
PART 4

GOALS, POLICIES AND ACTIONS

4.1 1997 GSEMP Goals, Policies and Actions

The 1997 *Goleta Slough Ecosystem Management Plan* included goals and policies that were derived from local policy documents including the City of Santa Barbara's Airport/Goleta Slough Local Coastal Plan (LCP), Santa Barbara County's LCP, the Goleta Valley Community Plan, and UCSB's 1992 Long Range Development Plan. Most of these documents have been updated since 1997 and/or are being updated. The City of Goleta incorporated in 2002 and the City's General Plan/Coastal Land Use Plan was adopted in 2006. In 2015, the City of Goleta is drafting a Local Coastal Program for submittal to the California Coastal Commission with certification anticipated in 2016. The LCP will include a sea level rise vulnerability assessment and related climate adaptation policies/regulations. The City of Santa Barbara and County of Santa Barbara are also updating their LCPs, including incorporating preliminary sea level rise and climate change information.

The original 1997 policies and policy documents discussed above serve as the foundation of the revised goals, policies and actions included in this section. Relevant policies from local jurisdictions' policy documents have been updated and are listed in Appendix C, Policies from Relevant Jurisdictions.

Based on these 1997 policy documents and the goals of the Committee, the four primary goals identified in the 1997 GSEMP were:

1997 GSEMP Goals

ADMINISTRATIVE FRAMEWORK - Provide an administrative framework for the adoption of GSEMP, through cooperative interaction between landowners, public interest groups, responsible agencies & jurisdictions. Compatibility with surrounding land uses must also be considered in the review of plans & projects.

PROTECTION AND MAINTENANCE OF EXISTING RESOURCES, FUNCTIONS AND VALUES – Protect and maintain the natural diversity of species, habitat types & Ecosystem functions through protection of physical processes that naturally maintain these resources.

EDUCATION, RESEARCH AND PUBLIC ACCESS – Promote the Ecosystem's research and public educational and recreational opportunities consistent with protection of the Slough's functions and values and Airport safety, operations and facilities requirements.

RESTORATION AND ENHANCEMENT OF HISTORIC RESOURCES, FUNCTIONS AND VALUES – To the maximum extent, enhance and restore the Slough's natural diversity of resources, habitats, physical processes and functions that have been lost or degraded, through enhancement and restoration of natural self-sustaining processes.

4.2 Status of 1997 Goals, Policies and Actions

Many of the goals, policies and actions in the 1997 GSEMP have been implemented or are ongoing. The status of the original 1997 policies and actions as of 2014 is provided in Table 2-1, Status of GSEMP Policies and Actions, 1997 v. 2014.

**Table 4-1
Status of GSEMP Policies and Actions
1997 v. 2014**

Policy/ Action #	Summary of Policy or Action	Status – Change from 1997 to 2014
ADMINISTRATIVE FRAMEWORK		
Goal - Provide an administrative framework for the adoption of GSEMP, through cooperative interaction between landowners, public interest groups, responsible agencies & jurisdictions. Compatibility with surrounding land uses must also be considered in the review of plans & projects.		
Policy A-1	Implementation and updating of the GSEMP should be coordinated with GSMC. This should be accomplished through cooperation and collaboration...consistent with the Committee's advisory role.	
Action A-1.1	Pursue formalization of GSMC to secure grants, mitigation funds & other monies to implement restoration & enhancement projects.	Ongoing - GSMC not formalized but have secured grants for restoration projects.
Action A-1.2	Pursue funding for the Committee to ensure that it can continue to meet ...as needed to advise on proposed projects, plans, funding of improvements and mitigation measures & other related tasks that may affect the Ecosystem.	Ongoing - Since 1991, SB Airport has funded staff support for GSMC. Additional funding has been provided for the staff to manage the update of the GSEMP.
Action A-1.3	Pursue funding for a manager to oversee the implementation of the Plan & coordination with agencies, property owners & interested parties in the implementation of the Plan.	
Action A-1.4	In cooperation with public agencies & property owners, where feasible, pursue funding to map ESHA, including wetlands & other sensitive habitat within the Ecosystem.	Ongoing - This has been done by City of SB, City of Goleta, SB Co. & UCSB.
Action A-1.5	Update this Plan at five-year intervals or as needed.	Complete – Plan is being updated in 2014-15.
Policy A-2	To the maximum extent feasible & where necessary to accomplish the goals of the Plan, the plans & policies of other jurisdictions should support this Plan.	
Action A-2.1	Work with responsible agencies to amend their existing plans & policies where necessary to enhance conformity with this Plan.	Ongoing – GSMC comments on plans & policies to ensure they are consistent with GSEMP policies.
Action A-	Provide commentary on projects & their consistency with the	Ongoing – GSMC comments on projects relative to

2.2	goals of this Plan.	consistency with GSEMP.
Policy A-3	Coordinate with jurisdictions & agencies on plans, policies, & mitigation measures, including those already adopted & proposed, that could potentially affect the Ecosystem.	
Action A-3.1	Work with the Airport to resolve conflicts between policies & actions included in this Plan, particularly those relating to flooding & wildlife hazards, & the Airport’s safety, operations & facilities requirements.	Complete/Ongoing – Tidal Circulation Study has allowed for increased tidal action; Airport Master Plan is expected to be completed in 2015.
Action A-3.2	Coordinate with agencies & other groups in the gathering & dissemination of technical data relating to the Slough ecosystem.	Ongoing – GSMC is involved in sharing technical data with others.
Action A-3.3	Work with agencies in reviewing, adopting or amending their plans that directly or indirectly affect the Slough to ensure they are compatible with this Plan. Encourage agencies to provide incentives for preservation of ESH resources...	Ongoing. GSMC comments on plans that may affect the Ecosystem. ESH resources are highly protected in all jurisdictions’ plans that include the Goleta Slough area.
Action A-3.4	Coordinate with the Goleta Valley Vector Control District in the management of mosquitos & other species under their jurisdiction that occur in the Slough. Pursue alternatives to District vehicle access in the Slough to minimize disruption of wetland habitats. Work with the District to identify changes in their workload due to physical changes in the Slough as well as the potential need for additional funding in order for the District to carry out its mandate.	The Mosquito and Vector Management District of Santa Barbara County continues to work in the Slough to eradicate pests (need to confirm).
Action A-3.5	Work with Goleta West & Goleta Sanitary Districts, So Cal Gas & other utilities to pursue grants other funding to relocate sanitary sewer trunk, gas & other lines out of the Slough & other sensitive habitats.	Ongoing – GSMC supported GSD’s & GWSD’s projects to move pipelines out of sensitive habitats.
Action A-3.6	Work with County, Caltrans & other agencies to ensure that, to maximum extent feasible, roadway maintenance, widening or new construction is designed to accommodate restoration & preservation of Ecosystem.	Ongoing – GSMC reviews road widening plans including El Colegio and Mesa Road.
Action A-3.7	Work with County, RWQCB & other entities to minimize non-point sources of pollution in the Ecosystem watershed.	New stormwater standards have been added to Table 2-1 and are considered in reviewing plans and projects.
PROTECTION AND MAINTENANCE OF EXISTING RESOURCES, FUNCTIONS AND VALUES.		
Goal – Protect and maintain the natural diversity of species, habitat types & Ecosystem functions through protection of physical processes that naturally maintain these resources.		
Policy P-1	Wherever possible, projects should avoid wetland resources.	

Action P-1.1	Work with the County and other agencies in the review of projects to avoid direct or indirect impacts on wetland resources. Provide appropriate buffers along riparian corridors, adjacent to wetlands and other sensitive habitats	Ongoing during project review; GSMC comments on many projects.
Policy P-2	The opening and closure of the mouth of the Slough at Goleta Beach should be managed to maintain optimal tidal circulation.	
Action P-2.1	Following confirmation that closure of the mouth of the Slough has occurred, actions to open the mouth should be taken as soon as possible. The Committee should work with Flood Control, County Parks and the Coastal Commission to implement this policy.	Ongoing/complete – In late 2014, the issue of managing the mouth of the Slough is being studied as it relates to effects on Tidewater gobies and Steelhead trout and remains unresolved.
Policy P-3	Protect & maintain wetland & other habitat types & populations of sensitive species that are part of or contribute to the Ecosystem.	
Action P-3.1	To the maximum extent feasible, protect areas of riparian and oak woodland, including along Atascadero Creek and the north bluff of UCSB.	Ongoing – GSMC strives to protect these areas during project review.
Action P-3.2	Maintain areas of fresh and brackish marsh associated with the transition from estuarine to palustrine wetlands within the Ecosystem.	Ongoing - CDFG basin on east and west side near Los Carneros have maintained fresh & brackish marsh. Also Area K maintained as brackish. Need to determine if other areas also have this type of wetland.
Action P-3.3	To the maximum extent feasible, eradicate existing noxious, non-native weeds recognized by the CNPS, California Exotic Plant Pest Council & other organizations.	Ongoing - GSMC has supported several eradication projects throughout the Ecosystem.
Action P-3.4	Work with the County and other jurisdictions to ensure that noxious, non-native weeds recognized by CNPS, etc., are not included in landscaping plans within the Ecosystem. To the max extent feasible, landscape with native plants and avoid planting & maintaining exotic plant species.	Ongoing/complete - GSMC reviews projects; jurisdictions have approved plant lists with natives
Action P-3.5	Work with agencies to ensure that the planting or replanting of Eucalyptus trees is discouraged.	
Action P-3.6	Work with UCSB, the Airport, Goleta Beach Co. Park and other landowners where appropriate to lessen the impact on the Ecosystem's bird populations by non-native carnivores, including feral and domestic cats, domestic dogs & red fox.	Ongoing. Need to update what agencies' actions are in this regard.
Action P-	Identify and encourage protection of existing wildlife	There has been a local effort to coordinate on wildlife

3.7	corridors and habitat linkages.	corridors. Need to update.
Policy P-4	Sedimentation from the watershed into tidal marshlands & flats of the Slough should be controlled to the max extent feasible. Sediment control measures should strive to reduce erosion & be compatible with flood protection for the Airport & other potentially affected landowners.	
Action P-4.1	Reduce & manage sedimentation in the Slough through the construction & maintenance, in an environmentally acceptable manner, of sediment basins, berms along creek channels, dredging of creek channels & other measures.	Ongoing – This updated management plan is taking a new look at the use and value of sediment vis a vis sea level rise and other factors. See updated policies and actions .
Action P-4.2	Work with the County, US Forest Service & NRCS to prepare the necessary studies in order to adopt policies & other measures to reduce erosion upstream & resulting sedimentation downstream.	No progress - No studies have been done to date; after the Gap Fire aerial mulching occurred along the Goleta Valley foothills to reduce erosion. Need to update info.
Action P-4.3	Provide input to the County's review of projects & long range planning efforts as they relate to the larger watershed of the Slough.	Ongoing – GSMC reviews County areawide plans, e.g., <i>Draft Eastern Goleta Valley Community Plan</i> which is still under review in 2015.
Action P-4.4	Work with the County to ensure that agriculture and recreational uses are protected along Atascadero & Maria Ygnacio Creeks to serve as a buffer between creeks & adjacent commercial, industrial & residential areas.	Ongoing/complete - The <i>Draft Eastern Goleta Valley Community Plan</i> provides for protection of ag & recreational uses along Atascadero & Maria Ygnacio Creeks
Action P-4.5	Work with watershed landowners & users to reduce direct and indirect impacts on the Slough due to sedimentation, use of chemicals, etc.	No progress – RWQCB has an ag waiver program. Need to update info.
Policy P-5	Flood-deposited sediment that has accumulated in the former tidal wetlands should be periodically removed as a part of a long-term program.	
Action P-5.1	Promote the periodic removal of sediment in the Slough, feeder creeks & other sensitive habitat areas, particularly after major storm events.	Ongoing – While no significant progress has been, Tecolotito and Carneros Creeks have sediment basins that are dredged as needed, particularly after major storm events. Restoration projects have removed sediment as well.
Action P-5.2	Work with Flood Control & other agencies to ensure that the sediment basins that benefit the Slough are maintained.	Ongoing – Flood Control has sediment basins that are regularly dredged.
Policy P-6	To the maximum extent feasible, place dredge materials suitable for beach nourishment in the littoral system.	
Action P-6.1	Work with Flood Control, Coastal Commission & other agencies to place dredge material suitable for beach nourishment in the local beach littoral system.	Ongoing – Flood Control has sediment basins that are regularly dredged and much of that material is deposited on Goleta Beach to make its way into the littoral current.
Policy P-7	Support continued monitoring of water quality in the Slough & take corrective actions when necessary to	

	maintain and, if possible, improve water quality in the Ecosystem.	
Action P-7.1	Work with Co. Environmental Health, RWQCB & other agencies to identify, minimize non-point sources of pollution.	Need to update info.
Action P-7-2	Review & comment on the results of water quality monitoring programs conducted by Flood Control, the Airport, Goleta Sanitary District & other agencies.	Ongoing; GSMC reviews the Airport's SWPPP, NPDES, etc.
RESTORATION AND ENHANCEMENT OF HISTORIC RESOURCES, FUNCTIONS AND VALUES		
Goal – To the maximum extent, enhance and restore the Slough's natural diversity of resources, habitats, physical processes and functions that have been lost or degraded, through enhancement and restoration of natural self-sustaining processes.		
Policy R-1	Priorities for restoration and enhancement should be based on restoring historic functions and providing the greatest benefit to the Ecosystem.	
Action R-1.1	To the max extent feasible, priorities for restoration and enhancement should be (not in priority order) as follows and as illustrated in Figures 26A and B: a. Restoring tidal circulation to historic tidal wetlands; b. Increasing habitat diversity by restoring and enhancing tidal mud flats and high marsh habitats; c. Protecting historic uplands where appropriate to maintain natural and cultural heritage values; d. Providing for fish and wildlife habitat along riparian corridors; and e. Protecting and restoring water quality consistent with beneficial uses identified in the RWQCB's "Basin Plan."	Ongoing/complete – a. Tidal circulation experiment conducted by Airport is complete and consequently tidal circulation is slowly being returned to basins in the Slough. b. Tidal mud flats & high marsh habitats have been restored, e.g., in CDFG wetlands. c. Area I was restored to meet this action. d. Fish passage projects?? Also, Tecolotito realignment provided habitat?? e. Need to update info.
Action R-1.2	[Estuarine and palustrine] habitats that were historically prevalent in the Ecosystem and are desirable for restoration and enhancement are (as shown on the Future Conditions maps, Figures 26A & B [see action for specific habitats])	Ongoing/complete – Restoration to date has included Coastal Sage Scrub, high marsh, etc., as shown in Figures 26A & B.
Action R-1.3	Support the acquisition of easements, land in fee or other measures to facilitate enhancement and restoration projects including, but not limited to, the parcels shown in Table 7 ("Priority Properties for Acquisition for Restoration and Enhancement").	Ongoing – GSMC has tried to acquire land for restoration but has not been successful. However, a considerable number of restoration projects have occurred that GSMC supported.
Policy R-2	Where compatible with existing land uses, restore historic estuarine habitats, functions and conditions. Where existing sensitive resources may be adversely affected by tidal restoration, action should not be taken unless adequate provision for these resources already exists or is made elsewhere in the Ecosystem.	
Action R-	Return Subarea K, located near the GWSD office and UCSB	No progress - Subarea K has not been modified.

2.1	(See Figure 19) to estuary, providing that comparable existing functions and values can be established or are adequately provided elsewhere.	
Action R-2.2	Consider temporary measures, e.g., opening tide gates or breaching berms to inundate new areas, and monitor the effects in order to determine the best actions to benefit the Slough as a whole.	Ongoing – The tide gates have not been opened but restoration work to the west of the gates has been planned to accommodate the possibility that the gates will be removed or relocated to the west in the future. Tide circulation experiment may result in more berms being breached to restore tidal flow.
Action R-2.3	Work with Flood Control, UCSB, SB Airport, Coastal Commission and other agencies and landowners to restore tidal circulation to its historic extent, particularly in the southwest part of the Slough.	Ongoing/complete - The tidal circulation study has resulted in some areas of the Slough reverting to tidal; more areas could be converted.
Policy R-3	Expand and/or restore habitats and sensitive species that have declined within the Ecosystem and/or region. Restoration of habitat or reintroduction of species should be considered in the context of this Plan and other region-wide, state and federal plans.	
Action R-3.1	Restore tidal circulation to diked or otherwise isolated areas of former tidal marsh as shown in Figures 26A & B to benefit Belding’s Savannah Sparrow and other estuarine species.	Ongoing/complete – With the success of the tidal circulation study, some basins have been restored to tidal but more basins could be restored to tidal. Change in mouth management may threaten past restoration efforts.
Action R-3.2	Increase the acreage of upper marsh habitats existing near the upper limit of tidal action ... through such measures as: a. The restoration of tidal circulation to areas previously isolated by berms, dikes or other barriers; and b. The recreation of historic upper marsh habitats along a gradual transition from wetland to upland through the removal of old berms and dikes that were placed at the margins of the estuary.	Ongoing/complete – a. Some basins have had tidal circulation restored and more basins could be converted in the future. b. Seven acres of upper marsh/pickleweed habitat has been provided in the East CDFG basin. c. Change in mouth management may threaten past restoration efforts.
Action R-3.3	Where feasible, reintroduce species that have become extirpated in the Slough into appropriate habitats using source material from the closest geographical location. Locally and regionally rare estuarine plant species should be propagated from seed or cuttings obtained from existing Goleta Slough populations & new populations should be established in appropriate habitats within the Slough.	Ongoing/complete – Several extirpated species have been reintroduced including <i>Lasthenia glabrata coulteri</i> (Gold Fields) and <i>Centromadia parryi australis</i> (Tar Plant).
Action R-	Support the restoration of properties that are contiguous to	Ongoing – The Modoc Open Space has had a

3.4	the GSEMP area or could potentially provide important habitat within the watershed. Identify appropriate sites for restoration outside the GSEMP area including, but not limited to, the Modoc Open Space, lake Los Carneros County Park and riparian sites along creeks in the watershed.	conservation easement protecting it since 1999 though no restoration has occurred; Lake Los Carneros has had some restoration work. Need to update info.
Policy R-4	Improve ecological linkages and avoid habitat fragmentation both within the Ecosystem and between the Slough and adjacent ecosystems.	
Action R-4.1	Identify where habitats are fragmented and potential linkages to reduce fragmentation within the Ecosystem.	There has been a local effort to coordinate on wildlife corridors, including providing for fish passage upstream. <i>Need to update.</i>
Action R-4.2	Promote creek restoration projects, especially those that provide wildlife corridors and habitat linkages.	Ongoing – GSMC has supported numerous creek restoration projects as outlined in Appendix B.
Action R-4.3	Remove berms that separate or isolate habitats in the Slough as shown in Figures 26A and B.	Ongoing/complete – Some berms have been removed but more remain that isolate habitats.
Action R-4.4	Encourage the removal and/or retrofitting of existing culverts or other structures that may impede fish migration or movement.	Ongoing – GSMC has supported fish passage projects in area creeks. Need to update info re culverts.
Policy R-5	The preferred mitigation for permitted habitat disturbances is that which is the most ecologically beneficial and cost effective for the Ecosystem as a whole. Compensation or mitigation should be implemented within the Ecosystem and should result in no net loss or, if possible, a net gain in habitat area and ecosystem functions.	
Action R-5.1	For permitted disturbance of privately owned wetlands or other habitats, the priority for mitigation is as follows: a. On the project site; b. Off site on privately owned land; or c. Off site on publicly owned land. [See action for more re mitigation priorities and guidance]	Ongoing – All required mitigation (public or private projects) has occurred within the GSEMP area.
Action R-5.2	For permitted disturbance of publicly owned wetlands or other habitats, the priority for mitigation is as follows (all within GSEMP area): wetlands or other habitats, the priority for mitigation is as follows: a. On the project site; b. Acquisition of private land for restoration; or c. Other public land for restoration.	
Action R-	Develop mechanisms whereby mitigation can occur on	Need to update info.

5.3	property not owned or controlled by the project proponent if it results in a greater benefit to the Ecosystem. These mechanisms can include focusing on lower priorities in Actions R-5.1 and R-5.2, mitigation banking, in lieu fees, etc.	
Policy R-6	If the potential exists to acquire property for wetlands restoration and/or mitigation purposes, criteria for selection should include the following (not in priority order): [See policy for criteria for selection]	
Action R-6.1	Pursue funding for restoration and/or mitigation by purchasing land in fee, acquiring conservation or other easements, dedication of development rights or other legal means as shown in Figures 26A and 26B.	Ongoing – GSMC has a long record of supporting restoration projects, conservation easements or other means to restore property in perpetuity.
EDUCATION, RESEARCH AND PUBLIC ACCESS		
Goal – Promote the Ecosystem’s research and public educational and recreational opportunities consistent with protection of the Slough’s functions and values and Airport safety, operations and facilities requirements.		
Policy E-1	Provide for the enjoyment and education of the public about the Slough Ecosystem.	
Action E-1.1	Provide public access to the Slough including interpretive access and public turnouts with parking, if possible, in locations that offer views of the Slough (e.g., North Bluff area at UCSB) as shown in Figure 26A.	Ongoing – Several overlooks have been built & tours occur occasionally.
Action E-1.2	Provide Ecosystem interpretive center(s), representing appropriate agencies and interest groups, to educate the public. Interpretative signs should be provided on the periphery of the Slough and wherever else is appropriate.	Ongoing – Signs have been added at two overlooks. Need to update info re newer interpretive signs.
Action E-1.3	Where necessary to protect sensitive resources, limit access into the Slough to those persons and organizations conducting compatible research, educational projects and other appropriate activities.	Ongoing – Because of the Airport, access is somewhat limited though still occurs for research and education. CDFG has said that access to the Ecological Reserve should be restricted.
Action E-1.4	Develop a web page on the World Wide Web.	Ongoing – The website is being updated in 2015.
Policy E-2	Promote field research in the Ecosystem with an emphasis on estuarine functions and related watershed and coastal processes.	
Action E-2.2	Sponsor applications for grants and other monies sought by independent researchers, including UCSB undergraduate and graduate students.	Ongoing – GSMC has supported several grant requests in the past.
Action E-2.3	Monitor the effects of the Plan on the overall health of the ecosystem including hydrology, sensitive species, habitats and biodiversity.	Ongoing – The GSEMP is being updated at this time.

4.3 Development of the Updated Goals, Policies and Actions

An important aspect of updating the 1997 GSEMP and 2012 *Existing Conditions and Monitoring Report* is to update the goals, policies and actions to reflect the current understanding of the relevant information and issues affecting the Ecosystem. The 2015 goals, policies and actions are derived from several sources:

- **1997 GSEMP** - Table 4-1 lists the 1997 policies and actions and their status as of 2014. Many actions were one-time actions that have been implemented, therefore they have been deleted. Where a policy or action is ongoing, it has been updated and retained.
- **Sea Level Rise Vulnerability Assessment** – GSMC decided that incorporating SLR considerations into the policies and actions, instead of creating a new stand alone set of SLR policies, allows for a more comprehensive approach to the issues relating to the SLR and the Goleta Slough Ecosystem and its management. The results of this important study resulted in many revisions to policies and actions as local impacts of climate change were not issues discussed by GSMC in the mid-1990s. Section 3 (Looking Ahead) summarizes the findings of this study, and more complete information is provided in Appendices D and F.
- **Inlet modeling** – Appendix G includes the Goleta Slough Inlet Modeling Study that was completed in early 2015 and incorporated into this Plan. The key findings from this study were integrated throughout the goals, policies and actions.
- **Goleta Slough Mouth Management Study** – This study is being prepared by the Airport and will be released in fall 2015. Preliminary information from the study has been considered in the review and updating of policies and actions.
- **GSMC discussion** – GSMC held monthly meetings between March and August 2015 during which there were animated discussions of the origin, intent and purpose of the goals, policies and actions. Many edits were made at the meetings, resulting in clearer, broader and more comprehensive goals, policies and actions contained in this Plan.

Consequently, while the 1997 Plan included policies derived from those of local jurisdictions, the updated goals, policies and actions go farther than those in that plan, particularly relating to climate change, sea level rise, and Slough and mouth management issues. Moreover, as local agencies begin conducting SLR studies and LCP updates, it is hoped they will find some of the methodologies used in the studies, policies and actions included here useful in their planning.

4.4 Updated Goals, Policies and Actions – 2015

The 2015 updated goals are similar to the 1997 goals (see Section 4.1 above), but have been updated to include new information and the findings of the SLR Vulnerability Assessment summarized in Section 3. Depending on the outcome of the inlet (or mouth) modeling and management option studies that are underway in early 2015, these goals, policies and actions may need to be revisited as they rely heavily on having tidal circulation in the estuary.

ADMINISTRATIVE FRAMEWORK (Goal A) - Provide an administrative framework for the adoption, implementation and periodic updates of the 2015 *Goleta Slough Area Sea Level Rise and Management Plan* through cooperative interaction between landowners, public

interest groups, responsible agencies and jurisdictions. Consider the evolution of habitats, adaptive management and other changes that are likely to occur over time, including those related to climate change. Compatibility with surrounding land uses must also be considered in the review of plans and projects.

PROTECTION AND MAINTENANCE OF EXISTING RESOURCES, FUNCTIONS AND VALUES

(Goal P) – Protect and maintain the natural diversity and resilience of species, habitat types and Ecosystem functions through protection of physical processes that naturally maintain these resources. More deliberate adaptation actions may be necessary as sea level rise accelerates and other climate change impacts become more apparent. These adaptation strategies, when implemented, should to the maximum extent feasible avoid further alteration of habitats or physical processes.

RESTORATION AND ENHANCEMENT OF RESOURCES, FUNCTIONS AND VALUES (Goal R) – To the maximum extent possible, enhance and restore the Slough’s natural diversity of resources, habitats, physical processes and functions that have been lost or degraded and that are needed to maintain the resilience of the Slough in the light of climate change.

EDUCATION AND RESEARCH (Goal E) – Increase the understanding and awareness of the Goleta Slough Ecosystem and its historic and future functions and values, through providing inventories of resources and supporting research and monitoring, to inform decision makers and the public.

A significant change in the policies and actions as a result of the SLR information is that sediment that accretes in the Slough is now seen as a potential tool to combat sea level rise, rather than something that is a detriment to the functioning of the riparian, upland and wetland habitats in the Goleta Slough area.

The Goals, Policies and Actions of the 2015 *Goleta Slough Area Sea Level Rise and Management Plan* are:

ADMINISTRATIVE FRAMEWORK

Goal A - Provide an administrative framework for the adoption, implementation and periodic updates of the GSEMP through cooperative interaction between landowners, public interest groups, non-profits, responsible agencies and jurisdictions. Consider the evolution of habitats, coastal hazards, adaptive management and other changes that are likely to occur over time, including those related to climate change. Compatibility with surrounding land uses must also be considered in the review of plans and projects.

Policy A-1 - Implementation and updating of the *Goleta Slough Area SLR and Management Plan* should be coordinated with GSMC. This should be accomplished through cooperation and collaboration consistent with the Committee’s advisory role.

Action A-1.1 - Pursue formalization of GSMC (e.g., acquire non-profit status, form a joint powers agreement with interested groups and agencies, etc.) to secure grants, mitigation funds and other monies to implement restoration and enhancement projects.

Action A-1.2 - Pursue funding for the Committee to ensure that it can continue to meet as needed to advise on proposed projects, plans, funding of improvements and mitigation measures and other related tasks that may affect the Ecosystem.

Action A-1.3 - Pursue permanent funding for a manager to coordinate with agencies, property owners and interested parties in the implementation of the Plan.

Action A-1.4 - In cooperation with public agencies and property owners, where feasible, pursue funding to map ESHA, including wetlands and other sensitive habitats within the Ecosystem.

Action A-1.5 - Update this Plan at five-year intervals or as needed, including natural resources and other technical information that have not been updated since 1997.

Policy A-2 - Coordinate with jurisdictions and agencies on plans, policies, and mitigation measures, including those already proposed and adopted, to ensure that they benefit the resources of the Goleta Slough Ecosystem to the extent feasible.

Action A-2.1 - Work with responsible agencies to amend their existing plans and policies where necessary to encourage conformity with this Plan.

Action A-2.2 - Provide commentary on projects and their consistency with the goals of this Plan.

Action A-2.3 - Work with the Airport to resolve conflicts between policies and actions included in this Plan, particularly those relating to flooding and wildlife hazards, and the Airport's safety, operations and facilities requirements.

Action A-2.4 - Coordinate with agencies and other groups in the gathering and dissemination of technical data relating to the Slough Ecosystem.

Action A-2.5 - Work with agencies in reviewing, adopting and amending their plans that directly or indirectly affect the Slough to ensure they are compatible with the goals of this Plan. Encourage agencies to provide incentives for preservation of ESHA resources.

Action A-2.6 - Coordinate with the Goleta Valley Vector Control District in the management of mosquitos and other species under their jurisdiction that occur in the Slough area. Pursue alternatives to District vehicle access in the Slough to minimize disruption of wetland habitats.

Action A-2.7 - Coordinate with Goleta West and Goleta Sanitary Districts, Goleta Water District, So. Cal Gas and other utilities to pursue grants or other funding to relocate sanitary sewer trunk, gas and other lines out of the Slough and other sensitive habitats.

Action A-2.8 - Coordinate with County, Caltrans and other agencies to ensure that, to maximum extent feasible, roadway maintenance, widening or new construction is designed to accommodate restoration and preservation of the Ecosystem.

Action A-2.9 - Coordinate with the U.S. Forest Service, County, RWQCB and other public and private entities to minimize non-point sources of pollution, flooding and erosion in the Ecosystem watershed.

Action A-2.10 – Work with local agencies, utilities, special interest groups and property owners to minimize impacts associated with management of the Goleta Slough mouth, enhance habitat for endangered and other sensitive species, improve water quality, etc. Coordinate with local agencies and others on mitigation and restoration projects that cross jurisdictional lines.

PROTECTION AND MAINTENANCE OF EXISTING RESOURCES, FUNCTIONS AND VALUES

Goal P – Protect and maintain the natural diversity and resilience of species, habitat types and Ecosystem functions through protection of physical processes that naturally maintain these resources. More deliberate adaptation actions will be necessary as sea level rise accelerates and other climate change impacts become more apparent. These adaptation strategies, when implemented, should to the maximum extent feasible avoid further alteration of habitats or physical processes.

Policy P-1 - Wherever possible, projects should avoid wetland and upland resources.

Action P-1.1 - Coordinate with the Cities of Goleta and Santa Barbara, UCSB and the County in the review of projects to avoid direct or indirect impacts on wetland resources. Provide appropriate buffers along riparian corridors, adjacent to wetlands and other sensitive habitats.

Policy P-2 - The Goleta Slough inlet should be managed to maximize tidal circulation, water quality, and diversity and resilience of species and habitats.

Action P-2.1 – When the Goleta Slough inlet has closed and to-be-defined thresholds have been exceeded, the Slough inlet should be opened to maintain tidal circulation, water quality, and diversity and resilience of species and habitats in the Ecosystem.

Action P-2.2 - The QCM results suggest that flood protection can be achieved under a range of managed breach thresholds (e.g., 6.5' and 7.5' NAVD). We recommend further refinement of the proposed mechanical breach thresholds to achieve optimum benefits for the local ecology, infrastructure protection, and aviation safety.

Policy P-3 - Protect and maintain the diversity and functions of wetland and other habitat types and populations of sensitive species that are part of or contribute to the Ecosystem.

Action P-3.1 - To the maximum extent feasible, protect areas of riparian and oak woodland, including along Atascadero Creek and the north bluff of UCSB.

Action P-3.2 - Maintain the functions and connectivity of fresh and brackish marsh associated with the transition from estuarine to palustrine wetlands within the Ecosystem and consider changing environmental conditions such as sea level rise.

Action P-3.3 - To the maximum extent feasible, eradicate existing noxious, non-native weeds recognized by the CNPS, California Exotic Plant Pest Council and other organizations.

Action P-3.4 - Work with the County and other jurisdictions to ensure that noxious, non-native weeds recognized by CNPS, etc., are not included in landscaping plans within the

Ecosystem. To the max extent feasible, landscape with native plants and avoid planting and maintaining exotic plant species. Encourage adoption of weed prevention and equipment cleaning protocols.

Action P-3.5 - The planting or replanting of Eucalyptus trees should be discouraged; substitute with the planting of appropriate native vegetation to support butterflies and other native species.

Action P-3.6 - Work with UCSB, the Airport, City of Goleta, SB County Goleta Beach Park and other landowners where appropriate to lessen the impact on the Ecosystem's bird populations by non-native carnivores, including feral and domestic cats, domestic dogs and red fox.

Action P-3.7 - Identify and encourage protection of existing wildlife corridors and habitat linkages.

Action P-3.8 – Encourage modification to the Slough's perimeter fencing (e.g., on the north side of Tecolotito Creek closer to the airfield), consistent with FAA and other safety standards, to improve movement for coyotes, fox and other mammals within the Ecosystem.

Policy P-4 – Sedimentation from the watershed into tidal marshlands and flats of the Slough should be encouraged to the maximum extent feasible in order to maintain natural Slough functioning and to address anticipated sea level rise. Sediment management measures should strive to reduce erosion, maintain channel conveyance, increase habitat diversity and help address future sea level rise. Sediment management should be compatible with flood protection for the Airport and other potentially affected landowners.

Action P-4.1 – Maintain channel conveyance using a variety of approaches including sediment basins, selective breaching of berms along creek channels, and dredging of existing channels. Give consideration to reusing trapped or dredged sediment beneficially in the Slough and on the beach to enhance existing habitats and increase resilience to sea levels rising by allowing, or emulating, accretion and natural sediment transport processes.

Action P-4.2 – Manage topographic diversity and address sea level rise by opportunistic reuse of sediment.

Action P-4.3 - Coordinate with the City of Goleta, County, US Forest Service, RWQCB and NRCS to prepare the necessary studies in order to adopt policies and other measures to reduce erosion upstream.

Action P-4.4 - Provide input to the County's and Cities of Santa Barbara and Goleta's review of projects and long range planning efforts as they relate to the larger watershed of the Slough.

Action P-4.5 - Work with the County to ensure that agriculture, recreational uses and sensitive habitats are protected along Atascadero and Maria Ygnacio Creeks to serve as a buffer between creeks and adjacent commercial, industrial and residential areas.

Action P-4.6 - Work with watershed landowners and users to reduce direct and indirect impacts on the Slough due to sedimentation, use of chemicals, etc.

Policy P-5 – Allow accretion to occur within wetlands, as appropriate, to counteract sea level rise.

Action P-5.1 - Promote natural sedimentation processes of fine sediment in the Slough, feeder creeks and other sensitive habitat areas, where appropriate.

Action P-5.2 - Work with Flood Control and other agencies to maintain sediment basins in a manner that benefits the Slough, including limiting impacts to special-status species such as Tidewater gobies.

Action P-5.3 - Investigate other local sources of suitable material that may be available outside the Slough, e.g., the use of material from the Devereux Slough system, to counteract the effects of SLR.

Policy P-6 - Beyond that required for natural Slough functioning, place appropriate amounts of sand and cobbles that are suitable for beach nourishment in the littoral system near Goleta Slough.

Action P-6.1 - Coordinate with Flood Control, BEACON, Coastal Commission and other agencies to place coarse material suitable for beach nourishment in the local beach littoral system.

Policy P-7 - Support continued monitoring of water quality in the Slough and take appropriate actions in line with Goal P when necessary to maintain and, if possible, improve water quality in the Ecosystem.

Action P-7.1 - Work with Co. Environmental Health Services, RWQCB and other agencies to identify and minimize point and non-point sources of pollution.

Action P-7.2 - Review and comment on the results of water quality monitoring programs conducted by Santa Barbara Channelkeeper, Flood Control, the Airport, Goleta Sanitary District and other agencies to ensure that water quality continues to improve throughout the Ecosystem.

RESTORATION AND ENHANCEMENT OF RESOURCES, FUNCTIONS AND VALUES

Goal R – To the maximum extent possible, enhance and restore the Slough’s natural diversity of resources, habitats, physical processes and functions that have been lost or degraded and that are needed to maintain the resilience of the Slough in the light of climate change.

Policy R-1 - Priorities for restoration and enhancement should consider functions and diversity in order to provide the greatest benefit to the Ecosystem for future conditions including climate change. However, long-term plans for the Goleta Slough region should anticipate the decreasing effectiveness of inlet management as a management tool for achieving flood protection and habitat goals as sea levels rise. Long-term plans for the Goleta Slough Ecosystem should also incorporate adaptation strategies that anticipate significant increases in lagoon water levels and near-continuous open-lagoon conditions by the end of the century (Inlet Study).

Action R-1.1 - To the maximum extent feasible, priorities for restoration and enhancement should consider historic conditions and future sea level rise and focus on the following:

- a. Restoring tidal circulation to basins that were previously tidal and established tidal wetlands;
- b. Accommodating future habitat diversity by restoring and enhancing vegetated wetlands and transitional upland habitats;
- c. Enhancing connectivity of existing and new uplands to the wetlands to maintain natural wetland functions and cultural heritage values;
- d. Enhancing existing and providing new fish and wildlife habitat corridors; and
- e. Protecting and restoring water quality consistent with beneficial uses identified in the RWQCB's "Basin Plan."

Action R-1.2 – Identify restoration opportunities to create rare habitat types and those that support endangered species that have been lost from the system (e.g., upper marsh transitional habitats) and are compatible with changing climate conditions. (See the 1997 GSEMP for a full list of habitats).

Action R-1.3 - Support the acquisition of easements, land in fee or other measures within the Slough and its watershed to facilitate climate adaptation, enhancement and restoration projects.

Policy R-2 - Where compatible with existing land uses and future conditions, restore estuarine habitats, functions and conditions. Where existing sensitive resources may be adversely affected by tidal restoration, action should not be taken unless appropriate provision for these resources already exists or is made elsewhere in the Ecosystem.

Action R-2.1 - Return Subarea K, located near the GWSD office and UCSB (See Figure 2-2W) to estuary, providing that comparable existing functions and values can be established or are adequately provided elsewhere.

Action R-2.2 – Evaluate optimal tidal circulation and consider pilot projects, e.g., Basins G and L/M, to inundate new areas and monitor the effects in order to determine the best actions to benefit the Slough as a whole. Evaluate the feasibility of large-scale landscape shaping.

Action R-2.3 - Evaluate specific opportunities for multi-benefit projects for habitat enhancement, restoration and lagoon management. Evaluate potential project alternatives to include a refined analysis of impacts on local channel hydraulics and lagoon inlet dynamics.

Policy R-3 - Expand and/or restore important habitats and species that have declined or have been extirpated within the Ecosystem and/or region as appropriate. Restoration of habitat, assisted migration and reintroduction of species should be considered in the context of this Plan and other region-wide, state and federal plans as well as future conditions such as sea level rise.

Action R-3.1 - Restore tidal circulation to diked or otherwise isolated areas of former tidal marsh to benefit estuarine species including Belding's Savannah Sparrow.

Action R-3.2 - Increase the acreage of upper, brackish and freshwater marsh habitats existing near the upper limit of tidal action to create a diverse marsh ecotone through such measures as:

- a. The restoration of tidal circulation to areas previously isolated by berms, dikes or other barriers;
- b. The recreation of previous upper marsh habitats along a gradual transition from wetland to upland through the removal of old berms and dikes that were placed at the margins of the estuary; and
- c. The acquisition of, or easements for, upland areas adjacent to wetlands in anticipation of upslope habitat advancement/transgressions due to future sea level rise.

Action R-3.3 - Where feasible and appropriate in the long term, reintroduce species that have become extirpated in the Slough into appropriate habitats using source material from the closest geographical location. Locally and regionally rare estuarine plant species should be propagated from seed or cuttings obtained from existing Goleta Slough populations and new populations should be established in appropriate habitats within the Slough.

Action R-3.4 - Support the restoration of properties that are contiguous to the GSEMP area or could potentially provide important habitat within the watershed. Identify appropriate sites for restoration outside the GSEMP area.

Action R-3.5 – Encourage the use of Goleta Slough area genotypes in restoration, enhancement and mitigation projects in the Ecosystem.

Policy R-4 - Improve ecological linkages and avoid habitat fragmentation both within the Ecosystem and between the Slough and adjacent ecosystems.

Action R-4.1 - Identify where habitats are fragmented and potential linkages to reduce fragmentation within the Ecosystem. Develop a plan for improving habitat connectivity within the watershed and within the Ecosystem.

Action R-4.2 - Promote creek restoration projects and upland acquisition within the watershed of slough system, especially those that provide fish and wildlife corridors and habitat linkages.

Action R-4.3 - Remove berms and lower culverts (e.g., under Hollister Avenue, Los Carneros Road and along Atascadero Creek that reduce hydraulic connectivity and separate or isolate habitats in the Slough.

Action R-4.4 - Encourage the removal and/or retrofitting of existing culverts or other structures that may impede fish and wildlife migration or movement.

Policy R-5 - The preferred project mitigation and adaptation for permitted habitat disturbances is that which is the most ecologically beneficial and cost effective for the Ecosystem as a whole. Compensation or mitigation should be implemented within the Ecosystem and should result in no net loss or, if possible, a net gain in habitat area and ecosystem functions.

Action R-5.1 - For permitted disturbance of privately owned wetlands or other habitats, the priority for project mitigation is as follows:

- a. First, on the project site;
- b. Second, off site on privately owned land; or
- c. Third, off site on publicly owned land.

Action R-5.2 - For permitted disturbance of publicly owned wetlands or other habitats, the priority for project mitigation is as follows (all within the Goleta Slough Ecosystem area):

- a. First, on the project site;
- b. Second, acquisition of private land or easements for restoration; or
- c. Third, other public land for restoration.

Action R-5.3 – Encourage the development and adoption of policies and procedures by regulatory agencies whereby project mitigation and adaptation can occur on property not owned or controlled by the project proponent if it results in a greater benefit to the Ecosystem.

Policy R-6 - If the potential exists to acquire property rights for wetland restoration, climate adaptation and/or project mitigation purposes, criteria for selection should include the following (not in priority order):

- a. Potential ecological value of existing or restored habitat in relation to whole ecosystem;
- b. Maximum benefit to Ecosystem considering cost of acquisition and/or restoration;
- c. Proximity to high quality habitat which creates the potential to have larger, more complex functions among the habitats in the area;
- d. Like habitat to that which was lost, consistent with Policies R-1 and R-2;
- e. Degree of degradation, i.e., less degraded land may be preferable;
- f. Risk of development or permanent loss of habitat;
- g. Minimal pre-restoration investment;
- h. Projected life of habitat with climate change and sea level rise;
- i. Other management considerations, e.g., potential for trespassing, ongoing maintenance needs, flood damage potential, etc.; and
- j. The ability to provide room for habitats to transgress upslope.

Action R-6.1 - Support funding for restoration, adaptation and/or project mitigation by purchasing land in fee, acquiring conservation or other easements, dedication of development rights or other legal means.

EDUCATION AND RESEARCH

Goal E – Increase the understanding and awareness of the Goleta Slough Ecosystem to inform decision makers and the public.

Policy E-1 - Monitor Ecosystem functions and values to inform research.

Action E-1.1 - Participate in watershed monitoring programs of sea level rise and Ecosystem change.

Action E-1.2 – Develop comprehensive, well-designed, and rigorous physical, chemical, hydrological and biological monitoring programs to collect information to use to guide restoration, adaptation and management actions. Include procedures to facilitate monitoring in areas with security restrictions such as within the Airport. Specifically monitoring within the Ecosystem to, for example:

- a. Refine understanding of the hydrodynamics and sediment movement in the Slough;
- b. Study how upland habitats and agriculture and open space within the watershed contribute to and affect the functioning of the Slough
- c. Monitor the effectiveness of restoration, adaptation and project mitigation projects; and
- d. Provide inventories of all natural resources in the Ecosystem including terrestrial and aquatic flora and fauna and how they relate to different habitats.

Policy E-2 - Undertake research on the Ecosystem estuarine functions and related watershed and coastal processes to identify the long-term effects of climate change on the Slough. Future studies should include a statistical analysis of coastal and hydrologic processes in order to better characterize the expected frequency occurrence of extreme conditions including prolonged droughts, El Nino and extreme rain/flood events.

Action E-2.1 - Participate in regional (i.e., California coast) assessments of sea level rise vulnerability, risk and adaptive planning efforts to ensure compatible treatment for sea level rise across jurisdictional boundaries.

Action E-2.2 - Incorporate the best available science, consistent with regional (i.e., California coast) policy efforts, as new, peer-reviewed studies on sea level rise become available and as agencies such as the NRC, OPC, State Lands Commission and the Coastal Commission issue updates to their guidance reports.

Action E-2.3 - Advocate for research and monitoring programs to understand the overall health of the Ecosystem including hydrology, sediment, sensitive species, habitats and biodiversity, the long-term evolution of the Ecosystem and identify triggers and thresholds to guide management decisions. Analyze and research specific issues, e.g., how projected changes in water levels and vegetation will affect wildlife communities and migration corridors as well as specific species, e.g., Belding's savannah sparrow, Tidewater Goby and Steelhead Trout.

Action E-2.4 - Sponsor applications for grants and other monies sought by independent researchers, including UCSB undergraduate and graduate students.

Action E-2.5 - Monitor the effects of the Plan on the overall health of the Ecosystem including hydrology, sensitive species, habitats and biodiversity including:

- a. Ongoing comprehensive biological monitoring programs; and
- b. Project-specific analysis and follow-up monitoring.

Policy E-3 - Support public education and recreational opportunities consistent with protection of the Slough's existing and future functions and values, to support the goals of this Plan.

Action E-3.1 - Improve public access to the Slough by providing more interpretive signs and public turnouts with parking in locations that offer views of the Slough, (e.g., North Bluff area at UCSB), etc.

Action E-3.2 - Continue to maintain and update the GSMC web page on the World Wide Web.

4.5 Priorities and Implementation of the *Goleta Slough Area SLR and Management Plan*

Implementation of the *Goleta Slough Area SLR and Management Plan* will require continued collaboration among agencies, public interest groups and property owners that have been involved in the development of the plan. Funding for projects, research and studies will likely come from grants, future development projects that require mitigation and monitoring, implementation of other plans and volunteer efforts.

4.5.1 Summary of all Actions

The goals, policies and actions in this Plan are very comprehensive and address a myriad of issues as detailed in Section 4.4 above. GSMC decided to summarize and group all actions by broad category to facilitate their implementation. The Committee also spent considerable time and effort in establishing priorities for the actions, i.e., which should be done as soon as possible, which can wait and which are ongoing? GSMC also ranked the summarized actions by priority to facilitate the Plan's implementation.

Section 4.5.3 below includes a summary of actions recommended in the Plan by subject area with similar actions grouped together and referenced so that the reader can get an overview as well as read the actions in their entirety.

4.5.2 Priorities of all Actions

The priority of each of the summarized actions is listed below in the left column. In assigning the priorities, GSMC did not consider funding, permits required, or any other practical matters. The A, B, C and D priorities are defined as follows:

- A. **Most important** - These are very important actions that GSMC will be pursuing immediately.
- B. **Important** - These are important actions that can wait a little while to be initiated and implemented.
- C. **Other actions** - These actions need to be done eventually but not immediately.
- D. **Ongoing actions** - These are or should be ongoing actions, including coordinating with local and regional agencies on updates of plans and review of projects, supporting monitoring and research within the Ecosystem, encouraging connectivity between fragmented habitats, etc.

Finally, GSMC found that there were many 'A' and 'B' priorities and deciding which to implement first would be a formidable task. Therefore, GSMC decided that further refinement of the 'A' and 'B' priorities was needed. Within the priorities, there are A1, A2, A3 and A4 "sub-priorities" defined as:

A1 – Administration and Management - Focus on formalizing GSMC, providing a sustainable funding source, etc., so that this Plan can be fully implemented.

A2 – Goleta Slough Inlet Management - Given the results of the *Goleta Slough Mouth Inlet Study* (Appendix G), it appears that, as conditions change and the effects of climate change increase, the inlet (or mouth) will naturally be open more than current conditions reflect. Moreover, as GSMC advocates for the Goleta Slough inlet being managed to be open in the interim (when to-be-defined thresholds are exceeded), the following priorities assume that the inlet is open much of the year.

A3 – Monitoring and Research – In developing this and other plans, it has become evident that there are many opportunities for monitoring and research to inform future plans and studies.

A4 – Protection, enhancement and restoration – These 'A' priorities were ranked fourth as the first three priorities are essential before large-scale, comprehensive protection, enhancement and restoration projects can be planned, funded and implemented.

The 'B' priorities are also ranked B1, B2, B3 and B4 based on the same priorities as listed immediately above, i.e., B1 is Administration and Management, B2 is Goleta Slough Inlet Management, etc.

The 'C' priorities are not ranked further as they are less likely to be implemented in the near term. The 'D' priorities are ongoing and will continue to be implemented on an ongoing basis.

4.5.3 Summary of Actions and Assignment of Priorities

Administration and Management

- A1 Formalize GSMC** - Pursue formalization of GSMC and funding for a manager to continue its efforts (Actions A-1.1 to 1.3). [Note – GSMC agreed that the biggest question is what's the best model for management of the Slough, e.g., paid manager, create or merge with a non-profit, establish a Joint Powers Agreement, etc.]
- D Update Plan** - Update this Plan at five-year intervals or as needed (Action A-1.5).
- D Encourage conformity with Plan** - Coordinate with agencies to amend their plans and policies to encourage conformity with this plan and continue to review projects and plans and comment on their consistency with this plan. Coordinate on data collection, reducing impacts and new mitigation and restoration projects (Actions A-2.1 through 2.10).
- C Improve public access** to the Slough, including interpretive signs, more access and turnouts with parking, in locations that offer views of the Slough (Action E-3.1).
- A1 GSMC webpage** - Develop and maintain a web page for GSMC (Action E-3.2).

Goleta Slough inlet Management and Tidal Circulation

- A2 Slough inlet closure** – When yet to-be-defined thresholds have been exceeded and the Goleta Slough inlet (or mouth) has closed, the Slough inlet should be opened to maintain tidal circulation, water quality, and diversity and resilience of species and habitats (Action P-2.1).
- A2 Breach thresholds** - The QCM results suggest that flood protection can be achieved under a range of managed breach thresholds (e.g., 6.5' and 7.5' NAVD). We recommend further refinement of the proposed mechanical breach thresholds to achieve optimum benefits for the local ecology, infrastructure protection, and aviation safety (Inlet Study; new Action P-2.2).
- B2 Evaluate optimal tidal circulation** - Consider pilot projects (e.g., Basins G and L/M) to inundate new areas and monitor the effects in order to determine the best actions to benefit the Slough as a whole. Evaluate the feasibility of large-scale landscape shaping. (Action R-2.2).
- A2 Evaluate specific opportunities for multi-benefit** habitat enhancement, restoration and lagoon management projects. Evaluate potential project alternatives to include a refined analysis of climate change impacts on local channel hydraulics and lagoon inlet dynamics (Inlet Study; Action R-2.3).

Monitoring and Research

- B3 Inlet management over the long-term** - Long-term plans for the Goleta Slough region should anticipate the decreasing effectiveness of inlet management as a management tool for achieving flood protection and habitat goals as sea level rises reaches three (3) feet (Inlet Study).
- C Adaptation strategies** - Long-term plans for the Goleta Slough region should incorporate adaptation strategies that anticipate significant increases in lagoon water levels and near-continuous open-lagoon conditions by the end of the century (Inlet Study).
- B1 Statistical analysis** - We recommend that future studies include a statistical analysis of coastal and hydrologic processes in order to better characterize the expected frequency occurrence of extreme conditions including prolonged droughts, El Nino and extreme rain/flood events (Inlet Study; added to Policy E-2).
- A3 Watershed monitoring** - Participate in watershed monitoring programs of Ecosystem change (Action E-1.1).
- D Sponsor research** - Support grants and other monies sought by independent researchers (Action E-2.4).
- A Water quality monitoring** - Review and comment on water quality monitoring programs to ensure water quality continues to improve throughout the Ecosystem (Action P-7.2).

- A Specific monitoring** - Undertake specific monitoring within the Ecosystem to refine understanding of the hydrodynamics and sediment movement and to gauge the effectiveness of restoration, adaption and project mitigation (Action E-1.2).
- D Regional assessments** - Participate in regional (i.e., California coast) assessments of SLR vulnerability, risk and adaptive planning efforts to ensure compatibility across jurisdictional lines. Incorporate the best available science as new studies on SLR become available and as agencies issue guidance updates (Actions E-2.1 and E-2.2).
- A3 Overall health of Ecosystem** - Advocate for research and monitoring programs to understand the overall health of the Ecosystem including hydrology, sediment, sensitive species, habitats and biodiversity and identify triggers and thresholds to guide management decisions (Action E-2.3). Need: (1) ongoing, comprehensive biological monitoring program; (2) project-specific analysis and follow-up monitoring (Action E-2.5).

Protection, Enhancement and Restoration of Habitats

- A3 ESHA mapping** - Cooperate with others to fund mapping of Environmentally Sensitive Habitat Areas within the Ecosystem (Action A-1.4).
- D Avoid impacts** - Work with local jurisdictions to protect and avoid direct or indirect impacts on wetlands and other sensitive habitats (Actions P-1.1 and P-3.1).
- D Functions and connectivity of habitats** - Maintain the functions and connectivity of fresh and brackish marsh and consider changing environmental conditions such as SLR (Action P-3.2).
- D Eradicate weeds** - Work with other agencies to eradicate existing noxious, non-native weeds and avoid planting new exotic and invasive species (Actions P-3.3 to 3.5).
- A3/4 Wildlife corridors** - Identify and encourage protection of existing wildlife corridors, including at the Airport where feasible, including removal of obstacles to wildlife migration (Actions P-3.7 and 3.8).
- D Consider historic conditions** - Priorities for restoration and enhancement should recognize historic functions and diversity in order to create a resilient Ecosystem for future conditions including climate change. Encourage the use of Goleta Slough area genotypes in projects (Policy R-1, Actions R-1.1, R-1.2, R-3.4 and R-3.5).
- D Support acquisition to facilitate climate adaptation and restoration** - Support measures to facilitate climate adaptation, enhancement and restoration projects within the Slough Ecosystem and its watershed (Action R-1.3).
- A3/4 Reduce habitat fragmentation** - Identify where habitats are fragmented (including due to berms or culverts) and potential linkages to reduce fragmentation within the Ecosystem. Promote creek restoration projects, especially those that provide fish and wildlife corridors and habitat linkages, as well as upland acquisition (Actions R-4.1 through 4.4).
- A4 Priority for mitigation** - For permitted disturbance of wetlands or other habitats, encourage mitigation first on the project site, then on privately owned land, then offsite,

with the overall goal of providing the greatest benefit to the Ecosystem (Actions R-5.1, 5.2, and 5.3).

- D Land protection** - Support funding for restoration, climate adaptation and/or project mitigation by acquiring land in fee, through easements, etc., using criteria for selection (see criteria in Policy R-6 – Action R-6.1).

Sedimentation and Beach Nourishment

- D Maintain channel conveyance** in the Slough using a variety of approaches that achieve flood control goals, promote natural sedimentation processes of fine sediment and minimize impacts to natural habitats and organisms. Give consideration to reusing trapped or dredged sediment beneficially to enhance existing habitats and promote natural sediment processes to increase resilience to sea levels rising and/or for beach nourishment (Actions P-4.1, 5.1, 5.2 and 6.1).
- D Creek buffers** - Work with local agencies to ensure adequate riparian habitat is available to serve as buffers along Goleta Slough Ecosystem creeks and other sensitive habitats (Action P-4.5).

Support of Specific Species

- D Increase rare habitat types that are or were native to the Ecosystem** - Identify restoration opportunities to create rare habitat types such as upper marsh (transitional) habitats that have been lost from the Ecosystem and are compatible with changing climate conditions. (Action R-1.2 and R-3.1).
- A4 Create habitat types for sensitive species** - Identify restoration opportunities to create habitat that support endangered species that are or were native to Ecosystem and are compatible with changing climate conditions (Action R-3.1) (See 1997 GSEMP for list of habitats - Action R-1.2).
- C Reintroduce extirpated and listed species** - Where feasible and appropriate, reintroduce species that have been extirpated in the Ecosystem using source material from the closest geographical location. Where catastrophes, lack of corridors, or low dispersal rates have led to reduced complexity in the Ecosystem, deliberate reintroduction programs may be appropriate (Action R-3.3).

Watershed/Areawide Issues

- A3 Reduce upstream erosion** - Coordinate with local, state and federal agencies to prepare short, medium and long-term studies and plans to reduce erosion in the watershed and upstream of the Slough (Actions P-4.3 and 4.4).
- A3 Study fluvial–Slough interactions** – Promote studies of the whole watershed to understand the overall health of the Ecosystem including hydrology, sensitive species, habitats and biodiversity (Action E-2.3).
- D Reduce watershed impacts on Slough** - Coordinate with watershed landowners and users to reduce impacts on the Slough due to sedimentation, chemical use, etc. (Action P-4.6).

- D Minimize point and non-point pollution to improve water quality** - Coordinate with local and state agencies to identify and minimize point and non-point sources of pollution (Actions P-7.1 and 7.2).
- D Support restoration of properties contiguous to the Goleta Slough Ecosystem** or where could potentially provide important habitat within the watersheds. Identify appropriate restoration sites outside the Ecosystem (Action R-3.4).

4.6 Monitoring Protocols

This section discusses how we measure the effectiveness of management actions on:

1. Status and trends of the Ecosystem;
2. Special status species and rare habitats;
3. Water quality
4. Human health
5. Ecosystem services, e.g., flood control, water quality, wildlife support, recreation etc.
6. Mitigation, restoration and adaptation as it relates to natural resources and processes

Furthermore, the section offers possible standards for and questions about Ecosystem monitoring of natural changes independent of projects. This is needed to maintain awareness of natural resource events and shifts in community composition, recognizing climate change and sea level rise.

Past monitoring programs have focused on assessing the success of mitigation and restoration efforts, concentrating on selected past examples and performance standards for restoration projects. While these are important, given growing concerns about climate change, the shift in focus of monitoring efforts should be to:

1. Establish current conditions as a baseline (e.g., we need to know the kinds, amounts, and distributions of different natural resources to document change and manage them);
2. Compare observed and projected changes (e.g., due to sea level rise, restoration projects, development, etc.) against the baseline that can form the basis for triggering adaptation actions; and
3. Detect short-term or catastrophic events (such as fish kills), especially given the constantly changing conditions in the Slough.

4.6.1 Review of Existing Monitoring Protocols

There have been over 40 restoration and enhancement projects approved and implemented within the Ecosystem area since 1997 totaling over 175 acres. Appendix B lists these projects that include grant-funded restoration and enhancement projects, volunteer projects and major public works projects (e.g., Runway Safety Area, UCSB housing projects, etc.) that required restoration or enhancement. Many of the regulatory agencies discussed in the Background section of this plan were involved in these projects and applied conditions of approval, including monitoring to ensure success.

Within the Goleta Slough Ecosystem area, the scope of maintenance and monitoring requirements for projects has varied greatly depending on the goals of the particular restoration project and, where construction was proposed, the scale of the project and its mitigation requirements. To

illustrate the variation in maintenance and monitoring requirements, Table 4-2, Summary of Maintenance and Monitoring Requirements for Select Projects, provides a comparison of 15 projects that have occurred in the GSEMP area. These projects varied in size from large (relocating two creeks in the Slough to accommodate a shift in the main runway) to small (repair of a gas line located in a wetland). Information about these projects is provided in Appendix B. The mitigation and monitoring requirements for these projects sometimes include comparisons to reference sites but it is often not clear how reference sites are identified and monitored, particularly given the degraded condition of most southern California estuaries.

**Table 4-2
Summary of Maintenance and Monitoring Requirements
Select Projects and Programs in Goleta Slough Ecosystem Area**

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
PROJECTS				
Goleta Beach County Park 2.0 (2015)	As built approval of revetments and other improvements to beach park (29 acres)	20 years - length of approval (5/14/2015)	<ul style="list-style-type: none"> • Baseline and periodic beach profiles established • Monthly revetment inspections • Annual and mid-term (10 years) monitoring assessments 	<ul style="list-style-type: none"> • Exposure of revetment over time would trigger backfilling with sand & planting with native dune plants • Change to beach/shoreline profiles • Change in public access
Goleta Beach County Park Bridge Replacement (2015)	Replacement of existing bridge leading to Goleta Beach Co Park (1.1 ac impacted)	5 years	<ul style="list-style-type: none"> • General site and biological monitoring data collection all 5 years • Annual report 1st four years and Mitigation Completion Report in year 5 	<ul style="list-style-type: none"> • Restoration of 0.331 ac coastal sage scrub and 0.254 ac of coastal salt marsh • Enhancement of 0.687 ac of coastal bluff scrub and 0.346 ac coastal salt marsh • 2.273 ac of tidal flow restoration and estuarine enhancement
City of Goleta Ekwil-Fowler Road Project (2015)	Two new roads to connect Old Town, Airport & UCSB (0.77 in SB; ±25 ac overall)	5 years	<ul style="list-style-type: none"> • Biological Mitigation & Monitoring • Plan submitted prior to construction • Annual monitoring reports 	<ul style="list-style-type: none"> • Meet requirements of Biological Mitigation & Monitoring plan • Meet requirements of Tree Protection Plan •
UCSB’s Kavli Institute of Theoretical Physics (2014)	35 units for visiting professors (0.05 ac) Tarplant seedbank restoration plan	4 years	<ul style="list-style-type: none"> • Hand weeding • Individual plantings/seeding of annual species 	<ul style="list-style-type: none"> • Photographs and % cover characterization of the whole site • Percent cover of natives must be 80% after 3 years and 90% after 4 years

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
Goleta West Sanitary District Mesa Road Trunk Sewer Relocation (2011 - 2015)	Construction of a new 42" trunk line along Mesa Rd & abandonment of existing 33" sewer line in Storke Wetlands (0.15 ac direct impact)	3 years	<ul style="list-style-type: none"> Plantings monitored semi-annually 1st year & annually in 2nd & 3rd years Establishment monitoring during years 1 and 2 Effectiveness monitoring once vegetation established (years 2 and 3) Noxious weeds monitored for 3 years & removed if found. 	<ul style="list-style-type: none"> Site stabilization Native plant establishment Invasive weed management Open space aesthetics
Airfield Storm Drain Restoration Project (2007-2014)	Wetland maintenance and monitoring during the Airfield Drainage System Rehabilitation Project (3.2 ac)	7 years starting in 2007	Monitored and maintained for 7 years in accordance with the California Coastal Commission Coastal Development Permit	<ul style="list-style-type: none"> Headwall (Bank) Restoration <ul style="list-style-type: none"> Container plants on banks maintained Noxious weeds shall be removed on as-needed basis & shall not exceed % of adjacent undisturbed areas If after 3 yrs the native plant cover is not 75% of pre-project conditions, banks shall be re-planted Seasonal Wetland Areas <ul style="list-style-type: none"> Newly established seedlings shall be maintained Noxious weeds shall be removed from disturbed areas on as-needed basis and shall not exceed that of the adjacent undisturbed areas If after 3 years the native plant cover has not reached 7% of the pre-project conditions, the areas shall be re-seeded Upland Restoration Areas <ul style="list-style-type: none"> Noxious weed cover maintained at less than 20% cover for 3 years following construction Cover by native and naturalized plants shall reach 75% by 3 years
Firestone Channel Restoration Project (2004-2008)	Firestone Channel Improvements Project and restoration (0.95 acres)	5 years; 2004-2008	<ul style="list-style-type: none"> Monitored for 5 years Annual monitoring reports 	<ul style="list-style-type: none"> Planted areas must have 80% survival after the 1st year and 100% survival thereafter Native cover must be 75% after 3 years and 90% cover after 5 years

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
Las Vegas Creek Project (2004-2008)	Las Vegas Creek Improvements and restoration (0.41 ac)	5 years; 2004-2008	<ul style="list-style-type: none"> Restoration must be monitored 2x/year for a min of 5 years 	<ul style="list-style-type: none"> Planted areas must have 80% survival after the 1st year and 100% survival thereafter 75% native cover after 3 yrs and 90% after 5 years
Verhelle Bridge Replacement Project (2006)	Replacement of bridge located off Fairview Avenue and restoration	7 years	<ul style="list-style-type: none"> Monitored and maintained for 7 years Annual monitoring report 	<ul style="list-style-type: none"> Plantings must have a minimum of 80% survival after the 1st year and 100% thereafter 75% native cover after 3 yrs and 90% after 5 years Project site must be without supplemental irrigation for a minimum of 2 years No single species > 50% of the vegetative cover No woody invasive spp shall be present and herbaceous invasive spp shall not exceed 5%
UC Santa Barbara West Storke Wetland Restoration (2006)	Restoration of 1.5 acres of 26-acre Storke Wetland	5 years	<ul style="list-style-type: none"> 6 vegetation transects – 1-meter quadrants every 3 meters with all species identified & cover estimated. Bird monitoring monthly over 1 year. Successful site restoration if 90% cover with native species at end of monitoring period During monitoring period all artificial inputs (e.g., irrigation) shall be removed. If inputs required beyond 1st 2 years, monitoring period shall be extended one year for every additional year inputs required. 	<ul style="list-style-type: none"> Revegetation of native plant species \geq 90% at end of 5 years Submit written monitoring report for 5 years & final detailed report at end of 5 years. Bird monitoring requirements also included in monitoring plan.
Western Goleta Slough Restoration Project on	Restoration of parcel owned by CDFG (part of Goleta Slough Ecological	5 years	<ul style="list-style-type: none"> 3 years maintenance & 2 monitoring. Fall of each of 5 years, germination rate of seeds & survival rate of container plants determined by a sampling protocol to establish the 	<ul style="list-style-type: none"> Qualitative inspection 4x/year & quantitative 2x/year (spring & fall) during maint. period. Spring & fall monitoring for next 2 years including # of container plants that have died. 70% native cover by end of year 3 & retain 70%

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
CDFG land (2006)	Reserve). Project sponsored by Land Trust of Santa Barbara County		<ul style="list-style-type: none"> requirement for replacement planting. • Fixed line transects to sample for: <ul style="list-style-type: none"> ○ Species occurring within transect, species wetland indicator status & whether native or introduced ○ % absolute plant cover & cover of native v. non-native species ○ Depth of water. 	<ul style="list-style-type: none"> coverage by end of 5-year maintenance & monitoring period. • Non-native invasive weeds (excluding grasses) <10% of total cover. • After 5 years, woody or herbaceous invasive species (excluding grasses) shall not exceed 5% cover. • Vegetation must survive w/o irrigation for minimum of 2 years. • No single species shall constitute > than 50% of vegetative cover. • Replacement plants shall be monitored for a minimum of 3 years.
Sempra Line 80 Repair Work (So Cal Gas Co. - 2006)	Inspect and maintain 3,400 linear feet of above-ground and subterranean natural gas pipeline including temporary disturbance of 0.2 acres of salt marsh & adjacent upland habitat.	3 years	<ul style="list-style-type: none"> • Belding's Savannah Sparrow – At least 2 early morning surveys 1 week prior to pipeline work. If 1 or more BSS observed displaying breeding or nesting behavior w/in 300' of project's footprint, work ceases. Work may resume when no breeding/nesting birds in area. • Maintenance monitoring of plants monthly for 1st 6 months, then quarterly through 2nd year. • Performance monitoring conducted at least once per 3 years. 	<ul style="list-style-type: none"> • For pickleweed-dominated areas a min. of 80% total vegetative cover. Of that, at least 80% of cover is native species & a max. of 20% non-native species. • For transition/upland areas a min. of 50% total vegetative cover of which 60% is natives & a max. 40% cover and/or 10% frequency of non-native species. • If performance criteria met sooner, project considered a success & no further monitoring.
City of SB Airport Airfield Safety Projects (2003)	Relocation of main runway 800 feet to the west including rerouting and restoring Carneros and Tecolotito Creeks	7 years	<ul style="list-style-type: none"> • 3 years maintenance & 4 monitoring of plants. • In maintenance period – regularly scheduled maintenance (watering & replanting), formal monitoring inspections 6x/year & annual reports 	<ul style="list-style-type: none"> • Performance criteria differentiated between 4 sites & type of wetland: <ul style="list-style-type: none"> ○ Berms & tidal salt marsh - Min. of 85% natives & max. of 10% non-native weedy species at 7 years. ○ Area I amongst uplands & adjacent to tidal marsh – Min. of 75% natives & max weeds of 10% at 7

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
			for agencies. <ul style="list-style-type: none"> • In monitoring period – As needed maintenance work & formal monitoring 4x/year. • After 7-year program, as needed weeding & formal monitoring inspections 4x/year. • Non-native invasive weeds must remain <15% of total vegetative cover during 7-year maintenance & monitoring period & for perpetuity. • Annual monitoring reports 	years <ul style="list-style-type: none"> ○ Area R-2 amongst upland & wetland grassland mosaic – Same as Area I. ○ New banks of Tecolotito & Carneros Creeks – Min. of 10% natives & max. of 10% weedy species at end of 7 years. • Seeding & plant survival of 70% at end of 1st year & 80% at end of 2nd year. If not met, replanting & reseeding will occur as needed.
City of Santa Barbara Airport Safety Area Grading Mitigation Project (1997)	Grading of areas adjacent to runways and taxiways, some of which was in Goleta Slough Ecological Reserve and GSR Zone.	7 years	<ul style="list-style-type: none"> • 2 years maintenance & 5 years monitoring • Transects throughout site: <ul style="list-style-type: none"> ○ Plant species – Wetland indicator, native or introduced? ○ % absolute plant cover ○ Depth of water or wet soil ○ Soil salinity at surface & 12-15" ○ Soil pH at surface & 12-15" 	<ul style="list-style-type: none"> • Plant survival of ≥ 80% per species • % vegetation cover of a minimum of 40% after 3 years, 45% after 4, 50% after 5, 60% after 6 & 70% after 7 years • Plant species diversity – survival of at least 8 of planted species with no one species > 40% of cover
PROGRAMS/MANAGEMENT				
Goleta Slough Mouth Management (2015)	Management program for Goleta Slough mouth	TBD	TBD	TBD

Applicant & year(s)	Project Description and Acreage	Monitoring		
		Time Period	Monitoring Requirements	Performance Standards
County Flood Control 5-year Maintenance Program (2010)	5-year program for maintenance of creeks, sediment basins, etc.	5 years	<ul style="list-style-type: none"> • Spill Prevention Plan • Water Quality Sampling & Analysis Plan • Restoration/Revegetation Plans • Oak Tree replacement • Raptors & breeding bird monitoring • Marine turbidity plume monitoring • Archaeological site monitoring 	See document.
Goleta Slough Tidal Restoration and Birdstrike Experiment (2003)	Short-term field experiment to increase tidal circulation for wetland enhancement purposes. Creation of small tidal basin & control basin.	3 years	<ul style="list-style-type: none"> • Monitored bird variety & use, vegetation establishment, benthic macro-invertebrates (BMI), tidewater goby, & tidal features (hydrology & water quality) responses to new hydrologic regime. • Initially 2 year experiment but added 3rd year due to inconclusive results relating to bird strike hazard 	<ul style="list-style-type: none"> • Changes in overflights by birds, particularly those called "high-hazard individuals" such as geese, pelicans, etc. considered hazardous to aviation • Increase in average % native plant cover & decrease in non-native cover. • Successful colonization by BMI similar to Tecolotito Creek. • Tidal features (e.g., water quality) within expected range for tidal basins.

4.6.2 Considerations for future monitoring

The review of existing monitoring protocols raises questions that need to be considered in future monitoring programs:

- For any project, consider:
 - What is the question being asked? What specifically is it you want to know? How will monitoring help answer the question?
 - What resources do you have to bring to the task?
 - How will results be stored and tracked so they can be used again in the future?
- Specific consideration should be given to:
 - Be clear in the specification of native species.
 - Choose appropriate metrics to answer specific questions
 - Reference sites are needed to guide and measure the desired future condition.
 - Establish permanent plots to detect long-term vegetation changes at the community level.
 - Monitoring protocols should be specific to each vegetation (e.g., herbaceous v. shrub v. woodland) and habitat type.
 - Monitoring should be tailored to management actions (e.g. containerized plantings should have their own standards as compared to seeded areas) and to habitat type.

4.6.3 Ecosystem-wide protocols for future monitoring

There is a pressing need for a comprehensive, well-designed, and rigorous biological monitoring program to collect information used to guide restoration, adaptation and management actions. This would help address:

- Long term change in environmental variables related to climate change;
- Naturally-occurring events in the estuary which may be overlooked due to restricted physical and visual access to many parts of the Slough;
- Ensure that monitoring occurs in all parts of the Slough including areas that have security restrictions related to the Airport.

Such a program would focus not just on the most vulnerable areas that are changing today, but would look at adjacent areas for possible future restoration and areas to relocate habitats. Such a program would provide consistent long-term information that tells the “story” of the Slough evolution, e.g., sediment accretion in 5-year intervals.

A comprehensive program needs to define the following protocols and set performance standards to trigger adaptive actions:

Physical Performance Standards – Depending on the scope of the project’s impacts or ecosystem monitoring goals, possible physical performance standards could include:

Water Quality. Water quality variables [to be specified] shall be similar to reference wetlands.

Habitat or species survival areas. The area of different habitats or species shall not vary by more than X percent from the areas or species indicated in the final restoration plan.

Tidal Range. Depending on the target species, habitat or ecosystem monitoring goals, the designed tidal range shall be maintained to the maximum benefit of as many species and habitats as possible and consistent with approvals, particularly as it relates to the Goleta Slough mouth.

Biological Performance Standards – Depending on the scope of the project’s impacts or ecosystem monitoring goals, possible biological performance standards could include:

Specific success criteria by habitat type – Rather than looking at the entire mitigation or restoration area, different habitat types should have different requirements, e.g., wetlands, uplands, shrub layers, herb layers, etc.

Native cover – Define what constitutes native cover and whether it is relative or absolute cover. Provide specific standards for each layer or vegetative type, e.g., herbaceous cover standards would likely be different from shrub cover standards. Providing reference sites to show the desired future condition is advantageous.

Biological Communities. Within X years of construction, the total densities and number of species and/or of fish, macro-invertebrates and birds shall be similar to the densities and number of species in similar habitats in the reference wetlands.

Vegetation. The proportion of total vegetation cover and open space in the Slough shall be similar to those proportions found in the reference sites that are determined as part of the mitigation program. The percent cover of algae shall be similar to the percent cover found in the reference wetlands.

Recolonization by invasive species – The proportion of invasive species as defined in the restoration plan shall not exceed X percent. Respond to and eradicate invasive species as outlined in the plan.

Reproductive Success. Certain plant species, as specified in the restoration plan, shall have demonstrated reproduction (i.e., seed set) at least once in X years.

Food Chain Support. The food chain support (to be defined based on the monitoring goals) provided to birds shall be similar to that provided by the reference sites, as determined by feeding activity of the birds.

Exotics. Remove exotic species immediately upon detection.

Maintenance activities and equipment used. Institute cleaning protocols for equipment to prevent introducing weeds into project areas, and to prevent spreading weeds from one area to the next.

Other Standards – Depending on the scope of the project’s impacts or ecosystem monitoring goals, other possible standards could include:

Cultural Resources. Where environmental review process has shown that cultural resources may be present on a project site, provide appropriate studies and monitoring to ensure protection.

4.6.3 Existing and Additional Ecosystem Monitoring Efforts

In the coming years, the triggers or thresholds when adaptation strategies are implemented need to be determined. The baseline for these triggers needs to be established to some degree and should begin with the existing monitoring programs that are listed in Table 4-2 below, subject to site-specific studies and input from experts. Table 4-3 lists additional Ecosystem monitoring efforts that would be needed to begin to create a comprehensive monitoring program.

**Table 4-3
Existing Ecosystem Monitoring Efforts**

Program	Frequency
Vertebrates	
Belding's Savannah sparrow surveys	Typically monitoring tied to mitigation for projects that may impact habitat
White-tailed Kite surveys	Nesting season, roost site documentation
Fish surveys – Tidewater goby, Steelhead trout	Occasional
Shorebirds on beach	Uncertain
Invertebrates on beach	Unknown
Mosquitos	Unknown
Hydrology	Ongoing (if possible)
Water Quality	See these websites: <ul style="list-style-type: none"> • SB County Water Resources Div. (http://cosb.countyofsb.org/pwd/pwwater.aspx?id=2956) • SB City Project Clean Water (http://www.santabarbaraca.gov/gov/depts/parksrec/creeks/default.asp) • SB Channelkeeper (http://www.sbck.org) websites

**Table 4-3
Additional Ecosystem Monitoring Efforts**

Program	Frequency	Data Gathering
Natural Resources	TBD	Inventories of all natural resources in the Ecosystem including terrestrial and aquatic flora and fauna
Physical Processes	TBD	Sediment accretion rates measured using SET tables. Coring could be undertaken to understand historic rates
General bird survey	Monthly at least	Astute observer familiar with the Ecosystem and armed with a checklist of things to be attentive to. The checklist would conform somewhat to the skills of the observer.
Aquatic Species	TBD	These are often the species most affected by Slough changes.

Program	Frequency	Data Gathering
Mammal trapping	Quarterly for 1 year; repeated at some TBD frequency	Permitted trapper who will provide desperately needed baseline information on mammal species present and the condition of the processes that sustain those habitats.
Vegetation Surveys	Quarterly for one year; repeated at some TBD frequency	Establish a system of permanently marked or well-identified baselines for vegetation in different habitat types at “representative areas.” Some of these areas may be found to be suitable to serve as “reference sites” but they will be changing, too.
Water Quality	During dry and wet periods; Weekly or biweekly; and/or continuous	Data loggers should be used when appropriate; Sampling should include water temperature, salinity, Dissolved O ₂ , Nitrate (NO ₃), Total Dissolved Nitrogen, Total Suspended solids (TSS), Total Petroleum Hydrocarbons (TPH), Phosphates, Ammonium (NH ₄), Sediment Cores, metals, conductivity, pH, etc. Dissolved oxygen should be monitored using continuous data loggers placed at various locations and at various depths to accurately detect minimum DO.
Flooding events	During events	Could use tide gauges to provide comparative results (e.g., Atascadero bike bridge v. at the tide gate in the Slough) and pressure transducers to measure water levels, high water marks, extent of depths, velocities, etc. Sediment flow patterns would also be helpful.

4.7 Future Updates to the Plan

The *Goleta Slough Area Sea Level Rise and Management Plan* is an update to the 1997 GSEMP and 2012 *Existing Conditions and Monitoring Report* prepared by GSMC. It also includes a thorough assessment of the Ecosystem’s vulnerability to climate change and sea level rise and potential impacts and adaptations to address these phenomena. This is the first of several studies and plans being done in the area to assess the effects of climate change on habitats, infrastructure and existing land use development.

As mentioned several times in this Plan, this is an informational document and that will hopefully serve as a basis for updates to local and regional agencies’ plans, including those that address SLR vulnerability and potential adaptations, and during the review of proposed projects. Our intent is that, as new information and methodologies become available and plans and studies are completed, where appropriate they will be incorporated or referenced in an update to this Plan, including updating the goals, policies and actions of this Plan. Regardless, as noted in Action A-1.5, our intent is that this Plan will be updated every five years or as needed.

We look forward to working with public interest groups, property owners, local jurisdictions and state and federal agencies to continue to improve this unique Ecosystem for all.