperatures and salinity are higher during the summer than in winter. Lower dissolved oxygen occurs when the slough mouth is closed during extended periods. Several known pollutants occur within Goleta Slough, the primary concerns being pathogens, priority organics (specifically, organic chlorine pesticides), and sediments. Because of problems related to these pollutants, the Central Coast Regional Water Quality Control Board (RWQCB) currently lists Goleta Slough as an impaired water body under the Clean Water Act Section 303(d) (State Water Resources Control Board 2010). Metals were formerly considered a problem as well, but were removed from the listing (Padre and Associates 2010, Leydecker n.d.). Pollutants and sediments can be conveyed into the slough from varied sources within any of the five creeks.

Stormwater runoff affects water quality within Goleta Slough in several ways. Runoff from storm sewers contributes to the presence of the pollutants described above that account for the Goleta Slough's listing as an impaired water body. High bacteria concentrations in the surf zone in the area have most often been associated with runoff during storm events (Padre and Associates 2010). Stormwater runoff can also contribute to rapid rise in WSEs in the slough during and immediately following storm events, particularly when the slough mouth is closed, as noted in Section 3.

Treated wastewater from the Goleta Sanitary District (GSD) plant on Moffett Place, immediately east of the Santa Barbara Airport, is discharged into the Pacific Ocean southwest of Goleta Pier, approximately one mile offshore. GSD completed an upgrade of its facility in September 2013 and is now a full secondary treatment plant (Goleta Sanitary District 2015). Although the GSD facility is within the Slough watershed, because it discharges directly to the Pacific Ocean, it is not a major contributor of water into the Slough system and is not expected to be a source of

nutrients, particulates, or pollutants, nor would it contribute to excessive water heights when the slough mouth is closed.

4.2.2 Water Surface Elevation

The range of variation in WSE within Goleta Slough is reliant upon whether the mouth of the slough is open or closed. According to data from a County-maintained gauge on Tecolotito Creek in the lower part of the slough, during open mouth conditions since November 2006, WSE has ranged between approximately –0.6 feet and 7.2 feet above msl (NAVD88; Santa Barbara County n.d.). However, during long periods, WSE never rises above 7.0 or drops below 0.5 feet above msl. The mean higher high water (MHHW), or the average of all higher high waters (the higher of the two high water levels during a tidal day), is approximately 5.2 feet in the Santa Barbara region. This means that, when the slough mouth is open, WSE regularly does not exceed 5.2 feet above msl (URS Corporation 2003).

Fewer data are available for when the slough mouth is closed for long periods. The mouth remained closed from late 2012 through much of 2013. Although water never exceeded levels of the higher tides in the region, WSE was relatively constant, never dropping below 6.0 above msl (NAVD88) from March 23 to May 7, by which time emergency siphoning had begun in response to an elevate bird air strike hazard. During February and December 2014, under closed mouth conditions, WSEs reach 8.8 and 7.29 feet above msl at the Goleta Slough stream stage station, respectively, before emergency permits were granted to unblock the mouth to avert flooding in the area (Santa Barbara County n.d.).

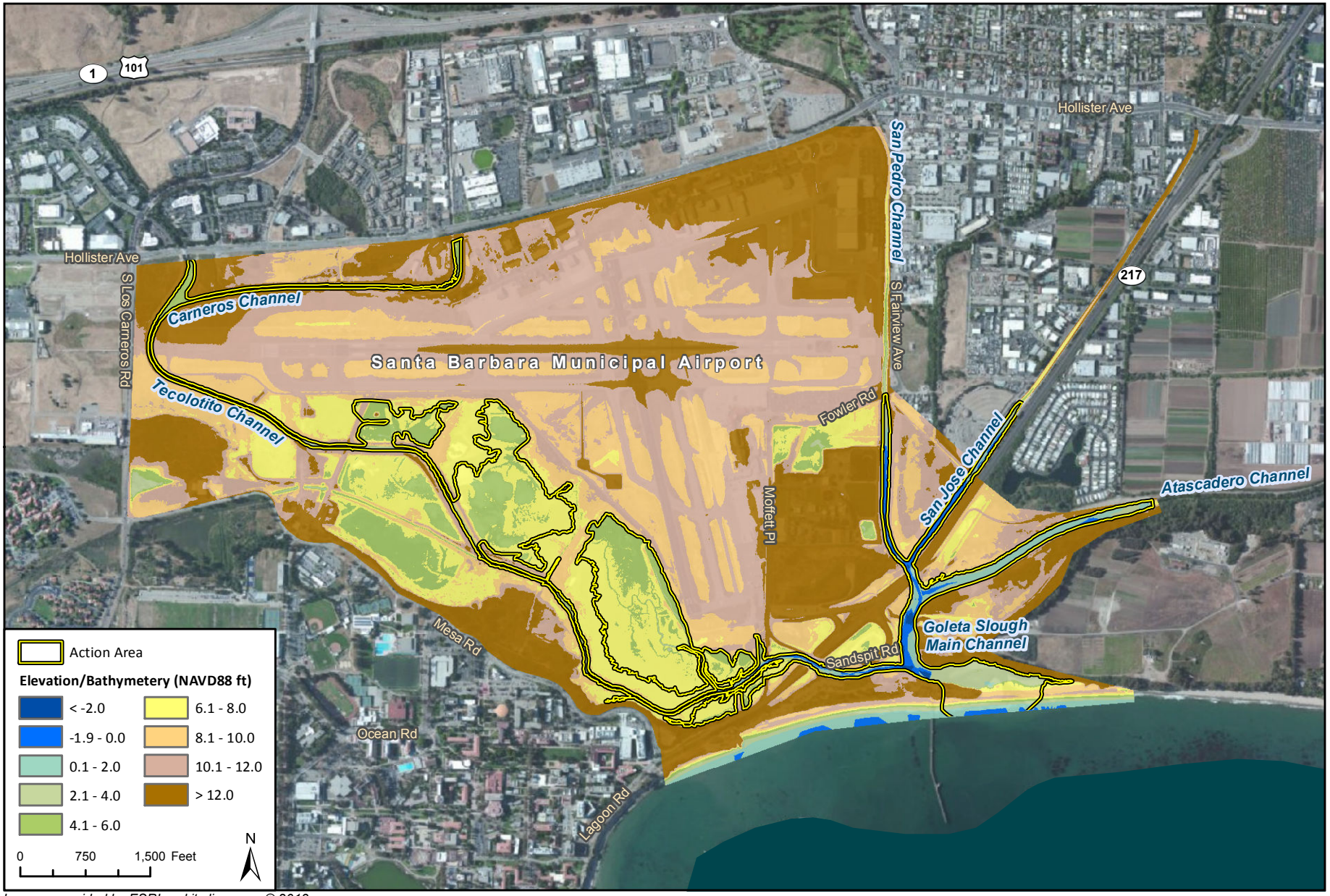
Figure 4 provides elevation and bathymetry data for the Action Area and vicinity, and demonstrates how much area would be inundated at progressively higher WSEs. Note that some areas west of Tecolotito Creek are not inundated even when WSE exceeds land elevation due to presence of protective berms and tide gates. These areas were not included in the Action Area.

4.2.3 Groundwater

Goleta Slough is underlain by the Goleta Groundwater Basin, which extends from west of Ellwood Canyon east to the Modoc Fault and is bounded on the south by the More Ranch fault, which protects the basin from saltwater intrusion. Natural recharge of the basin occurs from "precipitation, seepage from streams, and subsurface inflow from consolidated rocks" (Department of Water Resources 2004). Groundwater in the basin is of calcium bicarbonate in nature. Water high in total dissolved solids occurs in shallow aquifers within the basin.

4.2.4 Geology and Geomorphology

Goleta Slough lies within the western portion of the Transverse Ranges Geomorphic Province of southern California. North-South tectonic compression has resulted in east-west trending faults and folds within the western Transverse Ranges, which include the Santa Ynez Mountains. Goleta Slough is situated within a coastal valley formed by vertical displacement from the Santa Ynez Mountains along the Santa Ynez Fault, and along the More Ranch Fault, which has resulted in uplifting at the mesas of More Mesa, the University of California, Santa Barbara, Isla



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Additional data provided by Dudek 2012: Dudek, Rincon, Bash, and Stillwater 2015, and SWS, 2014.

Topographic Map of Action Area

Figure 4

Vista, and Mescalitan Island. The lower elevations within the slough consist of unconsolidated alluvial deposits (GSMC 1997).

Between 1928 and the 1970s development of the Airport property for aviation resulted in the filling of portions of the slough to accommodate runways, conversion of grassland to accommodate an airport terminal, the establishment of flood control channels within the slough, and the diking of portions of the slough to form basins that gradually became cutoff from tidal circulation (Goleta Slough Management Committee 1997, City of Santa Barbara 2004). During a wetland inventory conducted in 2012 (Dudek 2012b), multiple soil pits exhibited evidence of disturbed soils.

Based on review of the South Coast Santa Barbara County Soil Survey spatial data (USDA-NCRS 2014a), the primary soils on the Airport property include Aquents, Aquepts, Baywood loamy sand, beaches, Camarillo fine sandy loam, Goleta loam, Milpitas-Positas fine sandy loam, and Xerorthents. However, as noted above, substantial alteration of these soils has occurred and existing conditions are not always consistent with mapped types.

4.2.5 Suitable Fish Habitat and Fish Community Description

Goleta Slough generally contains a large amount of physical habitat for tidewater goby and steelhead, in terms of suitable water depths. Substrate suitable for tidewater goby spawning occurs in a few locations in the slough, notably along the sand berm, in the upper sections of the Atascadero and San Pedro Channels, and at the confluence of the Tecolotito and Carneros channels, which may be the only locations where spawning could potentially occur. Locations with suitable spawning substrate typically occur in the vicinity of previously documented tidewater goby observations with the exception of the San Pedro Channel where no observations of tidewater goby are documented, and near the mouth of the slough where previous surveys did not sample. As WSEs increase, especially over about 4.5 feet, emergent and brackish vegetation becomes inundated, and the quality of rearing habitat for both species increases. Under tidal open bar conditions inundated high quality rearing habitat is available on a daily basis, whereas when the bar is closed it can take months before enough freshwater water fills the slough that vegetated habitat is inundated.

Since physical habitat suitable for rearing is abundant for both species, periods of unsuitable water quality and temperature may limit habitat suitability for these species. Detailed water quality results for 2014 and the implications for the relationships between water quality and the suitability of habitat for steelhead and tidewater goby are found in the Biological Technical Report (Rincon et al. 2015).

4.2.6 Terrestrial Habitat Types/Vegetation Communities

Vegetation communities in the Action Area are shown in Figure 5. Project activities would occur in an area of sandy beach between Goleta Slough and the Pacific Ocean. Vegetation communities and land covers within the remainder of the Action Area are mostly limited to those occurring at low elevations receiving tidal influence. Below approximately 4.5 feet above msl, depending on the current WSE, land covers consist of a combination of open water, mudflats, and salt flats. Most of the Action Area lies above 4.5 feet above msl. Vegetation in

these areas is dominated by pickleweed, which often occurs in large, uniform expanses at Goleta Slough and is especially dominant immediately above 4.5 feet above msl. Also prevalent in the Action Area are several other herbaceous plants occurring at a slightly higher elevation than pickleweed, including alkali heath and saltgrass. Small amounts of California bulrush (*Schoenoplectus californicus*), and broadleaf cattail (*Typha latifolia*) occur along the banks of Tecolotito and Los Carneros Creeks, in the far northwest section of the Action Area. At the higher elevations within the Action Area, more upland species occur. Native creeping and blue rye grass (*Elymus triticoides*; *E. glaucus*), as well as bromes (*Bromus* spp.) and other non-native grasses, dominate in small patches. Quailbush (*Atriplex lentiformis*) is the most prevalent shrub in the higher elevations, although some coyote brush (*Baccharis pilularis*) and Menzies' golden bush (*Isocoma menziesii*) also occur. Some areas of arroyo willow occur along Tecolotito and Los Carneros Creeks within the Action Area, presumably in areas of minimal saltwater influence.

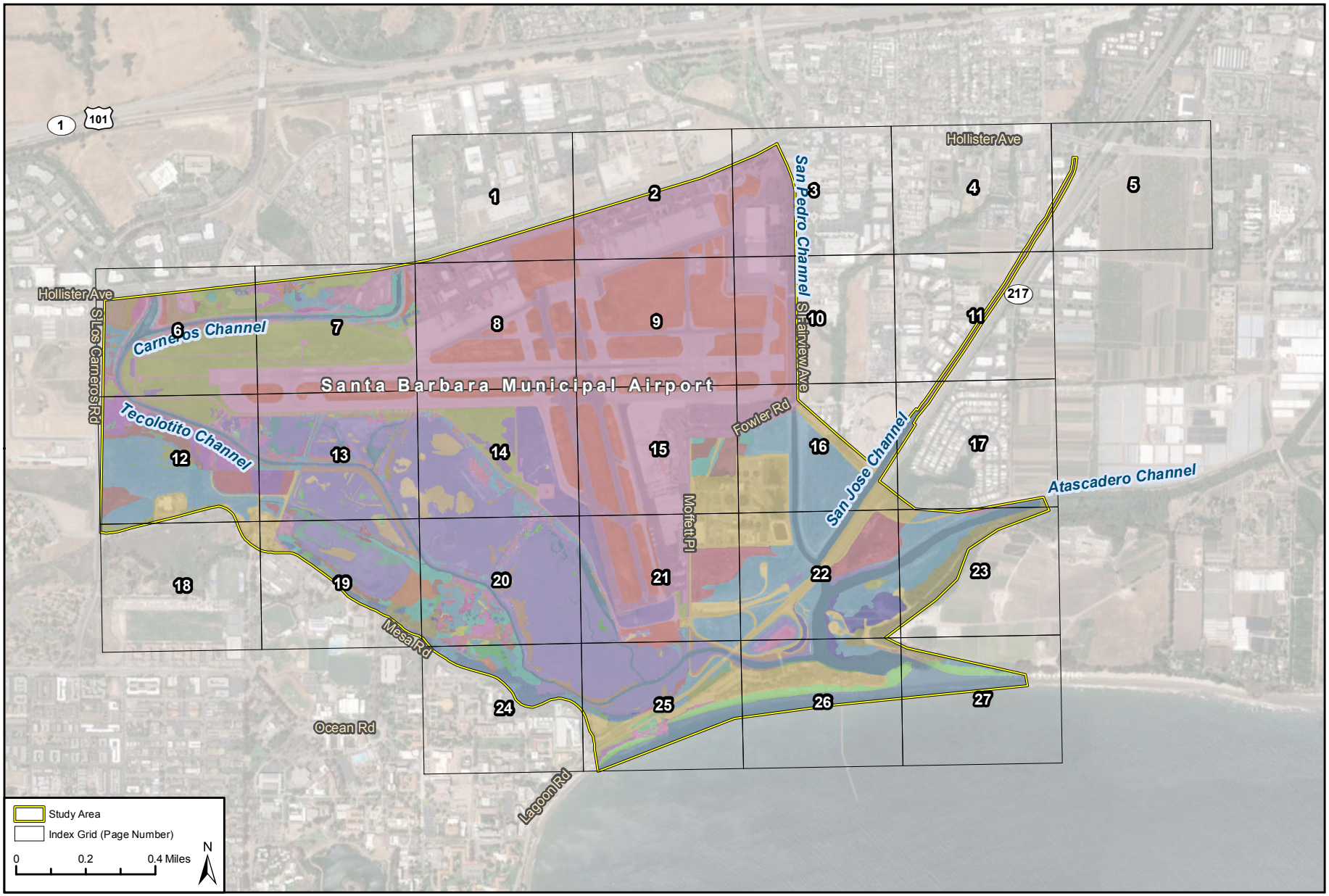
4.2.7 Sensitive Natural Communities/Wetlands and Waters of the U.S.

The primary sensitive natural community occurring in the Action Area is Southern Coastal Salt Marsh. According to Dudek (2012a), this sensitive natural community occurs in Goleta Slough in the form of four vegetation communities: alkali heath marsh, pickleweed mats, salt grass flats, and salt marsh bulrush (Figure 5). These communities, particularly pickleweed mats, provide the primary nesting habitat for the Belding's savannah sparrow, listed as endangered under the California Endangered Species Act (CESA).

Extensive areas potentially under the jurisdiction of the USACE, RWQCB, California Department of Fish and Wildlife (CDFW), and California Coastal Commission (CCC) occur in the Action Area. Prior to expiration of Santa Barbara County Flood Control District permits for managing the slough mouth in late 2012, Dudek (2012b) conducted a wetlands inventory within Santa Barbara Airport property. This inventory did not cover areas outside airport property. In addition, it was not intended as a formal jurisdictional delineation and was not submitted to the agencies as such. However, the inventory provided maps of waters and wetlands within a large part of the Action Area. Table 5 summarizes the acreages for the Action Area, and on Santa Barbara Airport property, potentially within each jurisdiction, based on the 2012 jurisdictional determination. Additional Waters of the U.S. and State, as well as CDFW streambed, occur along the Tecolotito Creek channel east of Santa Barbara Airport property, as well as along Atascadero, San Pedro, and San Jose Creeks. Additional wetlands under the jurisdiction of the USACE and RWQCB also occur here. All of these areas would likely fall under the jurisdiction of CCC.

Table 5. Regulatory Agency and Jurisdictional Category (Acres, Approximate)

USACE Waters of the U.S.	USACE Wetlands	RWQCB Waters of the State	RWQCB State Wetlands	CDFG Streams, Wetlands, & Riparian	CCC Wetland	CCC Riparian
55.1	72.5	127.6	72.5	128.5	127.5	0.7



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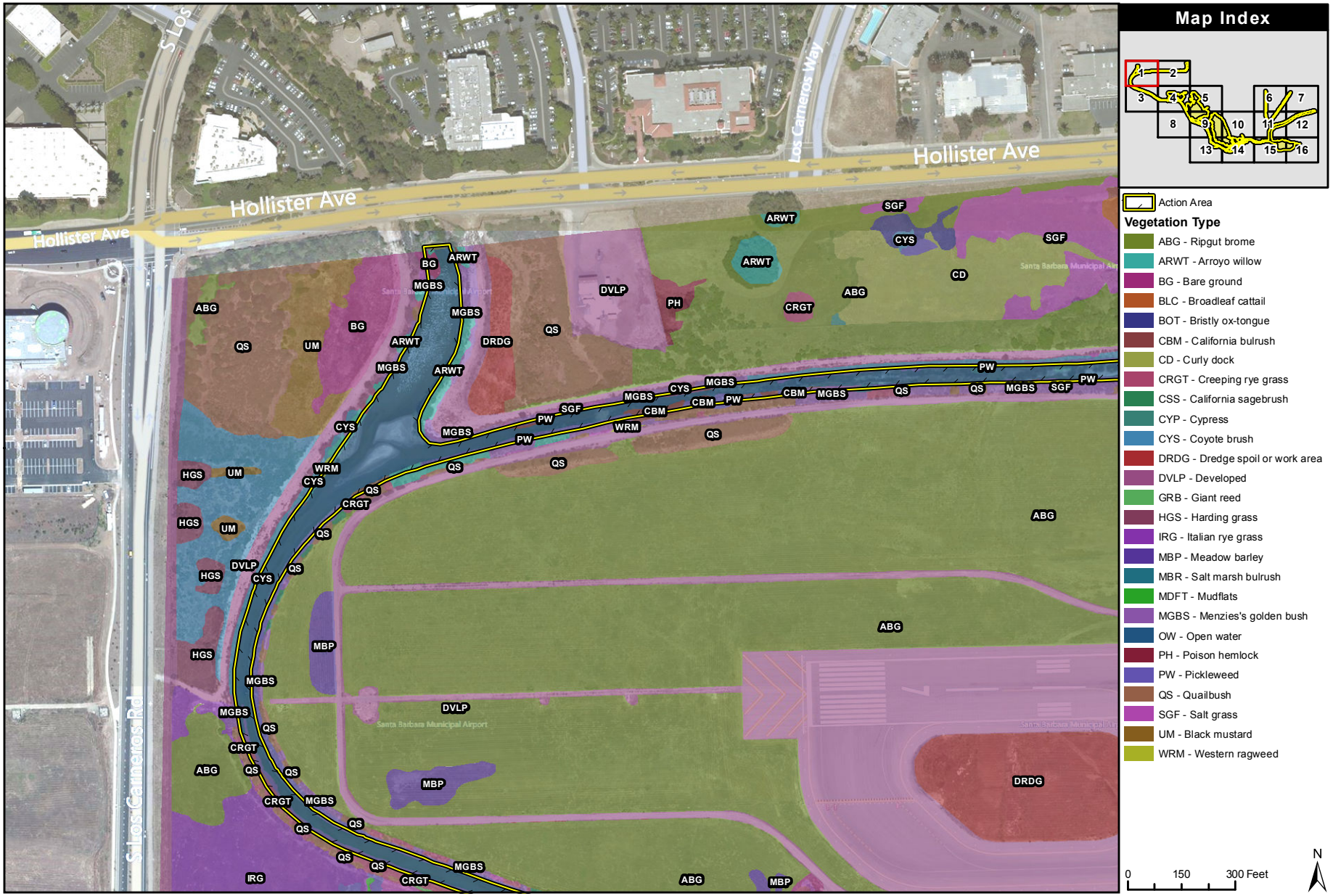
Vegetation Map Index Grid of the Goleta Slough Study Area

Figure 5



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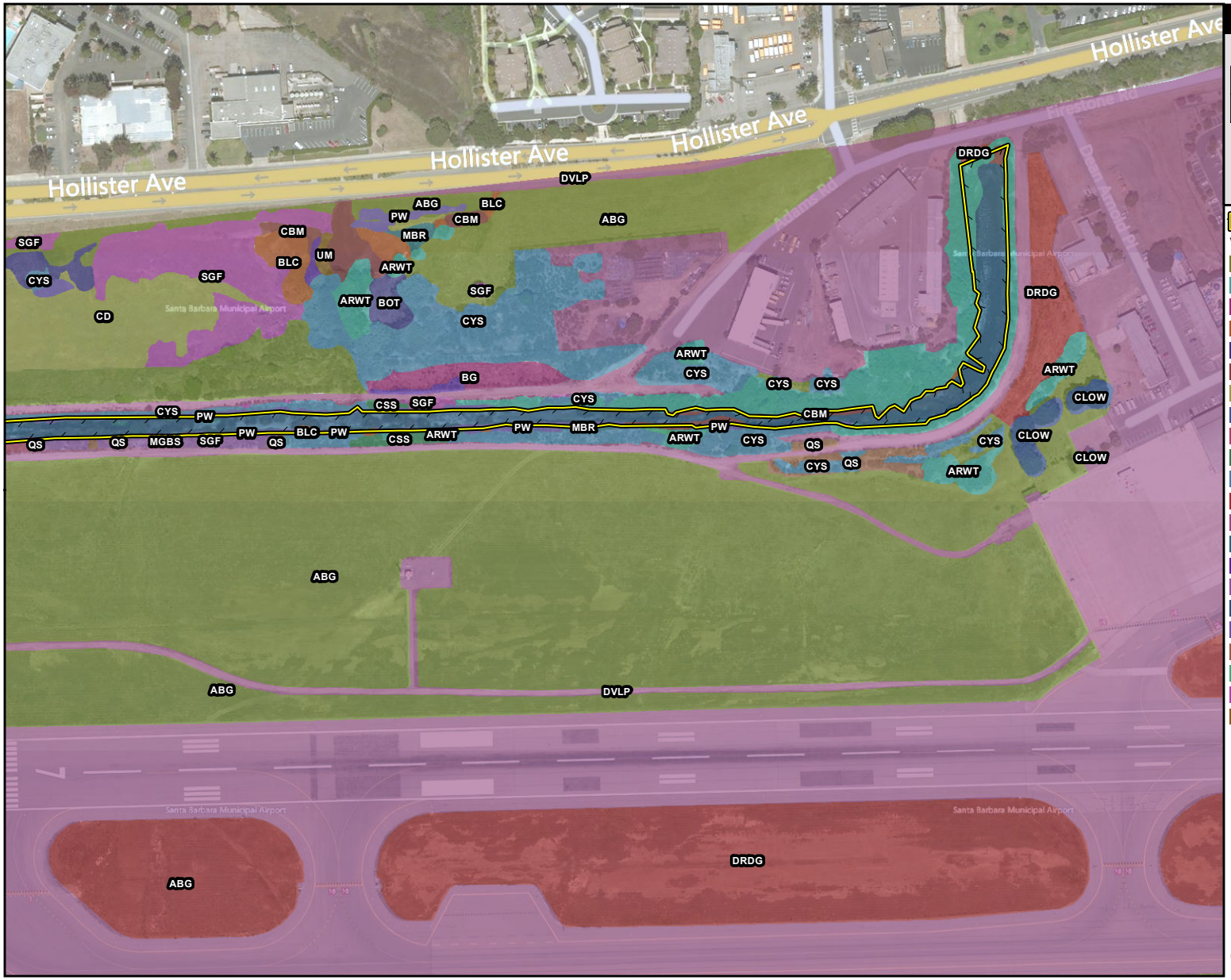
Vegetation Map of the Goleta Slough Study Area

Figure 5.1



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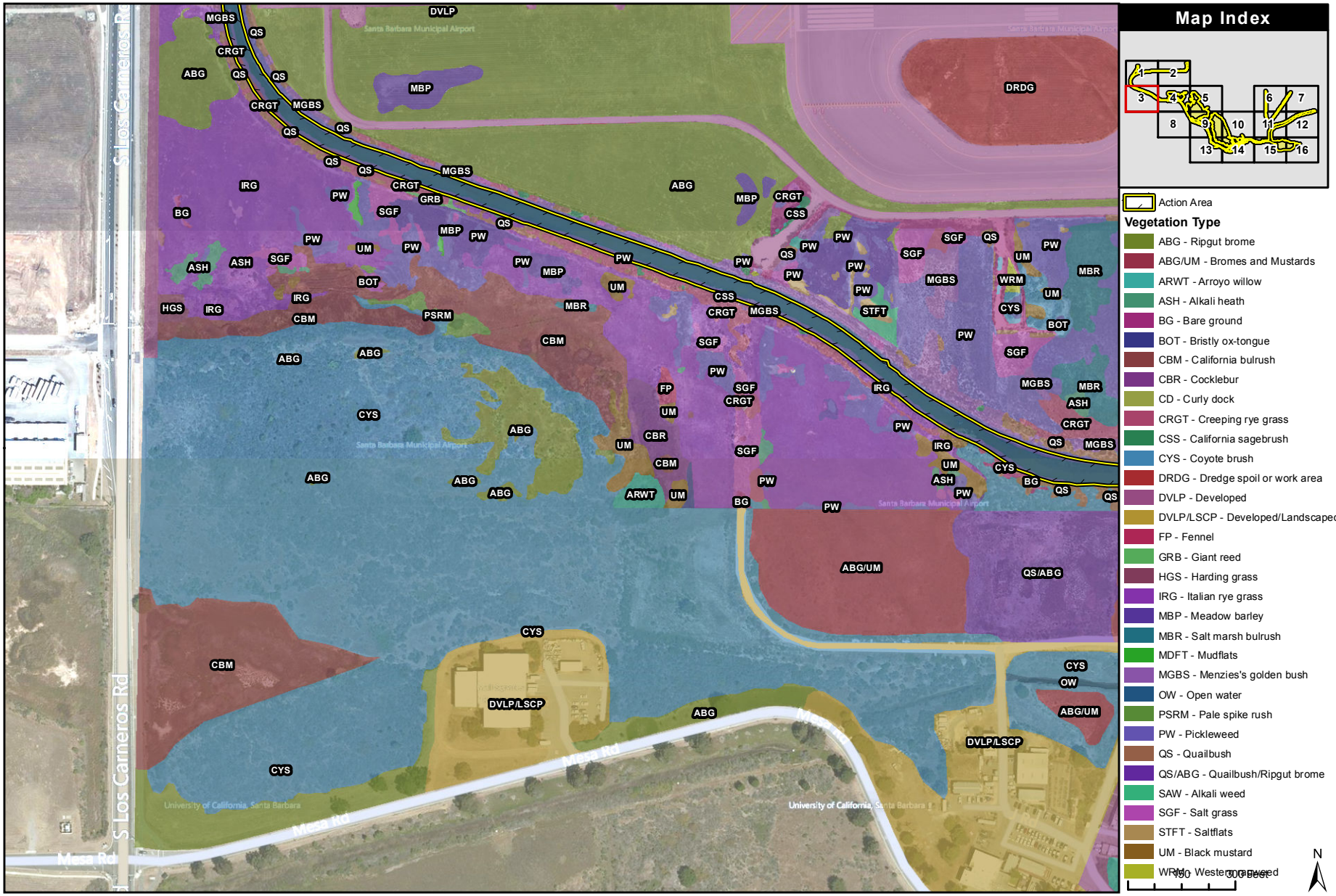
Vegetation Map of the Goleta Slough Study Area

Figure 5.2



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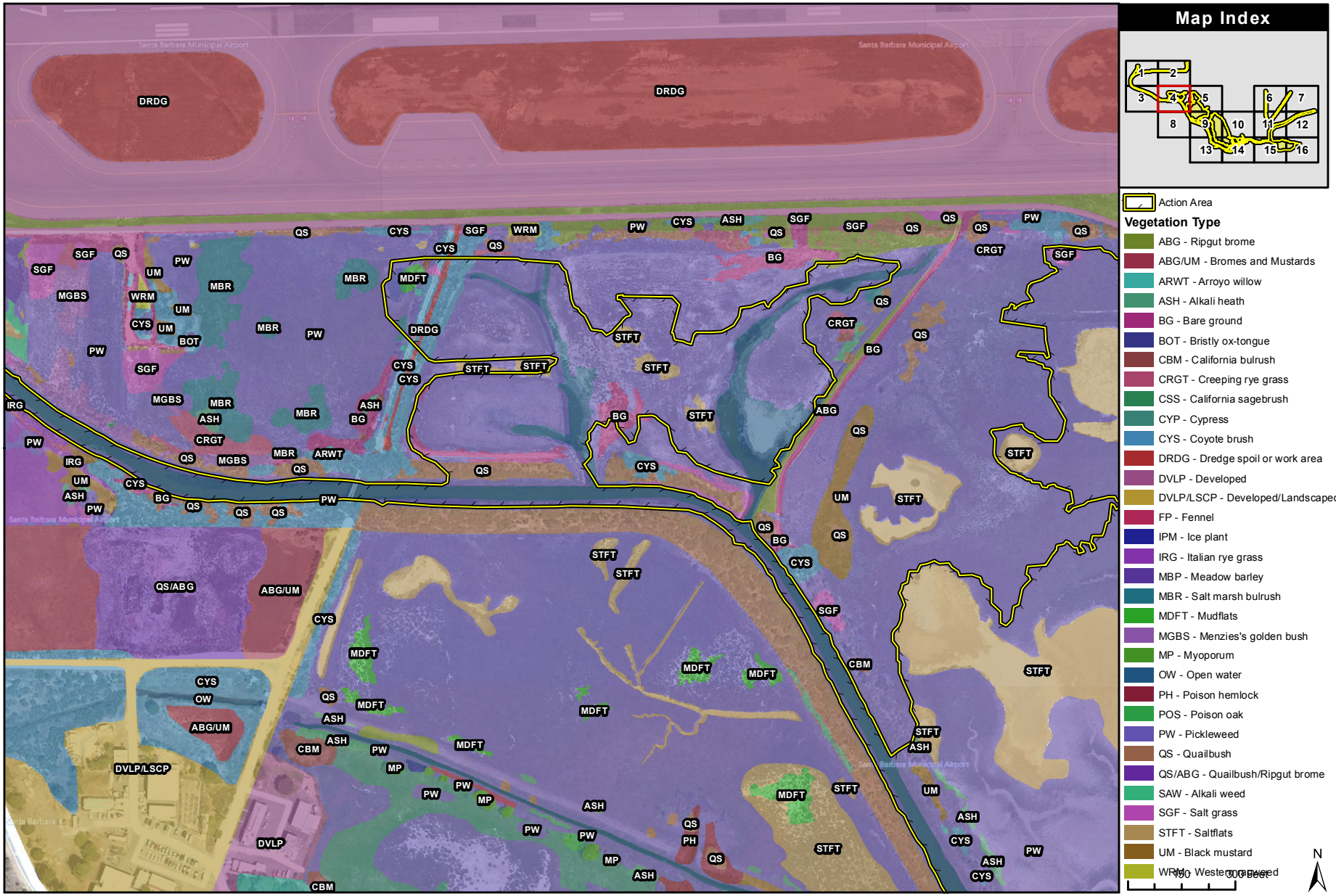
Vegetation Map of the Goleta Slough Study Area

Figure 5.3



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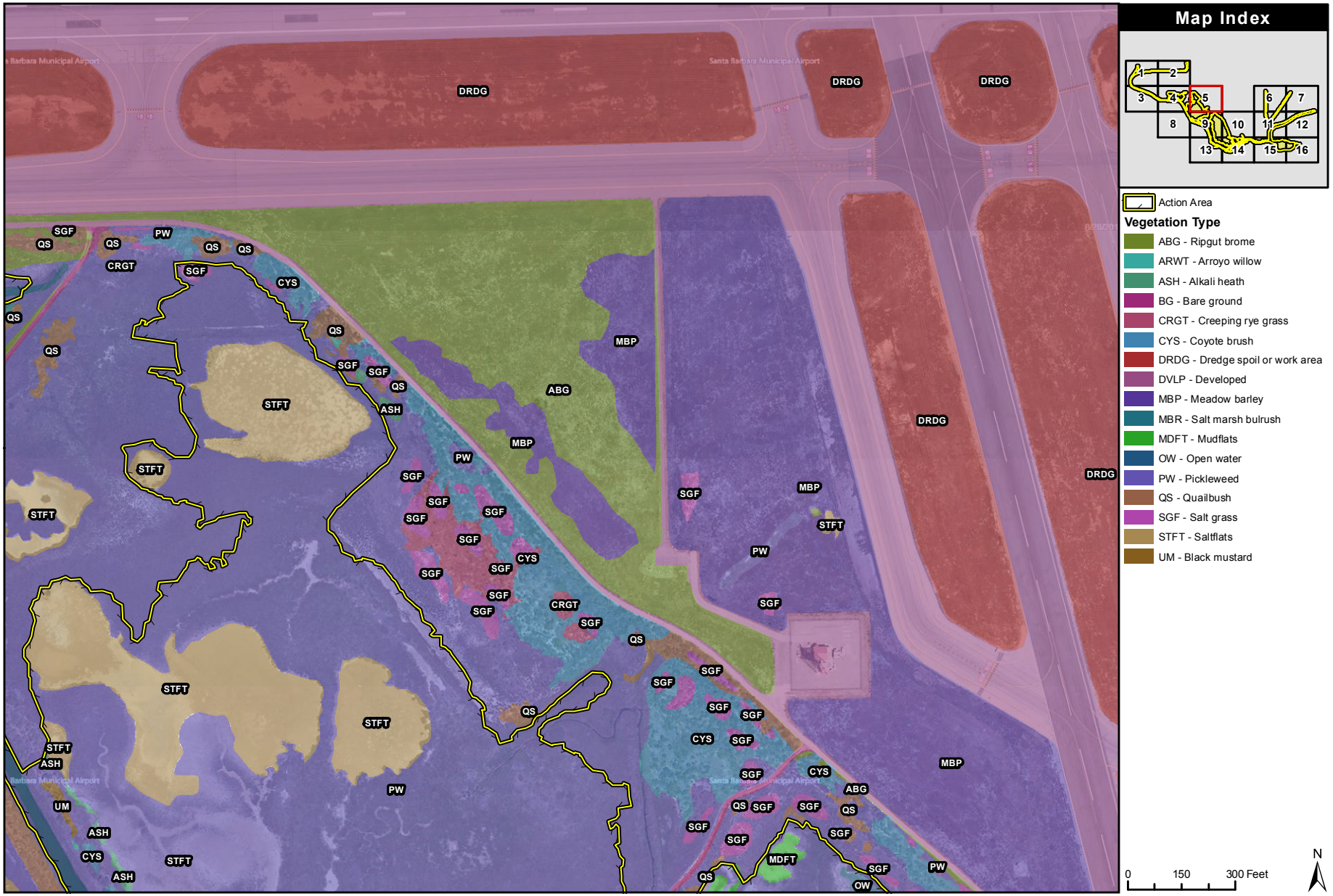
Vegetation Map of the Goleta Slough Study Area

Figure 5.4



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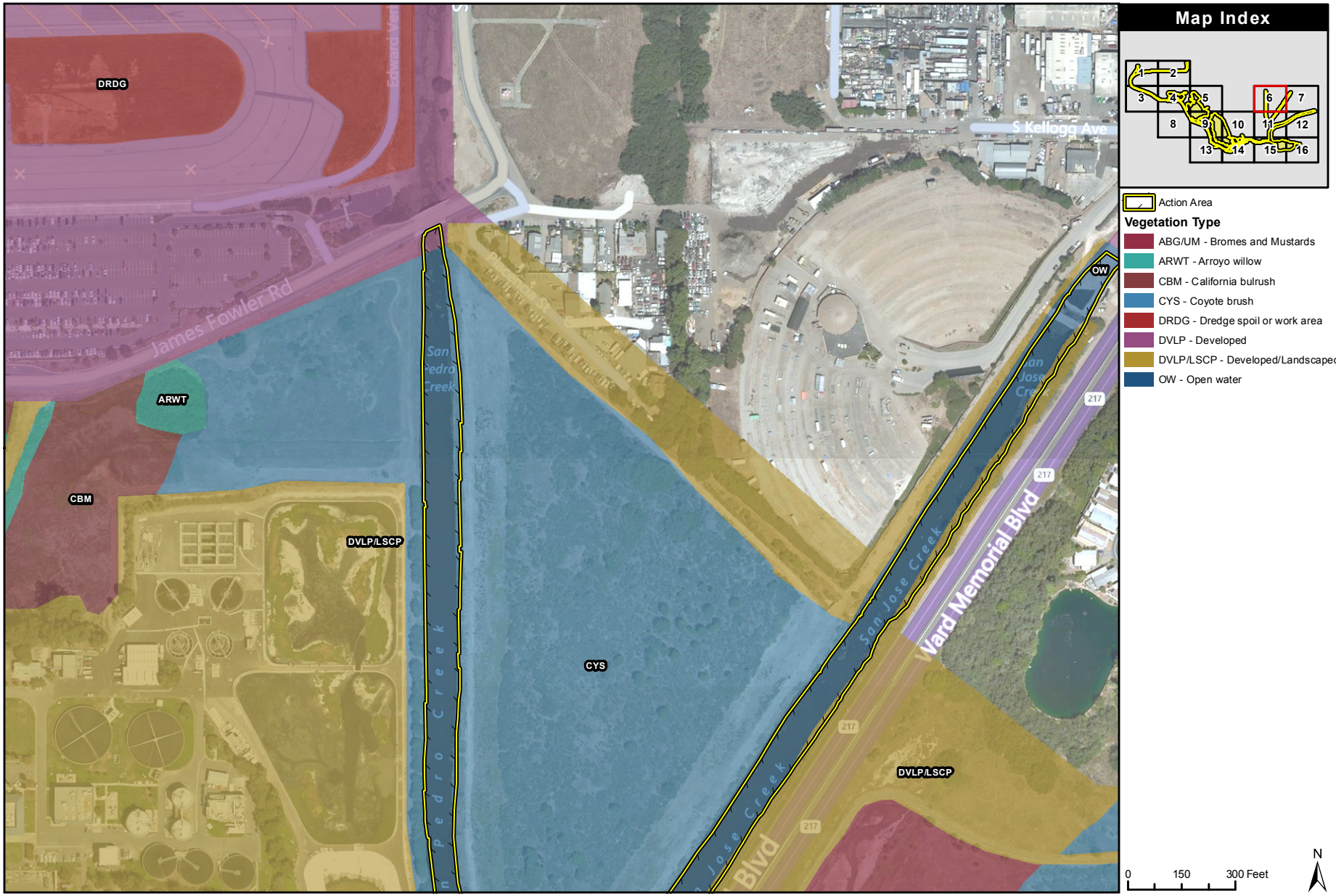
Vegetation Map of the Goleta Slough Study Area

Figure 5.5



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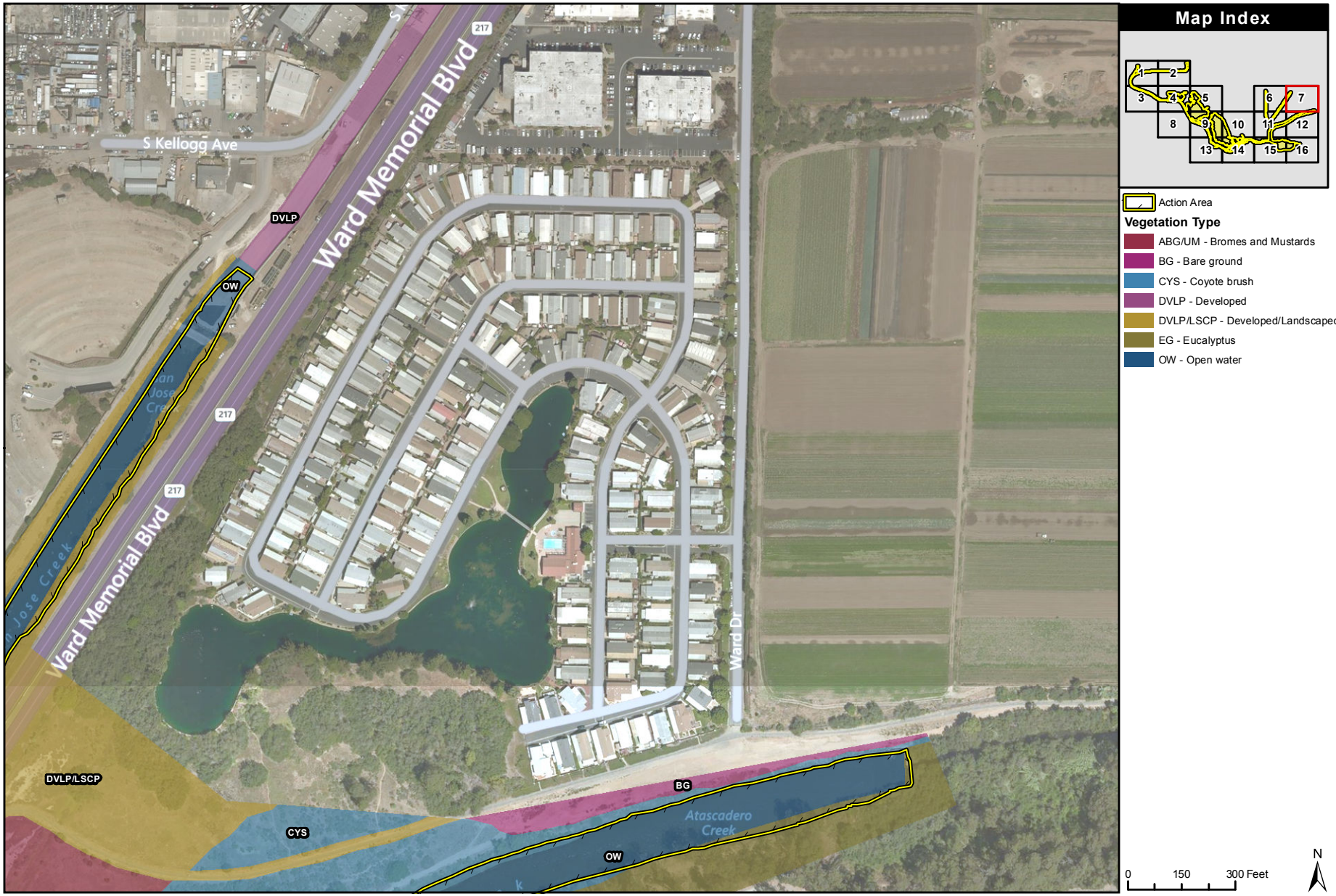
Vegetation Map of the Goleta Slough Study Area

Figure 5.6



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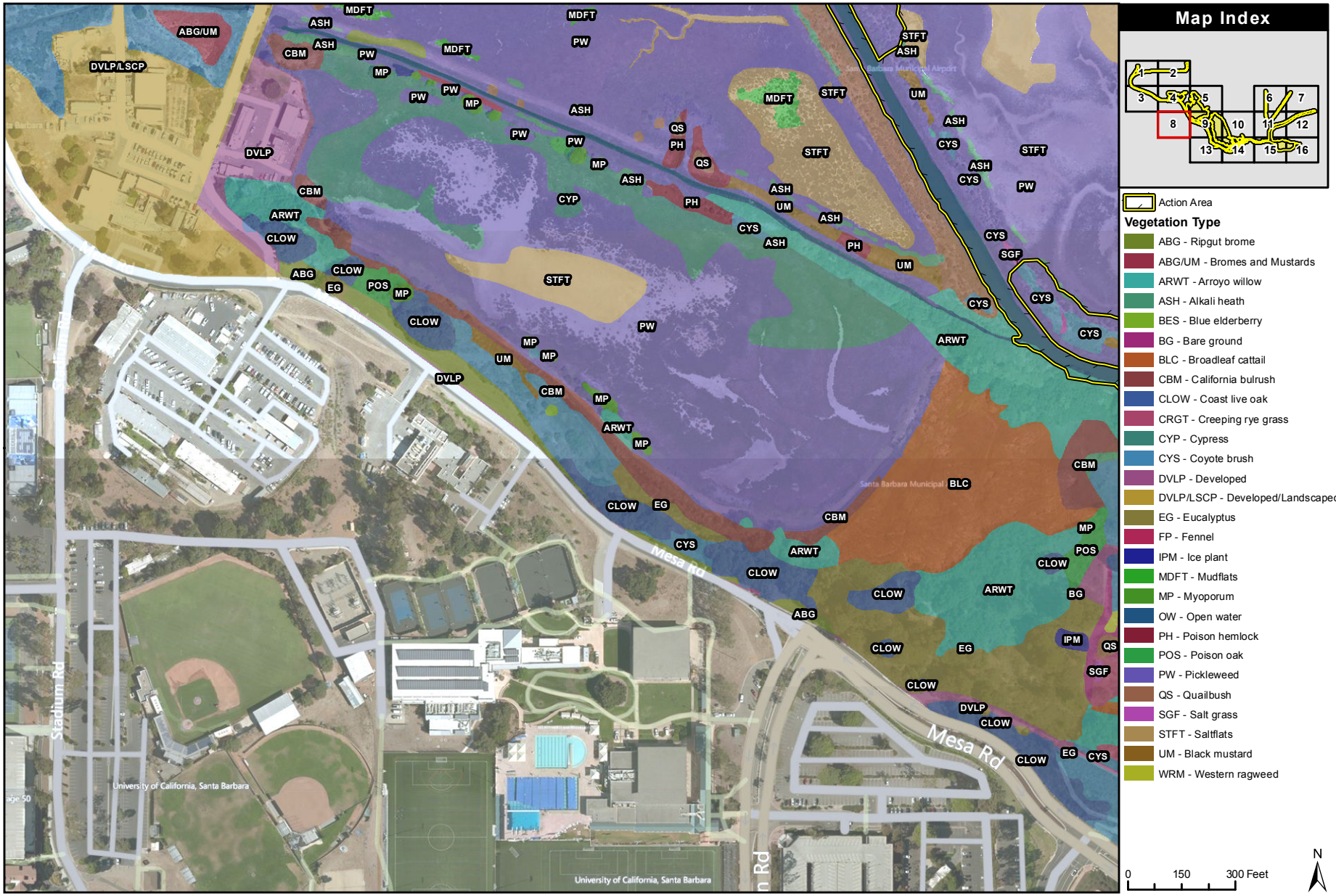
Vegetation Map of the Goleta Slough Study Area

Figure 5.7



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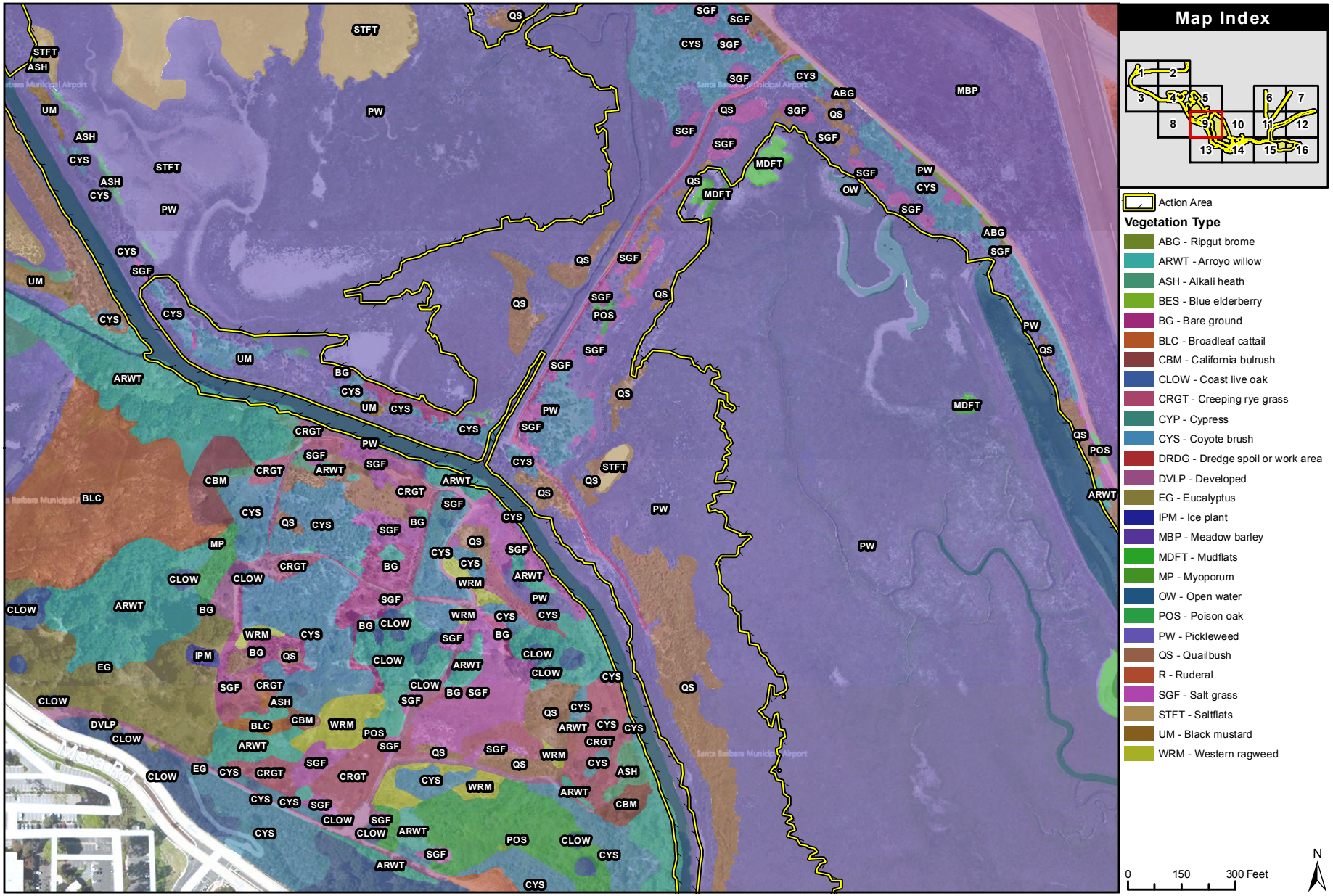
Vegetation Map of the Goleta Slough Study Area

Figure 5.8



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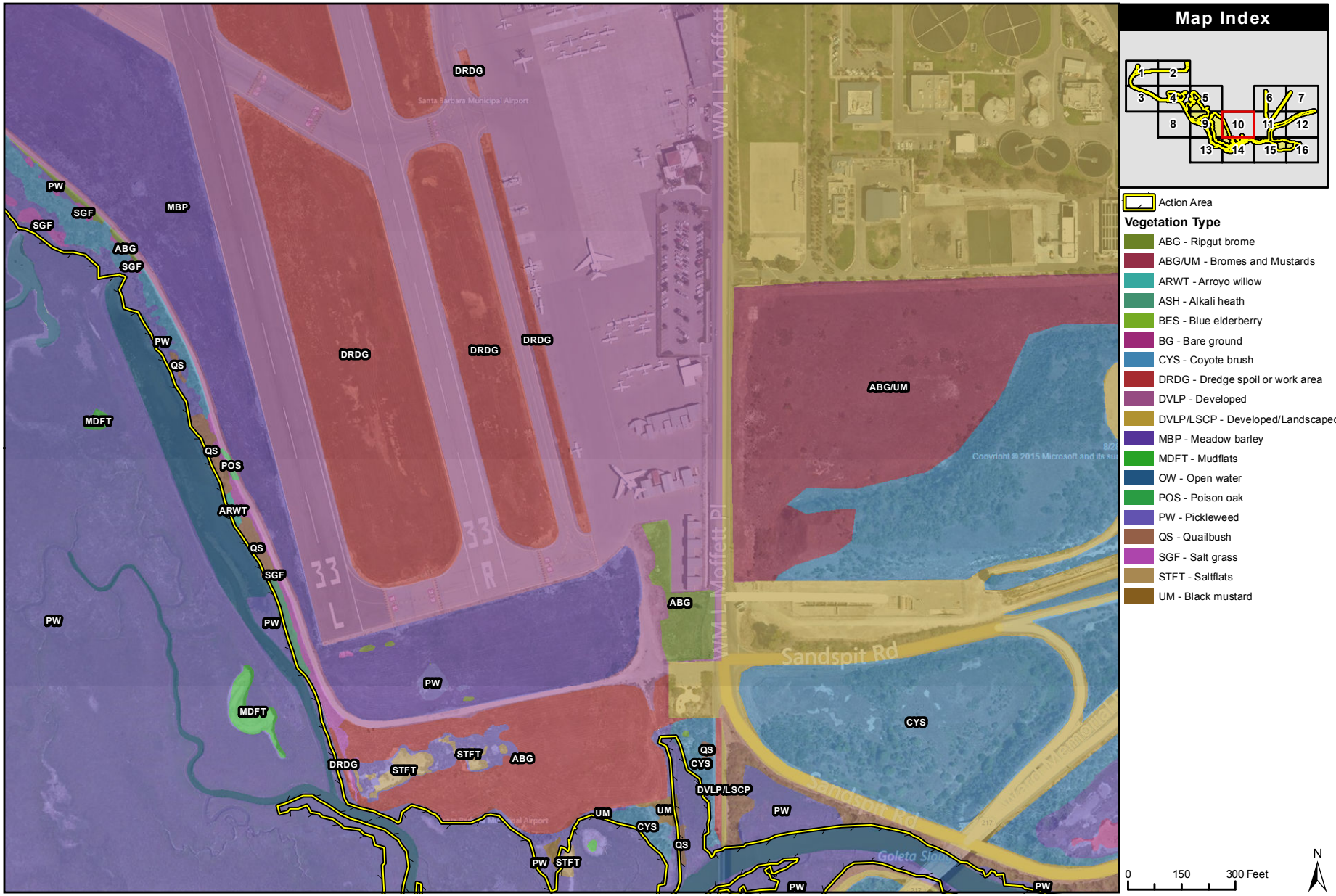
Vegetation Map of the Goleta Slough Study Area

Figure 5.9



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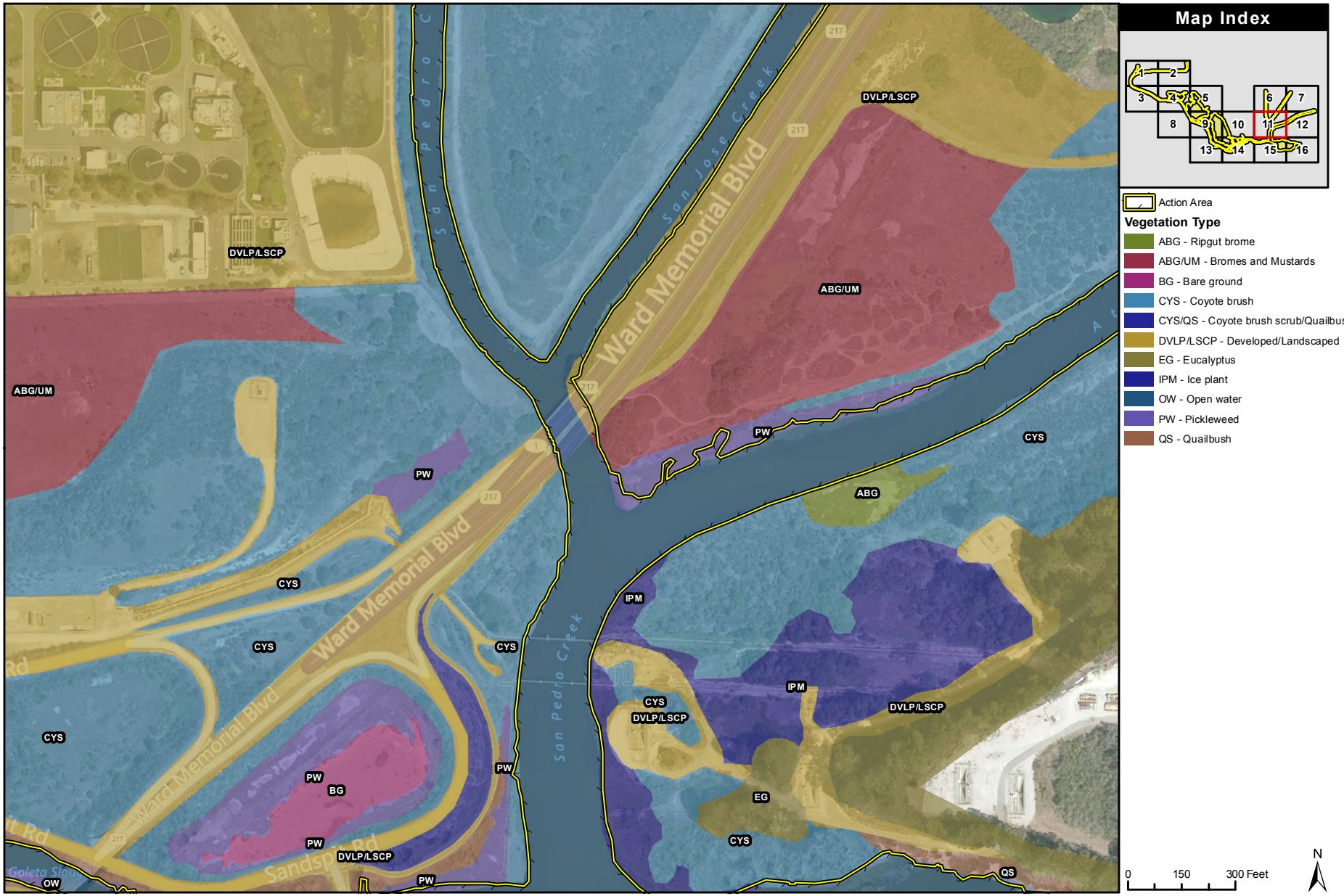
Vegetation Map of the Goleta Slough Study Area

Figure 5.10



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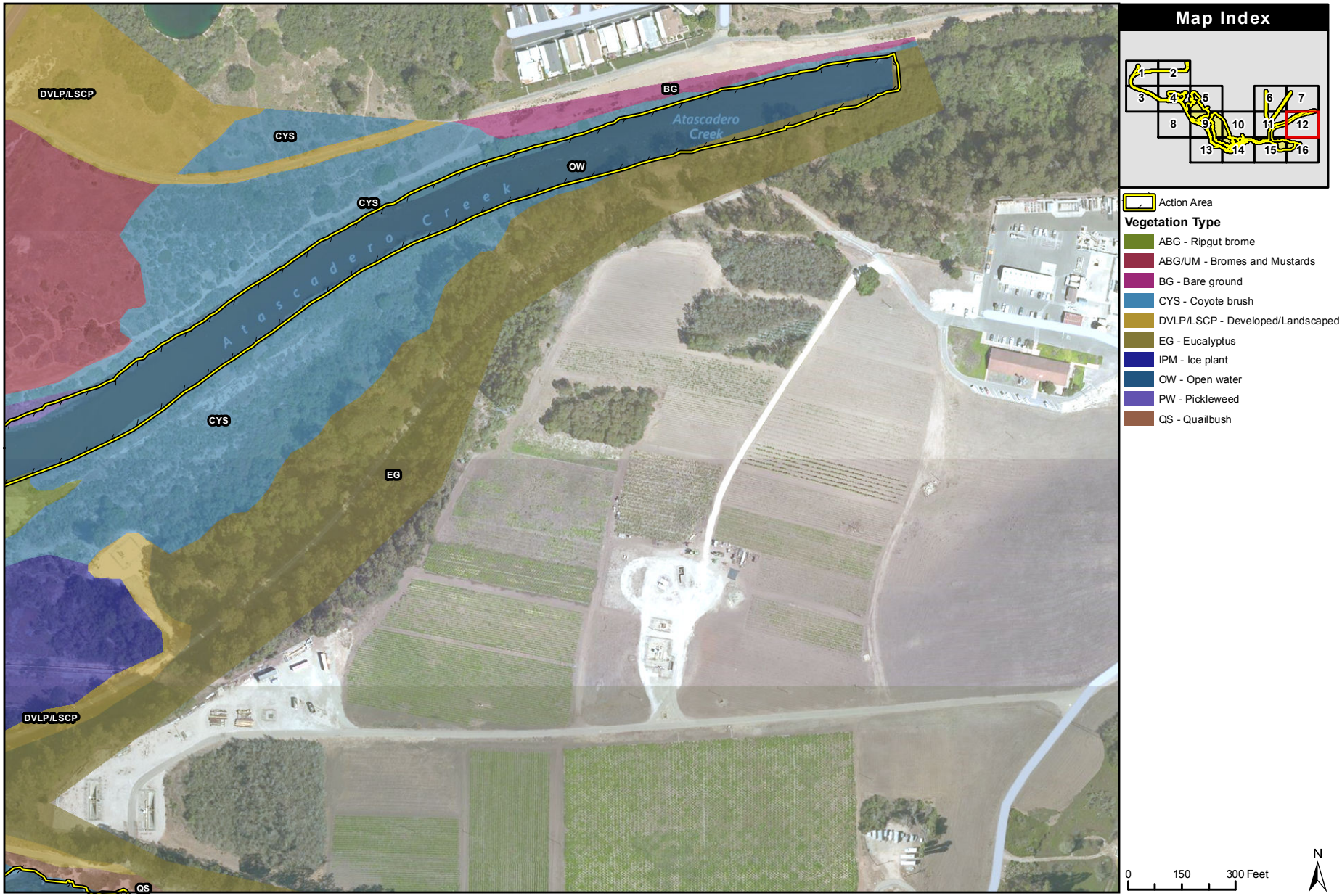
Vegetation Map of the Goleta Slough Study Area

Figure 5.11



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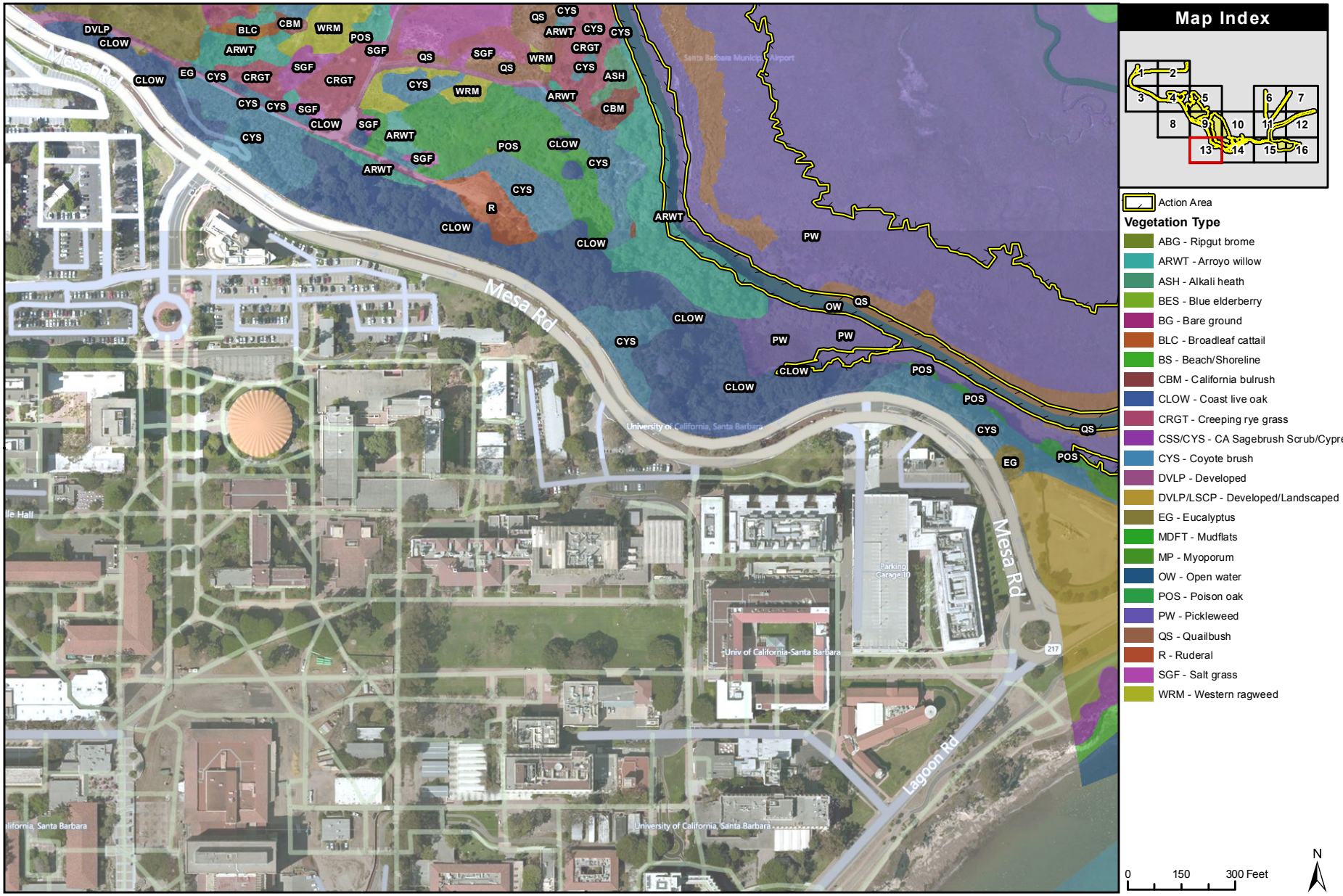
Vegetation Map of the Goleta Slough Study Area

Figure 5.12



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Vegetation Map of the Goleta Slough Study Area

Figure 5.13

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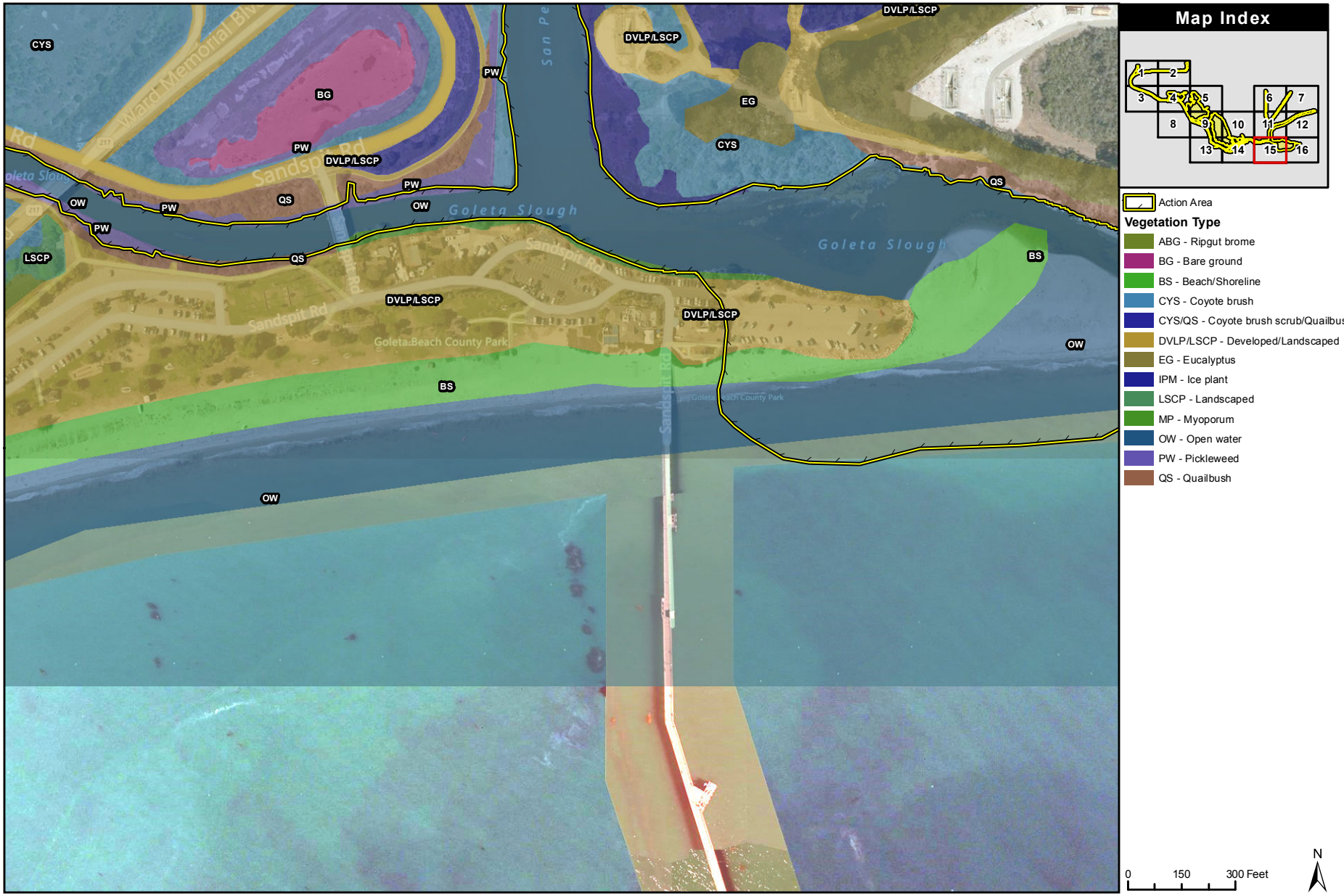
Vegetation Map of the Goleta Slough Study Area

Figure 5.14



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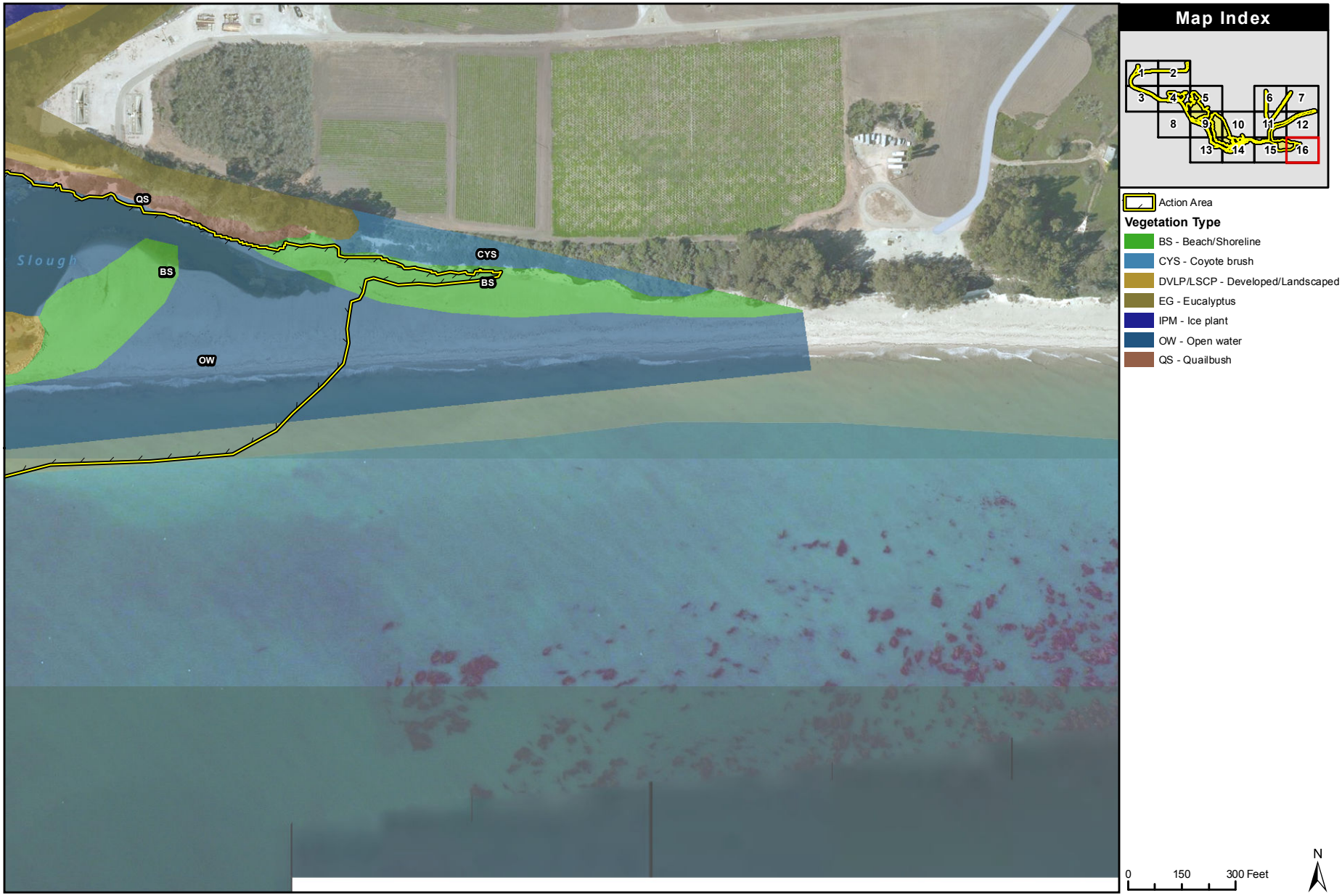
Vegetation Map of the Goleta Slough Study Area

Figure 5.15



Imagery provided by ESRI, Bing, and its licensors © 2013/2015. Additional data provided by Dudek 2012: Dudek, Rincon, Bash, and Stillwater 2015.

Vegetation Map of the Goleta Slough Study Area

Figure 5.16

5.0 SPECIES AND CRITICAL HABITAT CONSIDERED

Extensive biological studies have been conducted in Goleta Slough, including a variety of wildlife and botanical surveys. Several wildlife species listed under ESA have been observed in Goleta Slough and vicinity and therefore were considered for inclusion in this BA, as shown in Table 6. No plant species listed under ESA have been recorded at Goleta Slough.

Table 6. Federally Listed Wildlife Species Observed at Goleta Slough and Vicinity

Scientific name	Common name	Status	Observed?	Included?
Fish				
Oncorhynchus mykiss irideus	steelhead, Southern California DPS	Endangered	Y	Y
Eucyclogobius newberryi	tidewater goby	Endangered	Y	Y
Amphibians				
Rana draytonii	California red-legged frog	Threatened	N	N
Birds				
Charadrius nivosus	snowy plover	Threatened	Y	N
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	N	N
Falco peregrinus	peregrine falcon	Delisted	Y	N
Haliaeetus leucocephalus	bald eagle	Delisted	Y	N
Pelecanus occidentalis californicus	California brown pelican	Delisted	Y	N
Sternula antillarum browni	California least tern	Endangered	Y	N
Rallus longirostris levipes	light-footed Ridgway's rail	Endangered	Y	N
Vireo bellii pusillus	least Bell's vireo	Endangered	Y	N

5.1 SPECIES INCLUDED IN THE ANALYSIS

The Project will potentially influence the extent and quality of aquatic habitat; therefore, aquatic wildlife species occurring in Goleta Slough and listed under ESA are included in this BA. Species included are steelhead and tidewater goby, extensively discussed in Section 6.

5.2 SPECIES EXCLUDED FROM THE ANALYSIS

California red-legged frog (*Rana draytonii*) occurs on the coastal slope of southern California, in the coast ranges and immediate coast from central California north to Mendocino County, and in the foothills of the Sierra Nevada and the Cascade Range bordering the Central Valley. California red-legged frog can survive in a variety of habitat types, including various aquatic, riparian, and upland habitats, but are sensitive to high salinity. Preferred aquatic habitat of the California red-legged frog is characterized by dense shrubby, or emergent riparian vegetation, such as arroyo willow, cattails, and bulrushes, associated with deep (greater than two feet), still or slow-moving water. The California red-legged frog will also utilize ephemeral ponds, intermittent streams, seasonal wetlands, springs, seeps, permanent ponds, perennial creeks,

manmade aquatic features, marshes, dune ponds, lagoons, riparian corridors, blackberry thickets, nonnative annual grasslands, and oak savannas (U.S. Fish and Wildlife Service 2002). California red-legged frog occurs widely at suitable elevations in Santa Barbara County. It is known from the Goleta area from three locations several miles west and northwest of the airport: Bell Creek north of U.S. Highway 101, and Eagle and Tecolote Creeks near the Pacific Ocean. However, creeks within the study area are tidal and highly saline, and permanent fresh water ponds are absent. Therefore, this species is not included in the analysis because of the lack of suitable habitat and the absence of records of the species in Goleta Slough.

Western snowy plover (*Charadrius nivosus nivosus*) breeds in two distinct breeding populations in California. The interior population, a California Species of Special Concern, breeds in isolated locations in the San Joaquin Valley, northeastern California, the Owens Valley, southeastern deserts, and around Lake Elsinore in western Riverside County (Shuford et al. 2008). The federally listed Pacific population breeds along the coast from Washington State south through California. This population breeds on coastal sandspits, dune-backed beaches, beaches at creek mouths and lagoons, and salt pans at lagoons and estuaries. Western snowy plovers feed on vertebrates on the surface of wet sand, surf-cast kelp, dry sand above the high tide line, salt pans, spoil sites, and the edges of salt marshes, salt ponds, and lagoons. Current breeding locations for the Pacific population of snowy plovers are found in mainland Santa Barbara County at several locations along the north coast, and at Hollister Ranch and Coal Oil Point on the south coast. Goleta Beach, adjacent to Goleta Slough is a historic breeding location, and nesting plovers may have once foraged within Goleta Slough, but western snowy plovers have not been recorded nesting at this site since 1936 (Lehman 1994; U.S. Fish and Wildlife Service 2007; Lehman 2015). Goleta Beach has not supported wintering western snowy plovers since the early 1980s, other than a flock of up to 75 that were recorded from February to March 2013 (Lehman 2015). Continued high disturbance levels from humans and dogs are likely to continue deterring this species from nesting here. Because of the relative lack of suitable foraging habitat, migrant snowy plovers are unlikely to occur at the airport, including Goleta Slough. Therefore, this species is not included in the analysis.

Southwestern willow flycatcher (*Empidonax traillii extimus*) nests in southern California as far north as the southern Sierra Nevada and west to northern Santa Barbara County, where it occurs in small numbers along the Santa Ynez River from Buellton west to Vandenberg Air Force Base. The species nests in relatively extensive, usually mature riparian woodland with a multi-storied canopy and dense ground cover, usually near still or slow-flowing water. It hawks for insects in openings in the riparian canopy, normally using perches in the middle canopy. This subspecies is essentially indistinguishable in the field from other subspecies, which occur in the region only in migration. The southwestern willow flycatcher is probably observed regularly in the vicinity of the study area in migration, but other subspecies may be involved in observations of willow flycatchers. This species has not been recorded nesting in southern Santa Barbara County, and the structure of riparian habitat in the study area is not currently suitable. In addition, the Project is not expected to result in a decrease in the extent of suitable riparian habitat. Therefore, this species is not included in the analysis.

Peregrine falcon (*Falco peregrinus*) occurs widely across California. The American peregrine falcon (*F. p. anatum*), the subspecies that nests in California, is absent as a nester in the Central Valley and parts of the coast. It typically nests on ledges, and may sometimes nest on human-

made structures or in trees. Nests are usually near water and available prey, although this species may travel long distances from the nest to forage. They feed in open habitat, such as marshes, where they hunt mostly birds, ranging in size from songbirds to small geese (White et al. 2002). This species is present year-round in the Goleta area. It is seen frequently at Goleta Beach County Park and occurs regularly within the study area, where it may hunt in almost any open habitat. Although it is not known to nest in the immediate vicinity, and no nesting habitat occurs within the study area, it may nest near Goleta, such as in the Santa Ynez Mountains, and forage within the study area. Due to the lack of suitable nesting habitat, this species is not included in the analysis.

Bald eagle (*Haliaeetus leucocephalus*), within California, breeds and is a permanent resident in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties. Elsewhere in the state, it is largely an uncommon winter migrant, but breeds in isolated locations, such as the Lake Cachuma area in Santa Barbara County. It nests in large trees with open branchwork. For foraging, it requires large bodies of water, or free-flowing rivers with abundant fish, and adjacent snags or other perches. CNDDB included no nesting records for this species in the vicinity. In the study area, bald eagle has occurred on several occasions in recent years, in winter. However, it is not known to nest in southern Santa Barbara County. Therefore, this species was not included in the analysis because of the lack of nesting habitat.

California brown pelican (*Pelecanus occidentalis californicus*) nests in colonies on islands off the coast of California and western Mexico. Current nesting sites for this species in California are in the Channel Islands at West Anacapa Island and Santa Barbara Island. This species has also nested on San Miguel and Santa Cruz Islands. Breeding occurs from December to as late as August, with peak egg-laying occurring in March to April, corresponding with peak food availability near colonies. Brown pelicans roost on sandbars, beaches, jetties, and manmade structures along the shore. They primarily feed close to shore (Burkett et al. 2007). Nesting does not occur on the mainland, but this species commonly roosts on the shore of Santa Barbara County at all times of year (Lehman 1994). Despite its regular presence at Goleta Beach and just offshore, the brown pelican rarely ventures inland and is recorded relatively infrequently flying over Goleta Slough (D. Compton, personal observations). The Project is not expected to impact beach roosting by this species. Therefore, as the Project is not expected to affect roosting, and nesting habitat is absent in the vicinity, this species is not included in the analysis.

California least tern (*Sternulla antillarum browni*) nests locally along the coast from the San Francisco Bay area southward, including several locations in northern Santa Barbara County. It has also attempted to nest at Coal Point in recent years, and probably nested formerly in Goleta (Lehman 1994). California least terns occur on beaches, estuaries, lagoons, and in nearshore waters; they nest in relatively undisturbed areas, such as coastal dunes and exposed tidal flats, from May to August. Adults leave the few California nesting locations with still-dependent young in August and feed more generally along the coast before migrating south. This species occurs rarely in migration and during post-breeding dispersal along the shore adjacent to the study area. No suitable nesting habitat is present in the study area, and the Project is not expected to affect least terns foraging in the Project vicinity. Therefore, this species is not included in the analysis.

Light-footed-ridgway's rail (*Rallus longirostris levipes*), formerly "light-footed clapper rail," previously occurred as far north and west as Devereux Slough in Santa Barbara County (U.S. Fish and Wildlife Service 1985, Lehman 1994). Although apparently extirpated there by the 1990s, this species reappeared at Carpinteria Salt Marsh in 1993 and persisted until 2004. The only record for Ridgway's rails at that location since that year occurred in August through September 2011, when a bird was heard calling on several occasions (Santa Barbara Natural History Museum rare bird records). At Goleta Slough, this species was last observed in 1969 (Wilbur 1974; Lehman 2015). Published reports from 1971 and 1974 have not been substantiated by the cited observers (Wilbur 1974; Zembal et al. 1995; R. Webster pers. comm.; B. Schram per. comm.). No light-footed Ridgway's rails were observed during surveys conducted between 1976 and 2011 (Wilbur et al. 1979; Zembal et al. 1995), and none have been detected during extensive biological survey efforts of Goleta Slough since the 1970s. Light-footed Ridgway's rails forage in shallow water and mudflats for a variety of invertebrates; they seek cover in dense vegetation and place their nests high enough in vegetation to avoid flooding during high tides (U.S. Fish and Wildlife Service 2009). Stands of *Spartina* spp. (entirely lacking in Goleta Slough) are considered important for providing cover for the species, and the presence of small freshwater streams, ponds, and rushes are considered "beneficial for nesting, foraging, and cover" (U.S. Fish and Wildlife Service 1985).Construction of berms and the isolation of areas from tidal circulation have likely played a part in the disappearance of Ridgway's rails from Goleta Slough. Berms may also provide additional access to medium-sized predators such as common raccoons, red foxes, and skunks (Goleta Slough Management Committee 1997). In addition, the relatively uniform areas of pickleweed available within tidal portions of the slough are not optimal habitat. Because of the lack of recent records and poor habitat quality under existing conditions, this species is not included in the analysis.

Least Bell's vireo (*Vireo bellii pusillus*) formerly nested through the coastal slope of southern California, interior Coast Ranges of Central California, the San Joaquin and Sacramento Valleys and surrounding foothills, and parts of Inyo County. It now is limited to isolated locations of extensive riparian habitat in the southern California coastal slope and has bred in small numbers at widely scattered sites elsewhere in its former range (U.S. Fish and Wildlife Service 2006). Least Bell's vireos nest in dense riparian woodland, mostly in warmer climates of southern California, where it is present from late March through August. Least Bell's vireos mostly occur in major riparian systems, and are known in Santa Barbara County principally from the upper Santa Ynez River. Least Bell's vireos were formerly common along the middle and upper Santa Ynez River, were common on the river upstream of Gibraltar Dam as recently as the 1990s, and declined drastically there in recent years (Lehman 2015). There are only two breeding season records for the south coast in recent decades. One of these, from the Santa Barbara Municipal Airport, involved a bird that was singing in willows along Carneros Creek, north of the Runway 7, May 18–June 10, 2005 (Santa Barbara Museum of Natural History rare bird records). No additional birds were detected that year, and the bird was not detected later in the season, despite additional visits. Given the limited extent of willow riparian habitat at the airport, where it occurs principally along Carneros Creek and in Basin I, the likelihood of this species nesting is low. In addition, the Project is not expected to result in a decrease in the extent of suitable riparian habitat. Therefore, this species is not included in the analysis.

5.3 CRITICAL HABITAT

Goleta Slough is part of South Coast Hydrologic Unit 3315 of critical habitat for southern California steelhead (70 FR 52488-52627). It is also Unit SB-9 of critical habitat for tidewater goby (78 FR 8746-8819).

5.4 CONSULTATION TO DATE

Formal consultation under the currently Proposed Action has not been initiated. However, informal consultation with the NMFS and USFWS in the form of a conference call on April 15, 2014 to discuss aquatic habitat suitability criteria for steelhead and tidewater goby and a technical memorandum provided to the NMFS and USFWS on May 28, 2014 detailing proposed aquatic habitat suitability criteria for these species. Additionally, past consultation between the County and the aforementioned federal agencies related to Goleta Slough addressed a different set of circumstances and very different approaches from the currently Proposed Action.

6.0 SPECIES ACCOUNTS

This section presents species accounts for the listed species discussed in this Biological Assessment.

6.1 SOUTHERN CALIFORNIA COAST STEELHEAD DPS

The steelhead population that potentially occurs in Goleta Slough is part of the southern California steelhead Distinct Population Segment (DPS) which extends from the Santa Maria River in San Luis Obispo County to the U.S-Mexico border (NMFS 2006). This DPS is listed as endangered under the federal Endangered Species Act, and designated critical habitat includes Goleta Slough (NMFS 2006).

6.1.1 General Life History

Steelhead is the term used to denote the anadromous life-history form of rainbow trout (*O. mykiss*); because both anadromous and resident *O. mykiss* are found within the watershed, the term *O. mykiss* is used in situations where distinguishing juvenile steelhead from resident rainbow trout would be problematic. Preservation of both life-history forms is considered a high priority in the *Southern Steelhead Recovery Plan* (NMFS 2012). The relationship between anadromous and resident forms of *O. mykiss* is the subject of ongoing research. The two forms are capable of interbreeding and, under some conditions, either type can produce offspring that exhibit the alternate form (i.e., resident rainbow trout can produce anadromous progeny and vice-versa) (Zimmerman et al. 2009, Hayes et al. 2012, Kendall et al. 2014, Sloat et al. 2014). However, in some watersheds, the two types are distinct (e.g., Pearse et al. 2009).

Based on variability in life history timing, steelhead are broadly categorized into winter and summer reproductive ecotypes. Steelhead return to spawn in their natal stream, usually in their third or fourth year of life (Shapovalov and Taft 1954, Behnke 1992). Steelhead in the southern California DPS belong to the winter ecotype (winter-run). Winter-run steelhead generally enter spawning streams from late fall through spring as sexually mature adults following the first storm flows (a.k.a. "freshets") of the winter, with males typically returning to fresh water earlier than females (Shapovalov and Taft 1954, Behnke 1992, Busby et al. 1996). Spawning can occur from late fall into spring, with peak spawning activity between January and March, based upon data from other steelhead populations in the southern California steelhead DPS (Busby et al. 1996). Adult steelhead are known to stray from their natal streams to spawn in nearby streams and, in more hydrologically variable streams of the central and southern California coast, straying is often more prevalent than in more northern streams (Clemento et al. 2009, Pearse et al. 2009).

In central and southern California streams such as Scott Creek (Santa Cruz County), three possible life history strategies have been identified based upon usage of lagoon and stream rearing habitat: stream rearing, lagoon rearing, and combination stream and lagoon rearing (National Marine Fisheries Service 2012, Hayes et al. 2008). Stream-reared steelhead spend up to four years in the stream, and then outmigrate to the ocean with minimal lagoon residence (Shapovalov and Taft 1954). Lagoon-reared steelhead spend only a few months in the stream before migrating to the lagoon where they will rear for typically one year. Steelhead exhibiting

the combination strategy will rear for 1 to 2 years in the stream and 1 to 10 months in the lagoon before emigrating to the ocean (National Marine Fisheries Service 2012). Conditions for growth can be very good in lagoons relative to stream habitat, and thus fish in lagoons tend to achieve a larger size-at-age then their stream-reared counterparts (Smith 1990, Bond 2008, Hayes et al. 2008). Since larger smolts tend to have higher ocean survival, growth during lagoon rearing may increase ocean survival of steelhead smolts and survival to adulthood. Lagoon systems, therefore, can provide a potential demographic boost in two ways. First, lagoons may relax to some degree the density dependent bottleneck occurring in stream habitat. Second, lagoons provide an adjustment to a saline environment, which may increase smolt sizes and consequently improve ocean survival for both stream-reared and lagoon-reared fish. Smith (1990) concluded that even tiny lagoons unsuitable for summer rearing can contribute to the maintenance of steelhead populations by providing feeding areas during winter or spring smolt outmigration.

Timing of smolt outmigration necessarily depends on when adequate flow conditions are present to open the streams and lagoons to the ocean, since sandbars build up and seal off many confluences, including Goleta Slough (e.g., Smith 1990). In Santa Rosa Creek to the north, outmigrant trapping suggests that some individuals rear in upstream reaches before outmigrating as smolts, and some outmigrate to the lower reaches and lagoon at smaller sizes/younger ages (Nelson et al. 2009). Estuarine rearing may be more important to steelhead populations in the southern half of the species' range due to greater variability in ocean conditions and lack of high quality nearshore habitats in this portion of their range (NMFS 1996).

6.1.2 Distribution in the Action Area

Both anadromous and resident O. mykiss occur within tributaries to Goleta Slough (Stoecker 2002, National Marine Fisheries Service 2013, as cited in U.S. Army Corps of Engineers 2014), although detailed information on the relative proportion of each type is not available. Little data on steelhead spawning timing exists for Goleta Slough, although both spawning timing and distribution within the basin is related to timing, frequency, and duration of sandbar opening and winter flow conditions. Adult steelhead occurrence in Goleta Slough is necessarily limited to periods when the estuary is open, at which point adults are expected to use it as a migration corridor to the upper watershed as soon as water depth in the river allows. Timing of smolt outmigration also depends on when adequate flow conditions are present to connect the estuary to the ocean.

Juvenile steelhead may rear for extended periods within upstream freshwater habitats of the Goleta Slough depending upon seasonal variations in rainfall that control the extent of wetted channel and connectivity from the Slough to upstream locations. Juvenile O. mykiss have been reported in upstream habitats of Atascadero, San Jose, San Pedro, and Tecolotito creeks as well as in some of their tributaries including West Fork San Jose Creek, and Maria Ygnacio and San Antonio creeks which flow into Atascadero Creek (Stoecker 2002). Adult steelhead have been reported in the lower sections (south of Highway 101) of San Pedro, Atascadero, and Maria Ygnacio creeks (Stoecker 2002). In 2013, two adult steelhead and numerous juveniles were observed by NMFS staff in Atascadero Creek below the drop structure (i.e., grade control) at the Patterson Avenue Bridge (National Marine Fisheries Service 2013, as cited in U.S. Army Corps

of Engineers 2014). Steelhead in the San Gregorio and Scott Creek lagoons to the north use a rearing strategy that includes 1–2 years of residency in upstream habitats followed by lagoon rearing on the order of weeks to months before emigrating to the ocean (Hayes et al. 2008, Atkinson 2010).

Although closed-mouth conditions may force periods of lagoon rearing, little is known regarding habitat use within the Goleta Slough. Numerous tidewater goby protocol surveys conducted throughout the Slough between 2006 and 2008 reported no capture of steelhead (URS Corporation 2008a,b,c,d, URS Corporation 2009c), although the survey methods are unlikely to be effective for capture of steelhead. Under open-mouth conditions in the Goleta Slough, steelhead are assumed to use the lagoon habitat primarily as a migratory corridor, although there is potential for rearing within the freshwater/brackish ecotone.

Under the current management regime, the Goleta Slough system consists of a closed sandbar and non-tidal slough during summer and fall. During the last two winters, emergency conditions have necessitated breaching the sandbar, resulting in tidal conditions until the sandbar re-forms naturally, typically during early summer. However, these actions are not carried out under permit from regulatory and jurisdictional agencies, and there is no certainty of managed breaches occurring in the future or that the timing of breaching will support steelhead adult or smolt migration opportunities.

As described in detail in Rincon et al. (2015), water quality in Goleta Slough currently provides suitable rearing conditions for steelhead during the winter and spring, but it appears that rearing conditions in the slough are rendered unsuitable by high water temperatures and high salinity during summer with the bar open or closed. In more northerly California lagoons where steelhead are observed to rear during summer (e.g. San Gregorio Creek, Pescadero Creek, and Scott Creek lagoons), steelhead persist despite otherwise stressful conditions by using upper reaches of the lagoon where freshwater inflows moderate temperatures, salinity, and dissolved oxygen (DO) (Smith 1991, Atkinson 2010, Hayes et al. 2012). In addition, stratified areas within the lagoons occur where a layer of cooler, low saline water with a high DO concentration sits on top of a layer of high saline, warm water with a low DO concentration. Although unsuitable water quality conditions in Goleta Slough during summer 2014 may have been exacerbated by the extremely low freshwater inflows into the slough resulting from a prolonged and severe drought, the influence of a low volume of freshwater inflow did not appear adequate to moderate poor water quality in the upper channels. In addition, although slight stratification was observed in the main slough channel, it consisted of a layer of warmer water on the surface rather than the condition in the aforementioned lagoons in which high saline, warm water occurs at the bottom and appears to support suitable steelhead rearing conditions. Although brief periods of rearing may be possible for juvenile steelhead migrating downstream from tributaries during fall, winter, or spring, conditions during summer do not appear suitable to support an extended lagoon rearing life history for steelhead, regardless of whether the bar is open or closed.

6.1.3 Population Trends

At present, only an estimated 500 adult steelhead remain in the Southern California DPS north of Malibu Creek, California (National Marine Fisheries Service 1997). No population monitoring data is available for Goleta Slough or its tributaries.

6.2 TIDEWATER GOBY

Tidewater goby are an estuarine/lagoon adapted species that are endemic to California coast, mainly in small lagoons and near stream mouths in the uppermost brackish portion of larger bays (Moyle 2002, U.S. Fish and Wildlife Service 2005). The population in the Goleta Slough is federally listed as endangered under the Endangered Species Act, and critical habitat is designated to include Goleta Slough (62 FR 43937).

6.2.1 General Life History

The tidewater goby is a short-lived (generally 1 year) and highly fecund species (females produce 300–500 eggs per batch and spawn multiple times per year) that disperses infrequently via marine habitat but has no dependency on marine habitat for its life cycle (Swift et al. 1989, Lafferty et al. 1999). Tidewater gobies inhabit discrete lagoons, estuaries, or stream mouths separated by mostly marine conditions, and are generally absent from areas where the coastline is steep and streams do not form lagoons or estuaries (U.S. Fish and Wildlife Service 2005). Tidewater gobies feed mainly on small animals, usually mysid shrimp (*Mysidopsis bahia*), gammarid amphipods (*Gammarus roeseli*), and aquatic insects, particularly chironomid midge (Diptera: *Chironomidae*) larvae (Swift et al. 1989; Swenson 1995; Moyle 2002). Swenson (1996) found that juvenile tidewater gobies are generally day feeders, whereas adults mainly feed at night (U.S. Fish and Wildlife Service S 2005). Tidewater gobies use three different foraging styles to capture benthic prey: plucking prey from the substrate surface, sifting sediment in their mouth, and mid-water capture (U.S. Fish and Wildlife Service 2005).

Reproduction begins in spring, usually late April or May, and continues into the fall, although usually the greatest numbers of offspring are produced in the first half of this time period. The reproduction period is generally associated with the closure and filling of the estuary (late spring– fall). Breeding occurs in slack shallow waters of seasonally disconnected or tidally muted lagoons, estuaries, and sloughs. Males dig burrows vertically into sand, 100–200 mm [4–8 in] deep, and defend the burrows until hatching (Santa Clara River Project Steering Committee 1996). The eggs take approximately 6–10 days to hatch at about 15–25°C, with newly hatched tidewater gobies reaching a standard length of approximately 4–5 mm (0.17–0.25 in) (Moyle 2002). Larvae are planktonic (unable to swim freely) for 1–3 days before they become benthic (U.S. Fish and Wildlife Service 2005). The larvae apparently spend a day to a few weeks in open water until they reach approximately 16–18 mm (0.6–0.7 in) length, then sink down to the lagoon floor to enter the benthic juvenile lifestage until reaching sexual maturity at 24–27 mm (0.9–1.1 in) (Moyle 2002).

The average size of adult tidewater gobies tends to be significantly larger in marshes (43–45 mm [1.7–1.8 in] standard length) when compared to tidewater gobies from lagoons or creek habitats (U.S. Fish and Wildlife Service 2005, Swenson 1999). This may be because the more stable

physical conditions of the marsh foster improved growth or a more consistent or abundant supply of prey (U.S. Fish and Wildlife Service 2005, Swift et al. 1997).

6.2.2 Distribution in the Action Area

Tidewater gobies have been observed throughout most sections of the Goleta Slough. Numerous protocol surveys for tidewater goby were conducted in Goleta Slough between 2006 and 2009 (Table 7), with few efforts conducted since. During 2008 surveys tidewater gobies were observed in many locations of the Goleta Slough, albeit with variability in their distribution and abundance among surveys (Table 7). Tidewater goby have been observed in the Tecolotito, Los Carneros, and Atascadero channels of the slough (Figure 2). In the Tecolotito channel, tidewater gobies were observed just downstream of the Hollister Avenue crossing, and at 100 m, 300 m, and 400 m downstream of the confluence with the Los Carneros Channel (Figure 2) (URS Corporation 2008d). In the Los Carneros Channel, they have been observed just downstream of the Hollister Avenue crossing and approximately 400 m downstream of the Hollister Avenue crossing (URS Corporation 2008d). Protocol surveys conducted in July 2008 resulted in no tidewater goby observations in either Tecolotito or Los Carneros Channels (URS Corporation 2008d). Surveys conducted in September 2009 in the Atascadero Channel and downstream into the main body of Goleta Slough found no tidewater gobies, while surveys conducted at the same locations in October of the same year captured tidewater gobies throughout the sample area, although abundance was low (URS Corporation 2009c). In two surveys conducted in the San Pedro Channel (URS Corporation 2008a, 2008b) and three surveys in San Jose Channel (URS Corporation 2008a, 2008b, Rincon pers. Comm.) no tidewater goby were observed.

As described in detail in Rincon et al. (2015), water quality conditions measured in Goleta Slough in 2014 were suitable for tidewater goby in the main channel during spring with an open bar and fall with a closed bar. Water temperatures were observed to be too warm for tidewater goby during summer in the main channel. Water temperatures were too warm for tidewater goby in all of the tributary channels to the slough during spring and summer, and some tributary locations had suitable temperatures during fall and winter, regardless of the bar being open or closed. In addition, salinities were in excess of suitable ranges for tidewater goby rearing habitat year-round, under both open and closed-bar conditions. Based on the general water quality conditions observed in 2014, the presence of tidewater goby in Goleta Slough is not likely. These conditions appear to persist regardless of whether the slough is open to tidal influence or not. However, tidewater gobies have been documented to occur in upper sections of Tecolotito and Carneros channels, at temperatures from 23.5–25.3°C (URS Corporation 2008d), and in salinities up to 30.0 parts per thousand (ppt) in Atascadero Channel (URS Corporation 2009c) when the bar was open. Overall, it appears that while water quality conditions in Goleta Slough are generally not within the reported range of suitability for tidewater goby, the population tolerates conditions more severe than their suitable or preferred range would indicate. This may also explain in part the dramatic fluctuations observed in their abundance, with most sampling efforts observing no tidewater gobies, and then large numbers occasionally observed. It may be that the tidewater goby population spawns and expands in years of suitable conditions, and a small number of individuals find refuge habitat and persist through the years of poor conditions. Based on the prolonged drought in California in 2014, we suspect the conditions observed in 2014 represent a particularly poor year.

Table 7. Tidewater Goby Observations in Goleta Slough Based on Surveys Conducted Between 2006 and 2013.

Slough Channel	Location	Sample Date and Number Observed									
		Aug 2006	Sept 2006[1]	May 2007	Aug 2007	May 2008	Jul 2008	Aug 2008	Sept 2009	Oct 2009	May 2013
Tecolotito	Upper Finger, relocation effort	1,399[d]	--	--	--	--	--	--	--	--	--
	Lower Finger, relocation effort	--	69[d]	--	--	--	--	--	--	--	--
	Main Channel, relocation effort	--	2[d]	--	--	--	--	--	--	--	--
	Just downstream of Hollister Ave	2[d]	--	0[d]	0[d]	0[d]	0[d]	--	--	--	--
	100 m downstream of Los Carneros Channel confluence	--	--	6[d]	0[d]	4[d]	0[d]	--	--	--	--
	300 m downstream of Los Carneros Channel confluence	--	--	9[d]	3[d]	23[d]	0[d]	--	--	--	--
	400 m downstream of Los Carneros Channel confluence	--	--	0[d]	1[d]	41[d]	0[d]	--	--	--	--
Los Carneros	Upper Finger	31[d]	--	--	--	--	--	--	--	--	--
	Lower Finger	--	1[d]	--	--	--	--	--	--	--	--
	Just downstream of Hollister Ave	0[d]	--	192[d]	1[d]	20[d]	0[d]	--	--	--	--
	400 m downstream of Hollister Ave	0[d]	--	18[d]	0[d]	17[d]	0[d]	--	--	--	--
San Jose	Upper tidal extent, bar closed	--	--	--	--	--	--	--	--	--	0[f]
	Locations not specified	--	--	--	--	--	0[a]	0[b]	--	--	--
San Pedro	Locations not specified	--	--	--	--	--	0[a]	0[b]	--	--	--
Atascadero	Locations not specified	--	--	--	--	--	0[a]	0[b]	--	--	--
	Upstream end of channel	--	--	--	--	--	--	1[b]	0[e]	3[e]	--
	Near confluence with San Jose Channel	--	--	--	--	--	--	--	0[e]	4[e]	--
	Mid-channel	--	--	--	--	--	--	--	0[e]	3[e]	--
Main Channel	Along West bank at pipe crossing	--	--	--	--	--	--	--	--	1[e]	--

[1] results from relocation effort [a] URS Corporation 2008a, [b] URS Corporation 2008b, [c] URS Corporation 2008c, [d] URS Corporation 2008d, [e] URS Corporation 2009c, [f] Rincon pers. Comm. 2014
Slough mouth was open during all surveys, unless otherwise noted.

6.2.3 Population Trends

Tidewater gobies still occur within their historical range, but over half of the populations at these localities are extirpated or extremely small with uncertain long-term persistence (USFWS 2005). The population within Goleta Slough has not been regularly monitored. During protocol surveys conducted in Goleta Slough between 2006 and 2009 tidewater gobies were observed at many locations, albeit with variability in their distribution and abundance among surveys (Table 7).

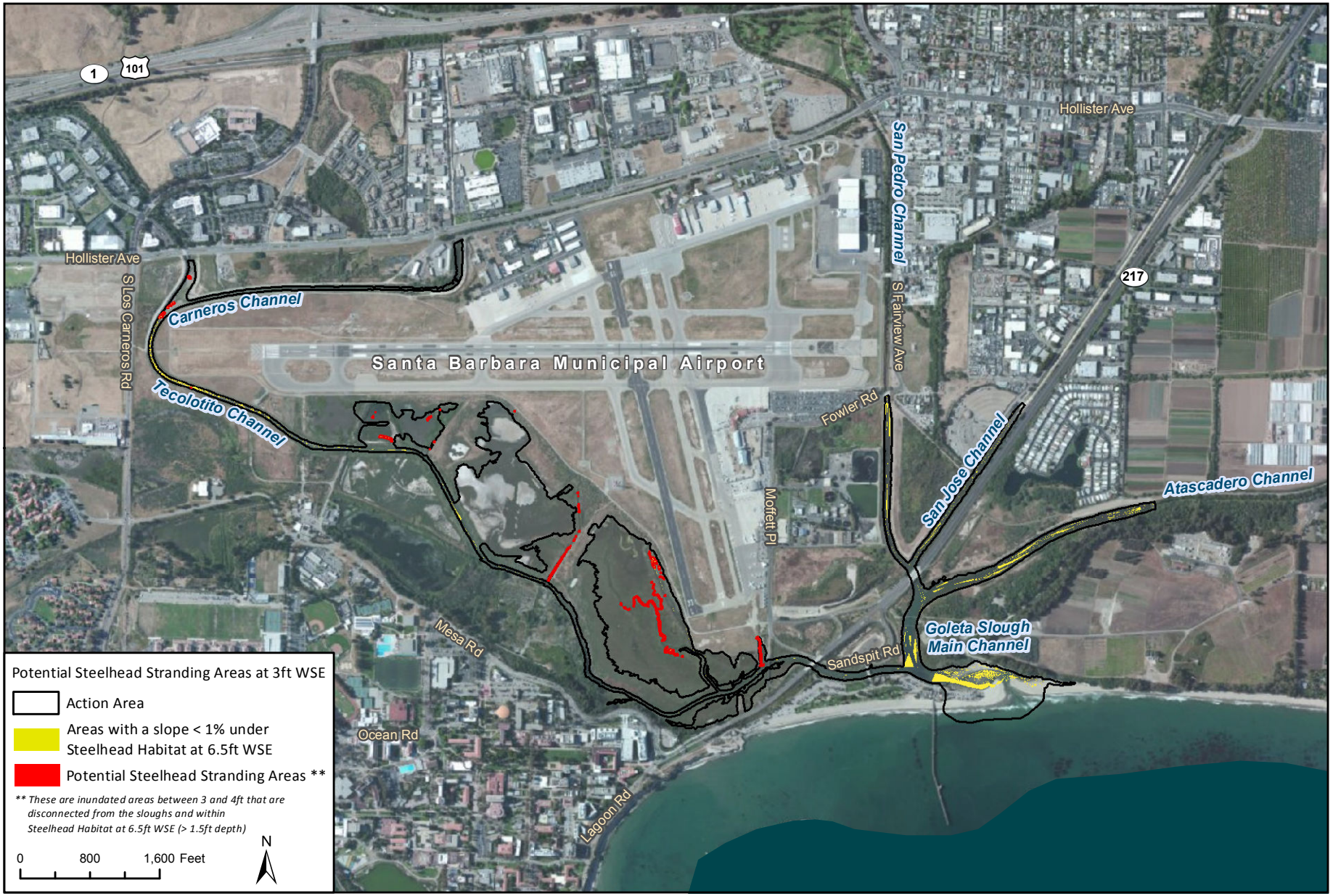
7.0 EFFECTS ANALYSIS

This section analyzes effects of the Proposed Action on southern California coast steelhead, tidewater goby, and designated critical habitat for both species in the Action Area. Under the Proposed Action Goleta Slough would have a natural sandbar formation during late spring or early summer, resulting in a non-tidal closed bar slough during summer and fall. There would be a managed breach of the slough during late fall or winter when WSEs exceed 6.5 feet, resulting in a tidally fluctuating slough prior to natural sandbar formation. If WSEs were to exceed 6.5 feet during summer, siphon pumping would be used to reduce WSEs to 5.0 feet, without a breach. This Proposed Action would result in several direct, indirect, and cumulative effects on the southern California coast steelhead DPS and tidewater goby, as described below.

7.1 SOUTHERN CALIFORNIA COAST STEELHEAD DPS

7.1.1 Direct Effects

Under the Proposed Action, managed breaches of the Goleta Slough sandbar are likely to occur during most years. Breaches are anticipated to occur during fall or winter during rain events, which also coincide with suitable water quality conditions for steelhead rearing within the slough (Section 3.2.1). When a breach occurs, the WSE of the slough will likely drop rapidly, posing a stranding risk for any juvenile steelhead that are rearing within the slough within flat areas or isolated pools. In the Santa Clara River Estuary an artificial breach event in September of 2010 resulted in mortality of at least several steelhead (Cardno/Entrix 2010). Similar direct effects could occur in a managed breach under the Proposed Action. Figure 6 illustrates the areas that are vulnerable to stranding if a breach event were to occur at an average tide (3 feet) when the slough was inundated to 6.5 feet. Around 20% of the available suitable steelhead rearing habitat at 6.5 feet poses a risk of stranding. This is a conservative assessment (i.e., an overestimate) of potential stranding, since in the past managed breach events have very often been conducted at higher tides, which would have less potential to strand fish. For example, in December of 2014 an emergency breach event was conducted when the tide was at 6.2 feet. There are a few areas, located mostly in the lower main channel and within a few areas of the tributary channels, where slopes are less than 1% and a high risk of stranding could occur during a breach event (Figure 6). There are also a few areas within wetlands that could become isolated pools of water exposing steelhead to increased predation risk or desiccation. If multiple breaches were to occur under the Proposed Action within a year, each breach could potentially result in steelhead stranding. Frequency of breach events is dependent on depth of scour during breach event, the timing and amount of rainfall events (more rain results in more rapid filling of slough), and wave action (larger waves result in more rapid slough closure). Based on the hydrological conditions observed in 2010 through 2014, ESA (2015) used a quantified conceptual model to predict that under "typical" conditions two or possibly three managed breach events could occur each year under the Proposed Action.



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Potential Stranding Areas for Steelhead

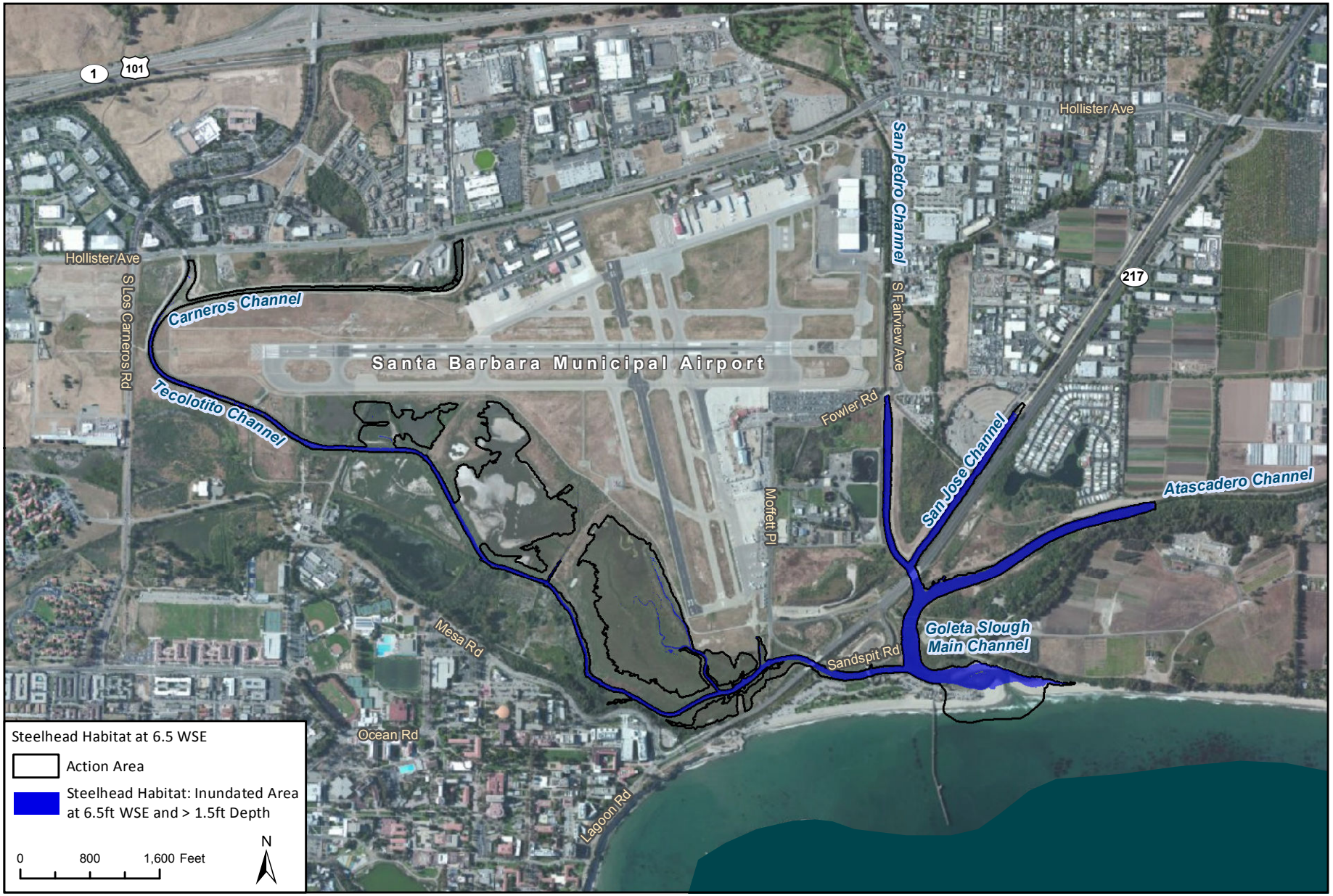
Figure 6

Under the Proposed Action, siphon pumping could occur during the dry season (typically July through September) of some years. ESA (2015) predicted that it is unlikely for water levels in Goleta Slough to exceed 6.5 feet during the summer months under typical conditions other than during extreme high tides or large wave events. It is possible that an unseasonably late rain event with a closed lagoon mouth could cause ponded water levels to exceed 6.5 feet. Under the Proposed Action, if water levels above 6.5 feet were to occur during the summer months, a siphon pump would be used to reduce the WSE to 5.0 feet. The direct effects of this reduction in WSE could be entrainment in pumps, or the stranding of steelhead in isolated pools, as described for a breach action. All pumping actions would include exclusion netting to prevent entrainment, and stranding within low gradient areas would be highly unlikely, due to the low rate of water surface decline during siphon pumping actions. In addition, water quality conditions in Goleta Slough in 2014 (Section 5.1.2) indicate that steelhead rearing in the slough would be unlikely, due to high water temperatures and high salinity during summer. Thus if conditions do not support steelhead rearing within the slough during the dry season, the risk of steelhead being directly affected by siphon pumping is negligible.

7.1.2 Indirect Effects

In addition to the potential direct effects described above, the Proposed Action could have indirect effects on steelhead. At a WSE of 6.5 feet, suitable rearing habitat for steelhead would occur throughout the slough (Figure 7). Following a breach, the amount of stable, inundated habitat would be reduced. Some of these areas would still be accessible during tidal fluctuations, but the suitability would decrease since this would not be stable non-fluctuating habitat. The potential breach elevation under natural conditions can vary substantially depending on the season, the duration since a previous breach, wave action, and the rate of inflows from tributary watersheds (ESA 2015). Although data on breaches at Goleta Slough are lacking, historically breaches occur naturally or from management actions to protect infrastructure from flooding at WSEs of up to 8.5 feet (ESA 2015). Breaching the slough when the WSE in the slough is 6.5 feet rather than 8.5 feet would result in a 69% decrease in stable (non-fluctuating) suitable steelhead rearing habitat compared with a natural slough breach occurring at a WSE between 7 and 10 feet, with a WSE at 10.0 feet typically required for a natural breach to actually occur (ESA 2015) which is 1.0 foot greater than the WSE at which the airport and surrounding areas experience flooding.

Much of what constitutes suitable habitat for steelhead is inundated vegetation, mostly at elevations greater than around 4.5 feet (Figure 8). Although an increase in WSE inundates vegetation and provides more suitable habitat, the development of these plant communities could not occur if they were continuously inundated, with the exception of the emergent freshwater marsh community. For brackish salt marsh vegetation to persist, the WSE of the slough must continue to fluctuate for at least part of the year (Zedler 1982). If the WSE were to be managed at a constant or increasing level, the habitat that is currently pickleweed would become mud (Josselyn 1983, Sadro et al. 2007). Therefore, breaching the sandbar has the indirect effect of temporarily reducing available habitat for steelhead, while simultaneously supporting a natural process that creates suitable habitat for steelhead.



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Suitable Habitat for Steelhead

Figure 7

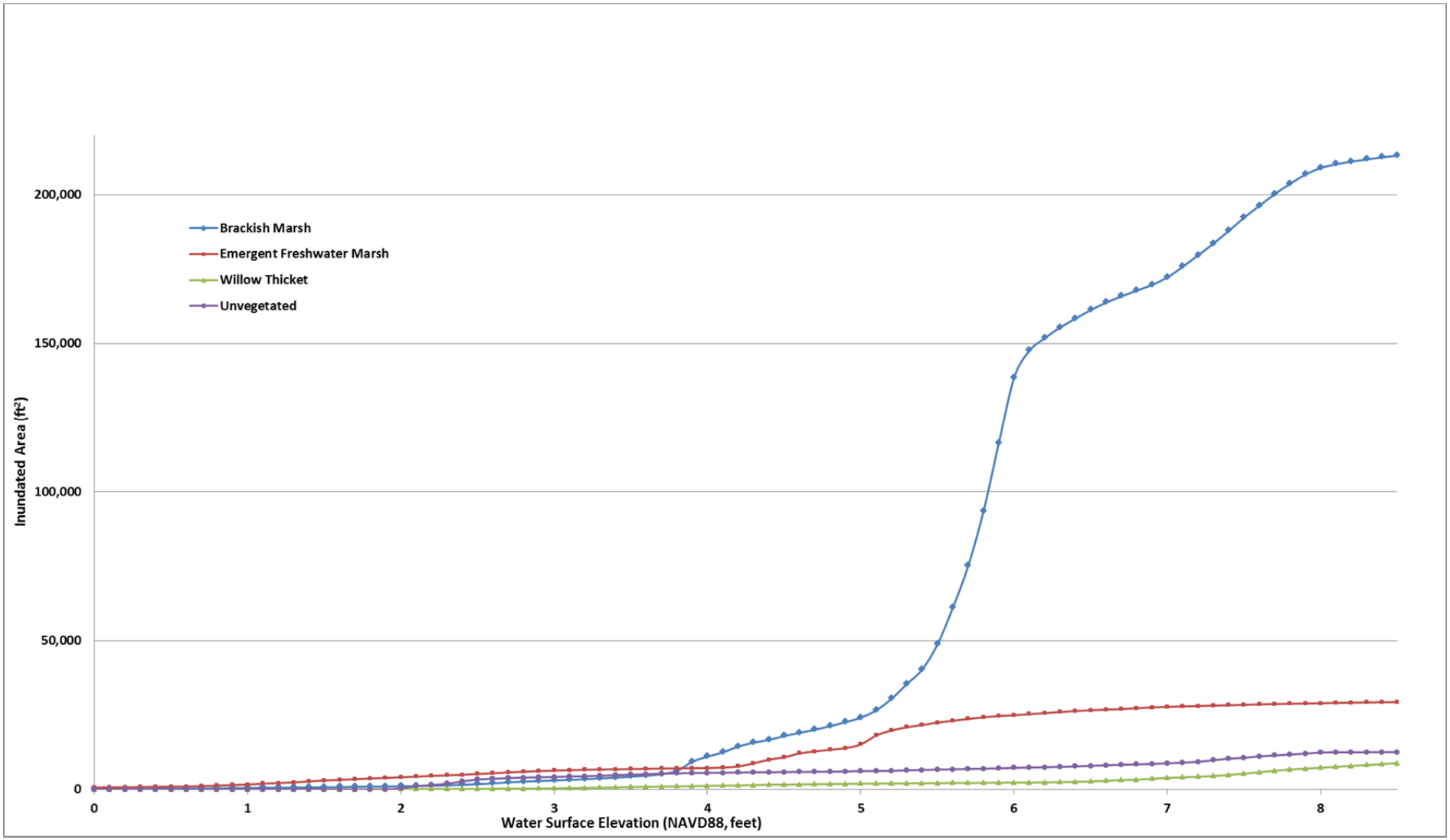


Figure 8. Inundated vegetated habitat in Goleta Slough.

Breaching the sandbar would also indirectly affect steelhead by altering water quality in the slough. The precise effect of an open bar on water quality is not well known in Goleta Slough, but it can be expected that higher salinity and lower water temperatures would occur. Based on the examination of water quality data collected in 2014 (Rincon et al. 2015), conditions for steelhead tended to be suitable during winter and spring regardless of whether the sandbar was open or closed, and unsuitable during summer regardless of sandbar closure. Therefore other factors appear to have more influence on water quality and habitat suitability in the slough than the sandbar closure status.

Sand bar breaching resulting in an open slough is a natural process, typically occurring during the wet season (approximately November through March). Adult steelhead are adapted to migrate upstream into tributaries, and smolts are adapted to migrate downstream to the ocean during the wet season when precipitation and runoff are greatest and sand bars are open. Under the Proposed Action, steelhead would be provided migration opportunities each winter during the tidally fluctuating conditions that follow a sandbar breach. Since the breaching would occur during a precipitation event, it is likely that it would coincide with increased flows in tributaries to support adult upstream migration. As noted in the Southern California Steelhead Recovery Plan (NMFS 2012), when sandbar barriers fail to breach, there is an impact on migrating adults and smolts. In addition to the lost migration opportunities, the closed sandbar may even force a higher proportion of fish to adopt a freshwater maturation strategy rather than an anadromous strategy (Jacobs et al. 2011). NMFS (2012) also notes that, "Since freshwater residents are significantly less fecund than steelhead, the resulting population would be less resilient to extirpation, and gene flow among populations by straying steelhead would also be reduced. All these outcomes would tend to reduce the capacity of *O. mykiss* populations to recover from and adapt to changing conditions." By ensuring at least one breach and open slough condition per year, the Proposed Action would improve steelhead migration opportunities, and thus potentially the long-term resiliency of the population.

Reducing WSE during the dry season using siphons or pumps could have an indirect effect on steelhead by reducing available habitat and altering water quality and habitat suitability for steelhead. However, based on water quality in Goleta Slough measured in 2014 (Section 5.1.2), steelhead would be unlikely to rear in the slough during summer due to high water temperatures and high salinity. Thus, if conditions do not support steelhead rearing within the slough during the dry season, the risk of steelhead being indirectly affected by siphons or pumping is negligible.

7.1.3 Cumulative Effects

For the purposes of this BA, cumulative effects are considered those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area and are unrelated to the action. A list of current projects within the watershed is appended (Appendix B). The majority of these are development projects not expected to directly affect Goleta Slough.

Cumulative effects on steelhead may occur as a result of other ongoing or planned actions in or near the Action Area. In particular, any actions that affect habitat suitability for steelhead in the

slough, such as restoration efforts, addressing fish passage barriers, or increased freshwater inflow, could have a cumulative, beneficial effect on steelhead.

In addition, ongoing and planned actions that could affect sandbar dynamics could result in a cumulative effect on steelhead. For example, efforts by the County to add sand to Goleta Beach as beach nourishment would likely result in the sand bar closing sooner than it would otherwise, resulting in more frequent breach or siphon pumping under the Proposed Action, with associated stranding risk and decrease in suitable habitat.

7.1.4 Critical Habitat

Critical habitat for the southern California steelhead DPS has been designated within the Goleta Slough complex. When designating critical habitat, NMFS considers certain habitat features called "Primary Constituent Elements" (PCEs) that are essential to support one or more life history stage(s) of the listed species (50 CFR 424.12b). PCEs considered essential for the conservation of the Southern California Steelhead DPS are those sites and habitat components that support one or more life stages and contain physical or biological features essential to survival, growth, and reproduction. PCEs that are present within Goleta Slough include "estuarine areas that provide uncontaminated water and substrates; food and nutrient sources to support growth and development; and connected shallow water areas and wetlands to conceal and shelter juveniles. Estuarine areas include coastal lagoons that are seasonally stable, predominantly freshwater flooded habitats that remain disconnected from the marine environment except during high streamflow events, and tidally influenced estuaries that provide a dynamic shallow water environment."

The Proposed Action has the potential to affect these PCEs within Goleta Slough. By allowing the slough to form a sandbar naturally during the spring, the Proposed Action would support and not adversely modify coastal lagoon habitat that is seasonally stable and predominantly freshwater habitat that is disconnected from the marine environment until sandbar breaching occurs. In addition, a managed breach during the wet season under the Proposed Action would provide and not adversely modify tidally influenced estuary habitat with a dynamic shallow water environment. Overall, the Proposed Action would maintain or enhance and not adversely modify these critical habitat PCEs for the southern California steelhead DPS.

7.2 TIDEWATER GOBY

7.2.1 Direct Effects

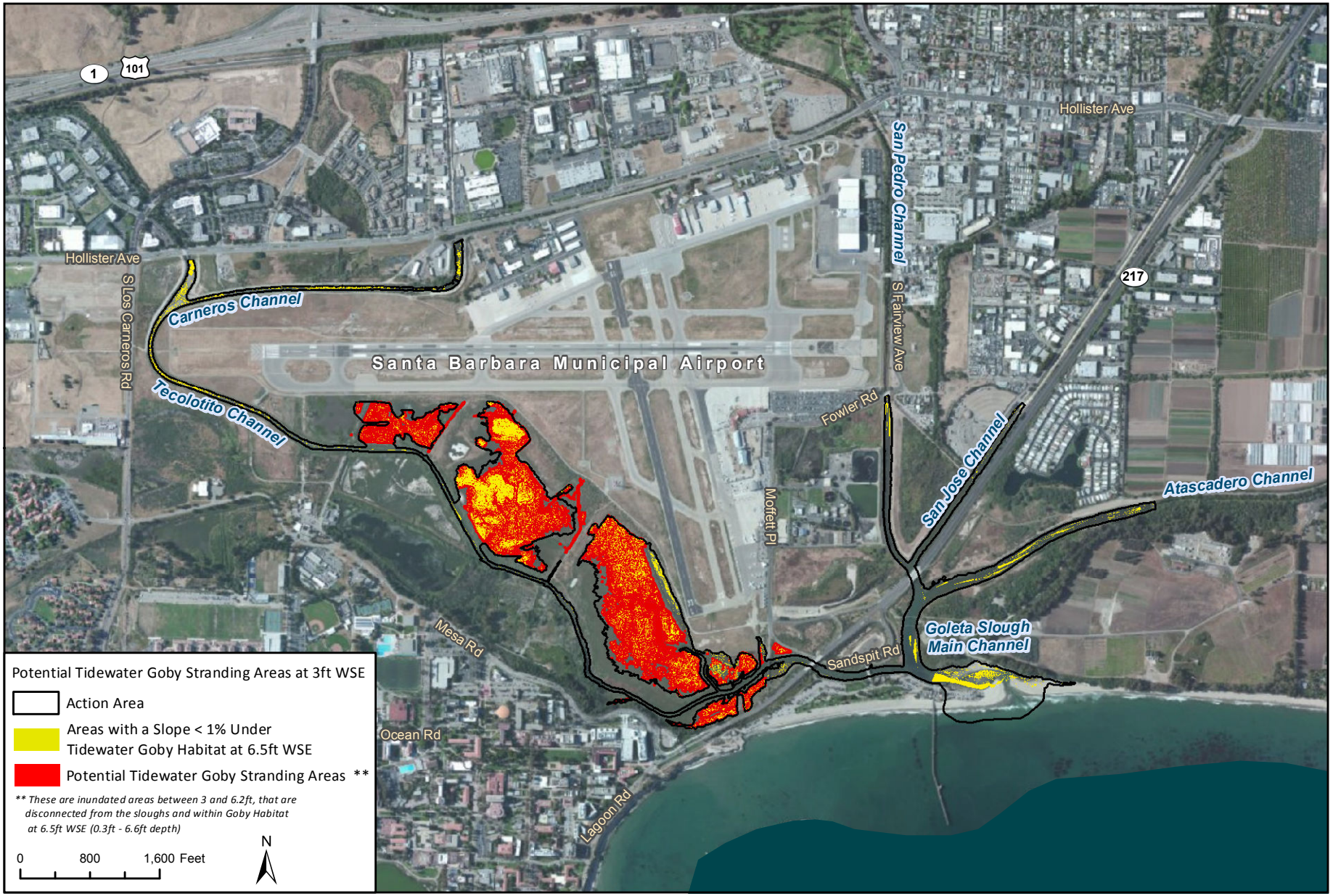
Under the Proposed Action, managed breaches of the Goleta Slough sandbar are likely to occur during most years. Breaches are anticipated to occur during fall or winter, which also coincides with the presence of primarily adult life stages of tidewater goby within the slough (Section 5.2.1). When a breach occurs the WSE of the slough will likely drop rapidly, potentially "flushing" adult tidewater gobies into the ocean (Swenson 1997), or potentially stranding individuals within flat areas or isolated pools. For instance, in the Santa Clara River Estuary an artificial breach event in September of 2010 resulted in mortality of "thousands" of tidewater gobies on exposed gravel bars (Cardno/Entrix 2010). Similar effects could result from a managed breach under the Proposed Action. Figure XX illustrates the areas that are vulnerable

to stranding if a breach event were to occur at an average tide (3 feet) when the slough was inundated to 6.5 feet. Around 20% of the available suitable tidewater goby habitat at 6.5 feet poses a risk of stranding. This is a conservative assessment (i.e., an overestimate) of potential stranding, since in the past managed breach events have very often been conducted at higher tides, which would have less potential to strand fish. For example, in December of 2014 an emergency breach event was conducted when the tide was at 6.2 feet. There are many areas within the wetland adjacent to the airport where tidewater gobies could become stranded in isolated pockets of water and vulnerable to predation (Figure 9). There are also a few areas in the lower mainstem channel and within tributary slough channels where slopes are less than 1% and a high risk of stranding could occur during a breach event. If multiple breaches were to occur within a year, each breach could potentially result in goby stranding. As described above for steelhead, based on the hydrological conditions observed in 2010 through 2014, ESA (2015) used a quantified conceptual model to predict that under "typical" conditions two or possibly three managed breach events could occur each year under the Proposed Action.

Tidewater goby spawning generally ends after sandbars are breached by fall and winter storms. After sandbars breach and physical and chemical conditions become less than ideal for tidewater goby breeding and rearing, abundance plummets, sometimes by several orders of magnitude, only to recover after bar closure during the late spring or early summer (Moyle 2002, Smith 1990, Swift et al. 1989). For example, in the Santa Clara River Estuary example discussed above, tidewater gobies were still abundant in the portions of the lagoon habitat that remained relatively unaffected during the breach (Cardno/Entrix 2010), and a similar dynamic would be anticipated to occur in Goleta Slough within all of the areas shown in Figure 9 that remain inundated at 3 feet elevation. Therefore, despite the potential for displacement ("flushing") following winter sandbar breaching, tidewater gobies have adapted to these natural environmental fluctuations and the species has shown resilience and an ability to recover from such events.

Under the Proposed Action, siphon pumping could occur during the dry season (typically July through September) of some years. ESA (2015) predicted that it is unlikely for water levels in Goleta Slough to exceed 6.5 feet during the summer months under typical conditions other than during extreme high tides or large wave events. It is possible that an unseasonably late rain event with a closed lagoon mouth could cause ponded water levels to exceed 6.5 feet. Under the Proposed Action, if water levels above 6.5 feet were to occur during the summer months, a siphon pump would be used to reduce the WSE to 5.0 feet. The direct effects of this reduction in WSE could be stranding of tidewater gobies in isolated pools, as described above for a breach action. Figure 10 illustrates the areas that are vulnerable to stranding during a siphon pumping event, if the slough were to be reduced from 6.5 feet to 5.0 feet. Around 20% of the available suitable tidewater goby habitat at 6.5 feet poses a risk of stranding. Although more suitable habitat would remain than during a complete breach, nearly all of the same areas would be vulnerable to stranding as during a complete breach, since most of the areas with stranding risk are between elevations of 6.5 feet and 5.0 feet (Figure 10).

The use of pumps to siphon water out of the slough under the Proposed Action could also potentially result in entrainment of tidewater goby in the siphon pump and subsequent displacement from suitable habitat or mortality. However, exclusion netting would be used to prevent entrainment with pumps (Section 2.1.2), and this is not considered a substantial risk.



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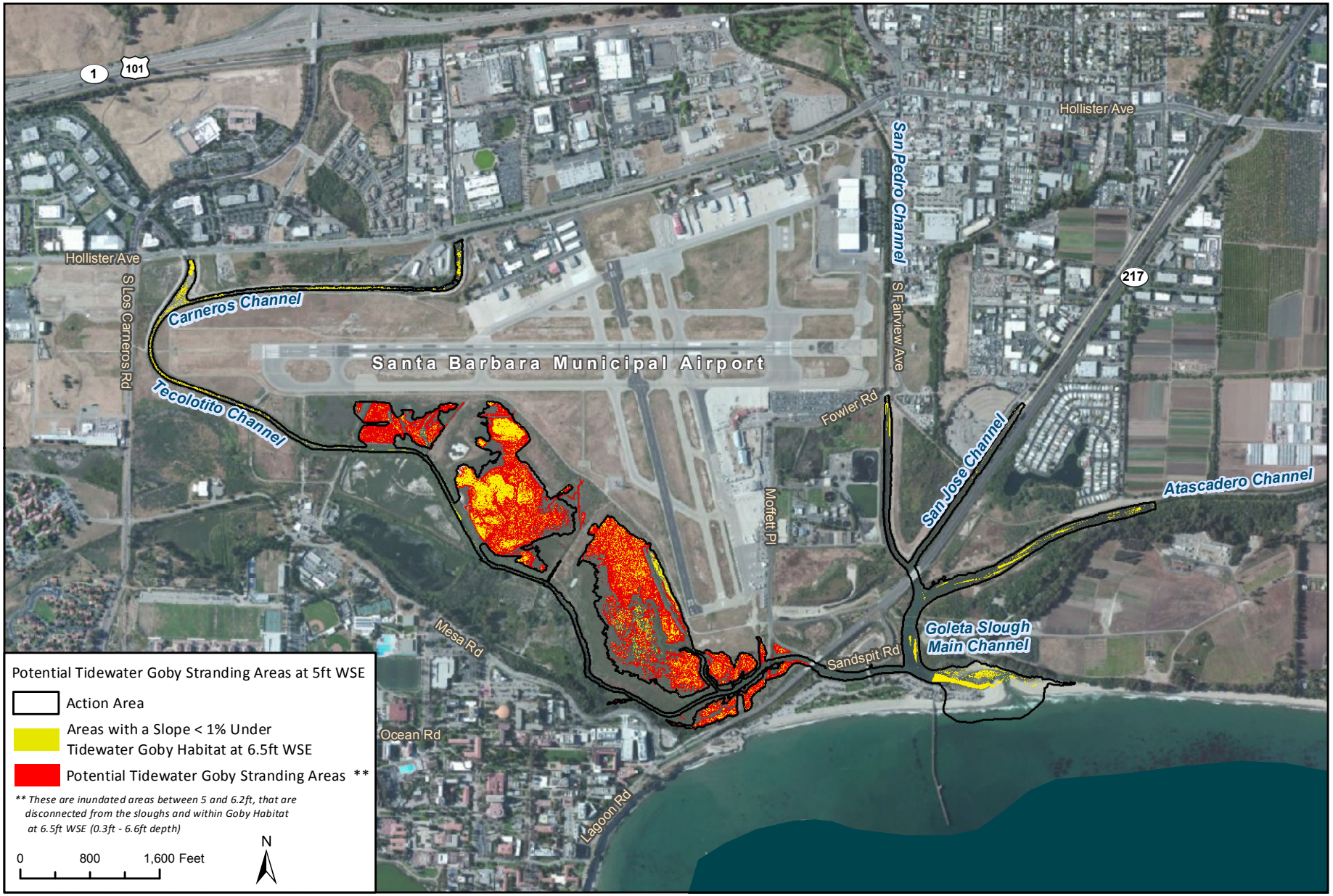
Potential Stranding Areas for Tidewater Goby (Breach)

Figure 9



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Potential Stranding Areas for Tidewater Goby (Pump/Siphon)

Figure 10

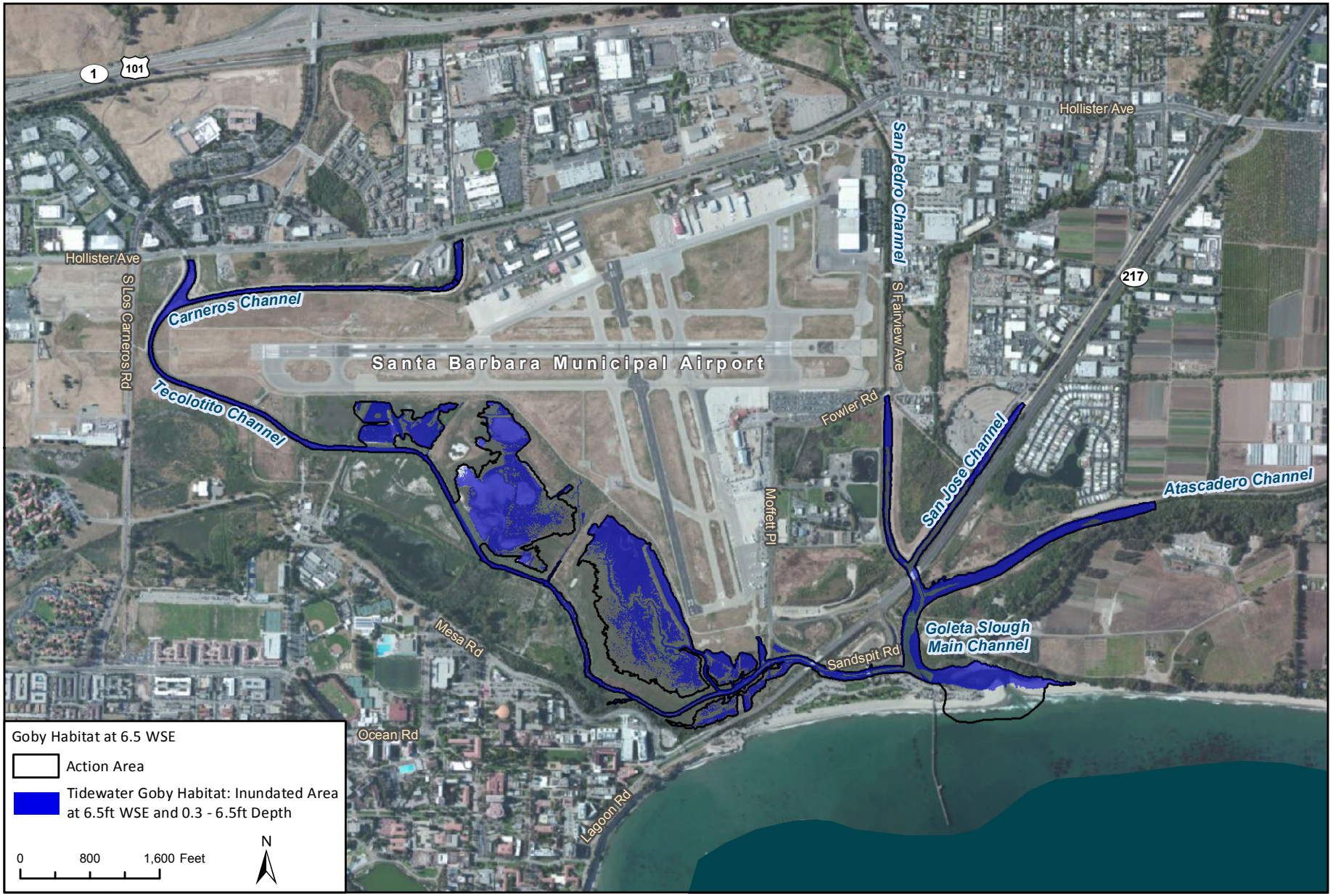
7.2.2 Indirect Effects

In addition to the potential direct effects described above, the Proposed Action could have indirect effects on tidewater goby. At a WSE of 6.5 feet, suitable habitat for all life stages of tidewater goby would occur throughout the slough (Figure 11). Following a breach, the amount of stable, inundated habitat would be reduced. Some of these areas would still be accessible depending on the tide, but the suitability would decrease with fluctuating WSE. The potential breach elevation under natural conditions can vary considerably depending on the season, the duration since a previous breach, wave action, and the rate of inflow from tributary watersheds (ESA 2015). Although data on breaches at Goleta Slough are lacking, historically breaches from County management actions to maintain an open slough mouth occurred at WSEs between 4.4 and 6.8 feet, most typically at WSE less than 6 feet: previous breaches were not conducted according to specific water height criteria. Recent breaches from City management actions to protect infrastructure from flooding occurred at WSEs of up to 8.5 feet (ESA 2015); however, a WSE at 10.0 feet is typically required for a natural breach to actually occur (ESA 2015) which is 1.0 foot greater than the WSE at which the airport and surrounding areas experience flooding. Breaching the slough when the WSE in the slough is 6.5 feet rather than 8.5 feet would result in a 31% decrease in stable (non-fluctuating) suitable tidewater goby rearing habitat.

Much of what constitutes suitable habitat for tidewater goby is inundated vegetation, mostly at elevations greater than around 4.5 feet (Figure 11). As described above, although an increase in WSE inundates more vegetation and increases the amount of suitable habitat, the development of these plant communities could not occur if they were continuously inundated, with the exception of the emergent freshwater marsh community. Therefore breaching the sandbar has the indirect effect of reducing available habitat for tidewater goby in the short-term, while simultaneously supporting a natural process that creates suitable habitat for tidewater goby in the long-term.

Breaching the sandbar would also indirectly affect tidewater goby by altering water quality in the slough. The precise effect of an open bar on water quality is not well known in Goleta Slough, but available data support the conclusion that higher salinity and lower water temperatures would occur when the bar is open. Reductions in water temperature following a breach would benefit tidewater goby. However, salinity of seawater is around 35 ppt, greater than the salinity preferences of tidewater goby (< 15 ppt), which could result in tidewater gobies migrating upstream into slough channels to areas with lower salinities. Based on the examination of water quality data collected in 2014 (Rincon et al. 2015), conditions for tidewater goby tended to be suitable during winter and spring regardless of whether the bar was open or closed, and unsuitable during summer regardless of sandbar closure. Therefore other factors appear to have more influence on water quality and habitat suitability in the slough than the sandbar closure status.

Reducing WSE during the dry season using siphons or pumps could have an indirect effect on tidewater goby by reducing available habitat. Reducing the WSE from 6.5 feet to 5.0 feet would reduce the total available habitat for tidewater goby by 66% (Figure 12). At a WSE of 5.0 feet there is still abundant suitable tidewater goby habitat available, including within the main and tributary channels, and areas with inundated vegetation (Figure 12).



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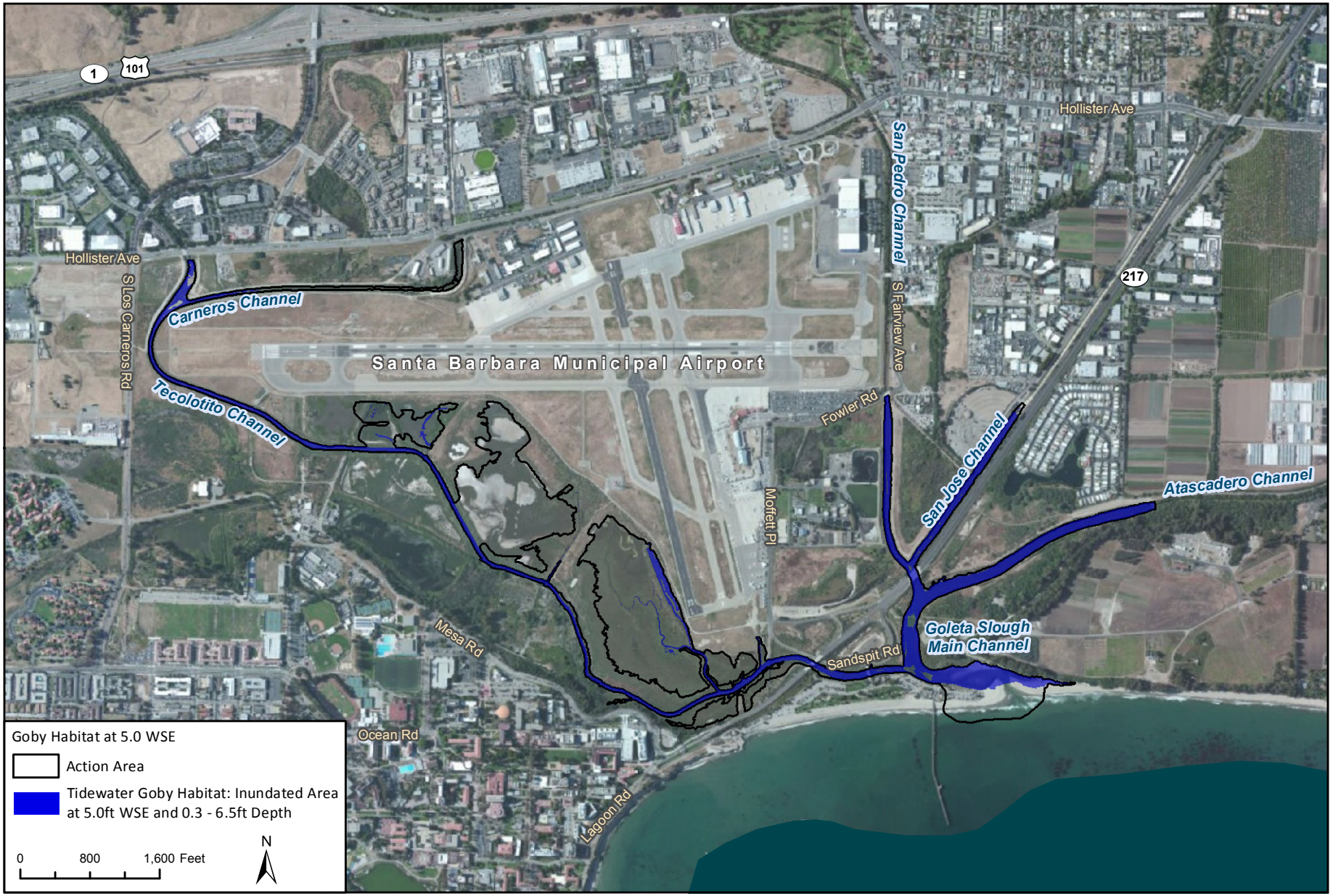
Indirect Effects Analysis on Suitable Habitat for Tidewater Goby, 0.3 to 6.5 ft SWE

Figure 11



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Indirect Effects Analysis on Suitable Habitat for Tidewater Goby, 0.3 to 5 ft SWE

Figure 12

7.2.3 Cumulative Effects

For the purposes of this BA, cumulative effects are considered those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area and are unrelated to the action. A list of current projects within the watershed is appended (Appendix B). The majority of these are development projects not expected to directly affect Goleta Slough. Cumulative effects on tidewater goby may occur as a result of other ongoing or planned actions in or near the Action Area. In particular, any actions that affect habitat suitability for tidewater goby in the slough, such as wetland restoration efforts or increased freshwater inflow, could have a cumulative, beneficial effect on tidewater goby by improving available habitat quantity and suitability.

In addition, ongoing and planned actions that could affect sandbar dynamics could result in a cumulative effect on tidewater goby. For example, efforts by the County to add sand to Goleta Beach as beach nourishment would likely result in the sand bar closing sooner than it would otherwise, resulting in more frequent breach or siphon pumping under the Proposed Action. The effects of increased frequency of managed breaches could be deleterious for tidewater goby by increasing probability of displacement during the breach, stranding risk, and reducing stable rearing habitat.

7.2.4 Critical Habitat

Critical habitat for tidewater goby has been designated within Goleta Slough (U.S. Fish and Wildlife Service 2013). When designating critical habitat, U.S. Fish and Wildlife Service considers certain habitat features called "Primary Constituent Elements" (PCEs) that are essential to support one or more life history stage(s) of the listed species. The primary constituent element (PCE) specific to the tidewater goby is: (1) Persistent, shallow (in the range of approximately 0.3 to 6.6 feet (0.1 to 2.0 meters)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following: (a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; (b) Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus, Ruppia maritima, Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or (c) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

The Proposed Action has the potential to affect these designated PCEs. Persistent, shallow, slow-moving lagoon habitat (PCE 1) will be supported and not adversely modify by allowing the sandbar to form naturally during spring or summer as occurs under existing conditions, although the quantity and quality of this habitat will be somewhat reduced by the proposed siphon pumping action during the dry season, as well as by breaching the sandbar during the wet season. The PCE specific to habitat that contains submerged and emergent aquatic vegetation (PCE 1b) will be supported and not adversely modify by allowing the slough to fill to elevations greater than 4.5 feet prior to any siphon or breach actions, and also by the managed breach creating tidal conditions that allow the development and maintenance of these plant communities that could not occur if they were continuously inundated. In addition, the

PCE specific to the presence of a sandbar that closes during the late spring, summer, and fall (PCE 1c) would be supported and not adversely modify under the Proposed Action because the sandbar would be allowed to form naturally, with any managed breach action occurring only in the winter wet season.

8.0 EFFECTS DETERMINATION

This discussion provides a Section 7 finding for proposed or listed species and proposed or designated critical habitat that may be present in the Action Area should the Proposed Action be implemented.

8.1 SOUTHERN CALIFORNIA COAST STEELHEAD DPS AND CRITICAL HABITAT

There are aspects of the Proposed Action that would have a beneficial effect on the southern California coast steelhead DPS and designated critical habitat. These include certainty of migration opportunities for adult and smolt life stage steelhead occurring during precipitation events, and the maintenance of functioning estuary habitat. By ensuring at least one breach and open slough condition per year, the Proposed Action would have the direct effect of improving steelhead migration opportunities, and thus potentially the long-term resiliency of the steelhead population. In addition, a managed breach ensures Goleta Slough persists as a seasonal tidal estuary ecosystem, protecting PCEs of critical habitat.

However, there are also aspects of the Proposed Action that ***may affect, and are likely to adversely affect*** the southern California coast steelhead DPS and critical habitat. These include the potential for juvenile steelhead stranding to occur during managed breach events (Section 7.1.1). In addition, there would be a reduction of stable, non-fluctuating habitat by conducting the breach at 6.5 feet, rather than allowing the slough to potentially breach naturally at a higher elevation (Section 7.1.2). The reduction of stable, non-fluctuating habitat would adversely modify this PCE of designated critical habitat for steelhead.

8.2 TIDEWATER GOBY AND CRITICAL HABITAT

There are aspects of the Proposed Action that would have a beneficial effect on tidewater goby and designated critical habitat. These include the maintenance of functioning and stable estuary habitat, which will protect PCEs of tidewater goby critical habitat.

However, there are also aspects of the Proposed Action that ***may affect, and are likely to adversely affect*** tidewater goby and designated critical habitat. These include the potential for adult tidewater goby stranding to occur during managed breach events and siphon pumping (Section 7.2.1). In addition, there would be a reduction of stable, non-fluctuating habitat by conducting the breach at 6.5 feet, rather than allowing the slough to potentially breach naturally at a higher elevation (Section 7.2.2). The reduction of stable, non-fluctuating habitat would adversely modify this PCE of designated critical habitat for the tidewater goby.

9.0 CONSERVATION MEASURES

9.1 SOUTHERN CALIFORNIA COAST STEELHEAD DPS

Aspects of the Proposed Action have the potential to impact the southern California coast steelhead DPS and designated critical habitat, as described above. However, many components of the Proposed Action have been designed with the intention of benefiting the DPS and critical habitat, or at least minimizing impacts. These include:

- Timing managed breaches to coincide with steelhead migratory periods, and precipitation events. This is intended to mimic a natural breach pattern to optimize the potential for adults to enter the slough and tributaries during a breach event, and for smolts to migrate downstream from tributaries to the ocean.
- Avoiding breaching during summer or fall. This is intended to avoid breaching when the slough is filling, potentially providing stable rearing habitat for juvenile steelhead during a non-migratory period.
- Breaching only after the slough has reached the highest WSE feasible (6.5 feet). This is intended to maximize available rearing habitat for juvenile steelhead without threatening terrestrial resources or increasing bird strike hazards.
- Providing the natural functions of a seasonal tidal estuary, including an open bar during the wet season and a closed bar during the dry season. This is intended to support tidal ecosystem function during the wet season (including the development of brackish saltwater marsh vegetation), as well as stable non-fluctuating habitat during the dry season.
- Conducting siphon pumping with a slow (<1.5 inches per day) rate of withdrawal to allow steelhead to actively avoid stranding.
- Using exclusion netting to prevent steelhead from being entrained in siphon pumps.
- Maintaining a WSE in the slough during siphon pumping of at least 5.0 feet to maintain suitable steelhead rearing habitat.

In addition to the Proposed Action, conservation measures are proposed to further minimize potential adverse effects of the Proposed Action on the southern California coast steelhead DPS and designated critical habitat, including:

1. Based on the analysis of existing conditions in Goleta Slough, there are key environmental variables that are closely correlated with steelhead habitat suitability. These include WSE, water temperature, salinity, and DO. Continuous monitoring of these variables will be conducted to assess the influence of the Proposed Action on habitat suitability for steelhead, including conditions during both open bar and closed bar conditions.
2. Monitoring for the presence and distribution of steelhead will be conducted to assess the influence of the Proposed Action. A quarterly assessment of the presence/absence and/or distribution of steelhead within Goleta Slough will be conducted. If steelhead

are documented to occur, more precise seining efforts will be conducted to identify locations within the slough where rearing is occurring, estimate relative abundance, and assess population status.

3. Areas with a high risk of steelhead stranding identified in Figure 6 will be monitored during managed breaches. This will allow estimates of the impacts of the Proposed Action to be enumerated and facilitate rescue of any stranded steelhead.
4. Conduct managed breaches at high tide (> 3.0 feet). This will minimize stranding risk for steelhead by reducing the maximum drop in WSE that can occur during a breach event.
5. Monitor adult and smolt migrations during managed breach events. DIDSON cameras, spawning surveys to detect anadromous adult migration, fyke traps, or other appropriate methods will be used to monitor adult and smolt steelhead migration during managed breach events.
6. Restoration to increase suitable steelhead rearing habitat.

9.2 TIDEWATER GOBY

Aspects of the Proposed Action have the potential to impact tidewater goby and designated critical habitat, as described above. However, many components of the Proposed Action have been designed with the intention of benefiting tidewater goby and critical habitat, or at least minimizing impacts. These include:

- Avoiding breaching the sandbar during summer or fall. This is intended to avoid breaching when the slough is filling, potentially providing stable habitat for tidewater goby during their spawning and juvenile rearing period.
- Breaching only after the slough has reached the highest WSE feasible (6.5 feet). This is intended to maximize available rearing habitat for tidewater goby without threatening terrestrial resources or increasing bird strike hazards.
- Providing the natural functions of a seasonal tidal estuary, including an open bar during the wet season and a closed bar during the dry season. This is intended to support tidal ecosystem function during the wet season (including the development of brackish saltwater marsh vegetation), as well as stable non-fluctuating habitat during the dry season.
- Use of siphon pumping to reduce WSEs during the dry season without the need for a managed breach. A breach during the dry season would potentially displace or strand tidewater goby during their sensitive spawning and juvenile rearing period.
- Conducting siphon pumping with a slow (<1.5 inches per day) rate of withdrawal to allow tidewater gobies to actively avoid stranding.
- Using exclusion netting to prevent tidewater gobies from being entrained in siphon pumps.
- Maintaining a WSE in the slough during siphon pumping of at least 5.0 feet to maintain suitable tidewater goby rearing habitat.

In addition to the Proposed Action, conservation measures are proposed to further minimize the effects of the Proposed Action on tidewater goby and designated critical habitat, including:

1. Based on the analysis of existing conditions in Goleta Slough, there are key environmental variables that are closely correlated with tidewater goby habitat suitability. These include WSE, water temperature, and salinity. Continuous monitoring of these variables will be conducted to assess the influence of the Proposed Action on habitat suitability for tidewater goby, including conditions during both open bar and closed bar situations.
2. Monitoring for the presence and distribution of tidewater goby will be conducted to assess the influence of the Proposed Action. A quarterly assessment of the presence/absence and/or distribution of tidewater goby within Goleta Slough will be conducted. The use of environmental DNA techniques will be used to determine presence of tidewater goby within the slough, but will not provide detailed information on relative abundance or distribution. When tidewater goby are documented to occur, more precise seining efforts will be conducted to document locations within the slough where rearing is occurring, relative abundance, and assess population status.
3. Areas with a high risk of tidewater goby stranding identified in Figure 9 will be monitored during managed breaches. This will allow estimates of the impacts of the Proposed Action to be enumerated, and facilitate rescue of any stranded gobies.
4. Conduct managed breaches at high tide (> 3.0 feet). This will minimize stranding risk for tidewater gobies by reducing the maximum drop in WSE that can occur during a breach event.
5. Areas with a high risk of tidewater goby being stranded in isolated pools identified in Figure 10 will be monitored during siphon pumping events. This will allow verification of the slow drawdown, and estimates of the impacts of the direct effects of the Proposed Action to be documented and enumerated (if they occur).
6. Restoration to increase suitable tidewater goby rearing habitat.

10.0 REFERENCES AND PREPARERS

10.1 REFERENCES

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Appendix A

Regulatory Guidance

REGULATORY SETTING

Special-status habitats are vegetation types, associations, or sub-associations that support concentrations of special-status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife.

Listed species are those taxa that are formally listed as endangered or threatened by the federal government (e.g. U.S. Fish and Wildlife Service [USFWS]), pursuant to the Federal Endangered Species Act (FESA) or as endangered, threatened, or rare (for plants only) by the State of California (i.e. California Fish and Game Commission), pursuant to the California Endangered Species Act or the California Native Plant Protection Act. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g. Audubon Society, CNPS, The Wildlife Society), and the scientific community.

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States);
- Regional Water Quality Control Board (waters of the State);
- U.S. Fish and Wildlife Service (federally listed species and migratory birds);
- California Department Fish and Wildlife (riparian areas and other waters of the State, state-listed species);

U.S. Army Corps of Engineers. Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) has authority to regulate activities that could discharge fill of material or otherwise adversely modify wetlands or other "waters of the United States." Perennial and intermittent creeks are considered waters of the United States if they are hydrologically connected to other jurisdictional waters. The USACE also implements the federal policy embodied in Executive Order 11990, which is intended to result in no net loss of wetland value or acres. In achieving the goals of the Clean Water Act, the USACE seeks to avoid adverse impacts and offset unavoidable adverse impacts on existing aquatic resources. Any fill or adverse modification of wetlands that are hydrologically connected to jurisdictional waters would require a permit from the USACE prior to the start of work. Typically, when a project involves impacts to waters of the United States, the goal of no net loss of wetland acres or values is met through compensatory mitigation involving creation or enhancement of similar habitats.

Regional Water Quality Control Board. The State Water Resources Control Board (SWRCB) and the local Central Coast Regional Water Quality Control Board (RWQCB) have jurisdiction over "waters of the State," pursuant to the Porter-Cologne Water Quality Control Act, which are defined as any surface water or groundwater, including saline waters, within the boundaries of the State. The SWRCB has issued general Waste Discharge Requirements (WDRs) regarding discharges to "isolated" waters of the State (Water Quality Order No. 2004-0004-DWQ, Statewide General Waste Discharge Requirements for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction). The

Central Coast RWQCB enforces actions under this general order for isolated waters not subject to federal jurisdiction, and is also responsible for the issuance of water quality certifications pursuant to Section 401 of the Clean Water Act for waters subject to federal jurisdiction.

United States Fish and Wildlife Service and National Marine Fisheries Service. The USFWS implements the Migratory Bird Treaty Act (16 United States Code [USC] Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668). The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the Federal Endangered Species Act (FESA) (16 USC § 153 et seq.). The USFWS generally implements the FESA for terrestrial and freshwater species, while the NMFS implements the FESA for marine and anadromous species. Projects that would result in "take" of any federally listed threatened or endangered species are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of FESA, depending on the involvement by the federal government in permitting and/or funding of the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of FESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

California Department of Fish and Wildlife. The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California. The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened, endangered or fully protected species. Take under CESA is restricted to direct mortality of a listed species and does not prohibit indirect harm by way of habitat modification. The CDFW also prohibits take for species designated as Fully Protected under the Code.

California Fish and Game Code sections 3503, 3503.5, and 3511 describe unlawful take, possession, or destruction of birds, nests, and eggs. Fully protected birds (Section 3511) may not be taken or possessed except under specific permit. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs.

Species of Special Concern (SSC) is a category used by the CDFW for those species which are considered to be indicators of regional habitat changes or are considered to be potential future protected species. Species of Special Concern do not have any special legal status except that which may be afforded by the Fish and Game Code as noted above. The SSC category is intended by the CDFW for use as a management tool to include these species into special consideration when decisions are made concerning the development of natural lands. The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare. Under Section 1913(c) of the NPPA, the owner of land where a rare or endangered native plant is growing is required to notify the department at least 10 days in advance of changing the land use to allow for salvage of plant.

Perennial and intermittent streams and associated riparian vegetation, when present, also fall under the jurisdiction of the CDFW. Section 1600 et seq. of the Fish and Game Code (Lake and Streambed Alteration Agreements) gives the CDFW regulatory authority over work within the stream zone (which could extend to the 100-year flood plain) consisting of, but not limited to, the diversion or obstruction of the natural flow or changes in the channel, bed, or bank of any river, stream or lake.

Appendix B

Project List for Cumulative Project Analysis

CUMULATIVE PROJECTS LIST

Projects near Action Area and/or Potentially Affecting Aquatic Features in the Watershed highlighted in grey.

1. County of Santa Barbara: Projects in the Goleta Community Plan (May include some outside the watershed)

Cumulative project list, updated 2/19/2015

http://www.arcgis.com/home/webmap/viewer.html?webmap=d698df33cab9440893d958de824a76ac&extent=-120.7546,34.0928,-119.1986,35.4767

Excludes CEQA exempt, ministerial, one lot splits, one SFD, and IV and UCSB since not in watershed. Unincorporated Goleta Plan area units and SF total build out also available

Project	Address	APN	Land Use	Acreage	Project Description	Status
PROJECTS UNDER CONSTRUCTION						
Preserve at San Marcos	Atascadero Creek Watershed	055-010-006 055-010-007	Residential		Subdivision of a 377 acre parcel into 200 acres of preserved land, 15 single-family dwelling units (SFDUs), 5 affordable multi-family units, and a 10 acre public park.	Under construction
Las Vegas – San Pedro Creeks Capacity Improvement Project	On Route 101 in Santa Barbara County Post mile 22.3-23.2		Infrastructure		The Santa Barbara County Flood Control District (CFCD) in partnership with Caltrans is completing hydraulic capacity improvements along Las Vegas and San Pedro Creeks under Calle Real, Route 101, and the Union Pacific Railroad (UPRR). The proposed project would increase the hydraulic capacity of the two creeks from a 10-year to a 25-year storm water event	Under construction
Flood Control Maintenance Activities in the Goleta Slough			Infrastructure		Plan for flood control maintenance activities in Goleta Slough and five creeks: Atascadero, San Jose, San Pedro, Los Carneros and Tecolotito. Plan includes dredging, stockpiling sediment, disposal of sediment, and enhancement of specific areas affected by flood control activities.	Ongoing (programmatic)

Project	Address	APN	Land Use	Acreage	Project Description	Status
PROJECTS Approved						
ANCHO DANZA DEL SOL LOT SPLIT		059-010-079	Commercial		Conditional Use Permit allowing boarding of a maximum of 15 horses on proposed Parcel 2 in an existing barn, six stalls and nine existing corrals, and construction of a 1,824 square foot caretaker's residence on a new septic system (912	Approved
HACIENDA VIEJA: TM 14,595		065-240-019	Residential		Subdivision of two parcels to create five lots. TM 14,595	Approved
CAVALETTO/NOEL HOUSING	Adjacent to San Jose Creek	069-100-006	Residential		Development of a residential community totaling 134 new homes (net 132) as follows: 24 attached units, apartments, town homes or condos or affordable housing, 30 triplex units, 43 detached courtyard homes, 26 SFDs in the Inner Village location	Approved
CIERVO FARMING CO LOT SPLIT TPM 14,771	Near san Jose Creek	069-020-006	Residential		Lot Split on Ag Land	Approved
HOURIGAN DEVELOPMENT PLAN	Adjacent to blue line creek	069-060-040	Residential		develop 6 new market rate residential units	Approved
The Knolls Subdivision		069-172-059	Residential		Division of 5.12 acres into 16 lots and 12 new SFDUs.	Approved
State Street Hospitality	Atascadero Creek Watershed	061-110-008 061-110-009	Commercial		88 room hotel with 43,758 sq. ft subterranean parking (94 spaces).	Approved
Castro Trust Lot Split	San Antonio Creek	059-440-020	Residential		The proposed project is for a Tentative Parcel Map to allow a Lot Split of a single 4.11-acre parcel, into four separate parcels of 1.0 acre, 1.04 acres, 1.03 acres, and 1.04 acres	Approved
Park Hill Estates V.2	San Antonio Creek watershed	059-290-041	Residential		Tract Map 14,768 to divide existing 14-acre parcel into 18 lots (16 residential lots and one open space lot) and construct infrastructure improvements (roads, utilities, etc.)	Approved

Project	Address	APN	Land Use	Acreage	Project Description	Status
Caird/Por La Mar Nursery Expansion		071-190-036	Agricultural		The subject property consists of 61.62 acres and is currently developed with 509,885 sf of greenhouse space as well as 21,902 sf of associated structures. Under the proposed project the existing greenhouses and supporting facilities would be removed and replaced with 1,393,570 sf of new greenhouse space, appx. 95,000 sf of new support facilities, and six employee units.	Approved
Rose/Cal-Orchid Greenhouses		065-290-026	Agricultural		Construction of 39,279 sf of new agricultural of roofed greenhouses, shade houses, and a gazebo.	

Project	Address	APN	Land Use	Acreage	Project Description	Status
PROJECTS pending						
Pasquinelli Lot Split		063-150-008			Division of 16.5 acres into 3 parcels of 4.0, 4.4, and 8.1 acres.	Pending
BLICKLEY LOT SPLIT		059-440-012 059-440-014			3 new lots	Pending
Goleta Community Plan Update	Unincorporated Goleta Valley				The Plan update amends the text and maps regulating land use in the Goleta Valley Community Plan for the Eastern Goleta Valley, the County Comprehensive Plan, and Local Coastal Plan, including new and revised narrative, goals, policies, development standards, and actions intended to regulate and guide future development and improvements exclusively in the Eastern Goleta Valley.	Pending (programmatic)
Goleta Beach 2.0	Goleta Beach				The proposed project serves to protect facilities at the heavily used park by permanently retaining approximately 1,200 linear feet of existing buried rock revetments.	Pending (CCC)

Project	Address	APN	Land Use	Acreage	Project Description	Status
Southern California Gas La Goleta Storage Field Enhancement Project	1171 More Ranch Road, Adjacent to Atascadero Creek				Extraction of native natural gas from previously untapped deep reservoirs and conversion of depleted wells to additional storage use. Project includes two wells drilled into known gas reserves, two exploratory wells drilled into prospective reserves, and construction of 2,800 feet of underground pipeline and a dehydration unit at the La Goleta Storage Field.	Pending (CCC)

2. City of Goleta

All projects in the City boundary, provided by the City
Revised 2/23/15

Project	Address	APN	Land Use	Acreage	Project Description	Status
PROJECTS UNDER CONSTRUCTION						
Haskell's Landing (The Hideaway)	Hollister Avenue & Las Armas Road	079-210-049	Residential	14.23	101 residential units	Under construction
Goleta Valley Cottage Hospital	351 S. Patterson at Hollister Avenue	065-090-022; -028	Commercial	18.38	Hospital 93,090 sf Existing; 152,658 sf Approved; 59,568 sf Net New	Under construction
Cabrillo Business Park	6767 Hollister Avenue	073-450-005	Commercial	91.4	Business Park - New structures total 693,100 sf (R&D, self storage, service uses); 241,682 sf existing Pre-Development Plan; 934,800 sf total; *Under Approved Projects (Not Constructed), see Discovery Self-Storage Case No.14-009-PCR, -LM and Pacific Beverage Case No. 14-070-PCR, -LLA, -OSP	Under construction
Westar	7000 Hollister Avenue (N/E corner of Glen Annie Road and Hollister)	073-030-020; -021	Residential/Commercial	23.55	266 residential units; Approx. 90,000 sf of commercial	Under construction
GVCH Medical Office Building Reconstruction	5333 Hollister Avenue	065-090-023	Commercial	2.17	Medical Office Building Demo Existing 41,224 sf; 52,000 sf Approved; 10,776 sf Net New	Under construction
Camino Real Marketplace Ice in Paradise	Santa Felicia Drive	073-440-022	Commercial	4.8	46,479 sf ice skating rink	Under construction
Los Carneros Overhead Bridge Replacement	101 and Los Carneros Road		Infrastructure		Replace the current bridge over the railroad; upgrade the structure to improve safety and traffic flow, add bike and pedestrian features.	Under construction

Project	Address	APN	Land Use	Acreage	Project Description	Status
Mesa Road Sewer Truck Project, GWSD	Mesa Road, UCSB. The project site and surrounding area are located within the Goleta Slough Ecosystem Management Plan (GSEMP) area.		Infrastructure		The proposed construction area for the new pipeline encompasses approximately 2.5 acres, including areas temporarily disturbed during construction. Approximately 2.8 acres of construction staging area would be fenced on the northwest corner of the Mesa Road and Los Carneros Road intersection.	Under construction
Robinson LLA-related lots	Baker, Violet and Daffodil Lanes	077-141-053; 077-141-070 et al	Residential	0.23-0.26 each lot	13 units	Approved; 9 of 13 units completed
APPROVED PROJECTS (NOT CONSTRUCTED)						
Ekwill-Fowler Road Extensions	Fowler Road and Ekwill Street		Infrastructure		Extensions of various sections of Fowler Road and Ekwill Street, roundabouts at Hollister Avenue, and Class I/II bike paths	Approved
Village at Los Carneros I and II	Los Carneros and US HWY 101	073-330-024 073-330-026 073-330-027 073-330-028 073-330-029	Residential	16	The Villages at Los Carneros I have been approved with 275 units on 16.11 acres. The proposed Villages at Los Carneros II will replace the LC-I approval with 465 units on 43.14 acres.	Pending
Islamic Society of SB	N/E Corner of Los Carneros and Calle Real	077-160-035	Commercial	0.59	6,183 sf building with prayer room, meeting area and 1 caretaker unit	Approved
Citrus Village	7388 Calle Real	077-490-043	Residential	1.02	10 residential units	Approved
Renco Encoders	26 Coromar Drive	073-150-013	Industrial	3.57	Existing M-RP Bldg (33,600 sf); Add 8,800 sf industrial space; Add 10,400 sf office	Approved
Mariposa at Ellwood Shores	7760 Hollister Avenue	079-210-057	Commercial	2.95	62,481 sf assisted living (90 residents)	Approved
Schwann Self Storage	10 S. Kellogg Avenue	071-090-082	Industrial	2.06	111,730 sf self-storage facility	Approved
Marriott Residence Inn	6300 Hollister Avenue	073-050-020	Commercial	10.57	80,989 sf hotel (118 rooms)	Approved
Cortona Apartments	6830 Cortona Drive	073-140-016	Residential	8.82	176 residential units	Approved

Project	Address	APN	Land Use	Acreage	Project Description	Status
Village at Los Carneros	Adjacent to 71 South Los Carneros Road	073-330-024, -026, -027, -028, -029	Residential	43.14	465 units on 43.14 acres	Approved
Rincon Palms Hotel	6868/6878 Hollister Avenue	073-140-004	Commercial	3.05	95,678 sf hotel; 138 rooms with meeting space	Approved
Harvest Hill Ranch	880 Cambridge Drive	069-620-044	Residential	4.73	7 lot subdivision with net of 6 homes	Approved
Somera Medical Office Building	454 S. Patterson Avenue	065-090-013	Commercial	8	20,000 sf net new medical/dental office building	Approved
Discovery Self-Storage Facility at CBP	350 Coromar Drive and 6640 Discovery Drive	073-610-015, -016	Commercial	6.02	111,100 sf self-storage facility (Note: Square footage is already included within the overall Cabrillo Business Park Scope)	Approved
Pacific Beverage at CBP	SW Corner of Coromar Drive and Discovery Drive	073-610-022, -023, -027, -029	Industrial	7.6	Includes a Lot Line Adjustment among 4 lots. On newly adjusted Lot 19, 2 new buildings will be constructed: a 93,780 sf office/warehouse building and a 3,200 sf truck maintenance/storage building.	Approved
PENDING PROJECTS						
Taylor Parcel Map	590 N. Kellogg Avenue	069-100-003	Residential	1.6	3 new units	Pending (On Hold)
Shelby	7400 Cathedral Oaks Road	077-530-019	Residential	13.92	60 residential units	Pending
Sturgeon Building	S/E Corner of Los Carneros and Calle Real	077-160-040	Commercial	0.53	6,046 sf retail/medical office	Pending (On Hold)
Kenwood Village	Calle Real w/o Calaveras Avenue	077-130-066, -019; 077-141-049	Residential	10	60 residential units	Pending
Target Store	6466 & 3470 Hollister Avenue and 170 Los Carneros Way	073-070-034; -035; 073-330-030	Commercial	11.35	120,690 sf net new grocery market (demo 44,110 sf; new building is 164,800 sf)	Pending
Saint George Mixed Use Project	5392 & 5400 Hollister Avenue	071-101-002; -015	Residential and Commercial	0.95	New 3-story mixed-use residential building; 4 new residential buildings with 2 units each.	Pending
Fairview Gardens	598 North Fairview Avenue	069-090-052	Agriculture	11.65	Farm Labor Camp Revision; Special Events Permit; and Sale of Ag related products grown offsite	Pending

Project	Address	APN	Land Use	Acreage	Project Description	Status
Taco Bell	7127 Hollister Avenue	073-440-012	Commercial	9.31 (parcel); 9.9 total shopping center	1,686 sf fast food restaurant with a drive-through facility	Pending
Fuel Depot with Car Washes	370 Storke Road	073-100-008	Commercial	1	1,667 sf new drive-in carwash, self-serve car wash, gas fueling dispensers and manager's residence; Zizzo's Coffee building to remain	Pending
Old Town Industrial Center	891 S. Kellogg Avenue	071-170-074, -080, -083	Industrial	14.76	186,770 sf new Light Industrial with outdoor storage and 5,100 sf office building	Pending
Old Town Village	South Kellogg Avenue	071-130-023	Commercial	12.31	Mixed Use of 175 townhomes with shopkeeper and livework units	Pending
Heritage Ridge	North of Calle Koral and West of Los Carneros	073-060-031 thru -043	Residential	16.2	228 residential apartments and 132 senior apartments	Pending
San Jose Creek Bike Path – Southern Extent	San Jose Creek along Highway 217		Infrastructure		Construction of a Class I/Class II bike path adjacent to San Jose Creek, from Hollister Avenue to the Atascadero Creek Bikeway at Goleta Beach	

3. City of Santa Barbara

From Goleta Beach 2.0 and GCP EIR

From Oct 2014 GCP

Cumulative Project List - Major Projects

Project	Address	APN	Land Use	Acreage	Project Description	Status
PROJECTS UNDER CONSTRUCTION						
PROJECTS Approved						
Santa Barbara Airport Master Plan	City of Santa Barbara	073-450-003			The Airport Master Plan provides guidelines for overall development, maintenance, and operation for the next 20 years. The plan evaluates the airport's capabilities and role, reviews forecasts of future aviation demand, and plans for the timely improvement of facilities that may best meet that demand and maintain compatibility with the environs.	Programmatic: Approved and Ongoing
PROJECTS pending						
Goleta Slough Mouth Breaching	Goleta Slough mouth				Permit application by City of Santa Barbara to resume mechanical breaching of Goleta Slough mouth as necessary to decrease water levels within the Slough and protect infrastructure such as Santa Barbara Airport.	Pending