ELKHORN SLOUGH EARLY MITIGATION PARTNERSHIP: WATERSHED/CONSERVATION APPROACH TO MITIGATION FOR TRANSPORTATION PROJECTS

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ABSTRACT

The Elkhorn Slough watershed is located at the center of the Monterey Bay coastline and harbors the largest tract of tidal salt marsh in California outside of San Francisco Bay. Three state highway corridors and many local roads in the watershed are adjacent to areas that support state and federally protected plant and animal species and sensitive natural communities including freshwater and saltwater wetlands. The need for major highway improvement projects in the watershed has been clearly identified by local and state transportation agencies.

The Elkhorn Slough Early Mitigation Partnership (ESEMP) project provides a forum for the creation of partnerships and conservation agreements in order to promote advanced mitigation for transportation projects within the Elkhorn Slough watershed. In 2007, a collaborative partnership was formed between transportation agencies, regulatory agencies, resource agencies and conservation organizations interested in developing a framework for implementing a watershed/conservation-based approach to mitigation for essential transportation projects in Elkhorn Slough watershed.

INTRODUCTION

Compensatory mitigation required for transportation projects has historically been identified on a project-by-project basis. Acquisition of land and implementation of mitigation usually coincides with the construction of individual highway projects. This approach frequently leads to selecting mitigation sites that create fragmented patches of habitat that are more costly to maintain and rarely contribute to the overall conservation needs of the region. Combining mitigation requirements for several projects and then partnering with other government agencies and conservation organizations provides greater opportunity to maximize restoration efforts and preserve ecosystem integrity and function at a landscape-scale level. Early mitigation planning and partnering promotes the sustainability of mitigation efforts and builds confidence with the agencies and the public that transportation systems can be improved while the natural environment is protected and preserved.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (23 USC 507) (SAFETEA-LU) was enacted in 2005. Section 6001 of the law requires transportation agencies to identify future mitigation needs and future mitigation sites in long-range transportation plans through coordination with state and federal agencies early in the planning process, as well as a requirement to consider any available conservation plans, land-use plans, maps, or resource inventories (U.S. Congress 2005).

Project Background

The Elkhorn Slough Early Mitigation Partnership (ESEMP) is a collaborative partnership between transportation agencies, regulatory agencies, resource agencies and conservation organizations working in the Elkhorn Slough watershed. Each of these agencies and organizations recognizes the need for implementing a watershed/conservation-based approach to mitigation for essential transportation projects in the watershed. The ESEMP provides the forum for developing funding strategies and conservation agreements that promote early regional-scale mitigation for multiple transportation projects within the Elkhorn Slough watershed.

In 2005, the California Department of Transportation (Caltrans) Headquarters-Division of Environmental Analysis (DEA) initiated the Early Statewide Biological Mitigation Planning project. The purpose of the 2-year project was to improve the biological mitigation planning process by incorporating a statewide approach to mitigation that encourages long-range (10-year) planning at the district level. There are 12 districts in the state and one of the tasks for the statewide project was to identify districts with an interest in a pilot project. District 5 (D5) proposed the Elkhorn Slough Early Mitigation Partnership (ESEMP), which was selected as one of two statewide pilot projects. Figure 1 shows the location of the Elkhorn Slough and the geographical relationship to Caltrans D5 and the State of California.

From 2006-2010, Caltrans Headquarters-Division of Transportation Planning funded the ESEMP as a pilot project through the State Planning and Research Special Studies Program. Funding was received from the Federal Highway Administration (FHWA) via the Division of Transportation Planning. Caltrans Headquarters provided 20% state matching funds. A contract was initiated with the Information Center for the Environment (ICE) at the University of California, Davis (UCD). Researchers from ICE aided the ESEMP stakeholders by providing data analysis and process support to help create a framework for implementing early mitigation planning for transportation projects.

Figure 1. Location of the Elkhorn Slough Watershed within Caltrans D5 and California

Environmental Setting

The Elkhorn Slough watershed, which occupies 80 square miles in northern Monterey County, harbors the largest tract of tidal marsh in California outside of San Francisco Bay. This ecological treasure provides important habitat for hundreds of species of plants and animals, including more than 340 species of birds (Elkhorn Slough Foundation, 2011). The need for numerous transportation improvements in this well-defined eco-region has been clearly identified by local and state transportation agencies.

Three state highway corridors (State Routes 1, 156, and 101) and many of the local roads in the watershed are adjacent to natural areas that support state and federally protected plant and animal species and sensitive natural communities including freshwater and saltwater wetlands. Not only

will these resources be impacted by future transportation improvements along important routes between northern and southern California; they are also currently threatened by urban growth.

METHODS

Developing a framework for early mitigation planning required a multi-pronged approach involving stakeholders that include ten government agencies, a non-profit organization, and technical support provided by the staff at ICE. Initial work began with delineating a pilot area boundary, creating a stakeholder list, identifying data needs for developing mapping and modeling tools, estimating mitigation needs for multiple transportation projects in the watershed, and identifying potential mitigation sites. Once these tasks were completed and the stakeholder group was formed, regular meetings were held between July 2007 and February 2010.

Delineate Pilot Area Boundary

The ESEMP pilot watershed boundary (Fig. 2) was defined by Caltrans District 5 biologists and Caltrans District 5 GIS specialists. The boundary includes all of the major state and local highways in the Elkhorn Slough watershed. The boundary closely follows the watershed boundary delineated by the California Regional Water Quality Board for this region.

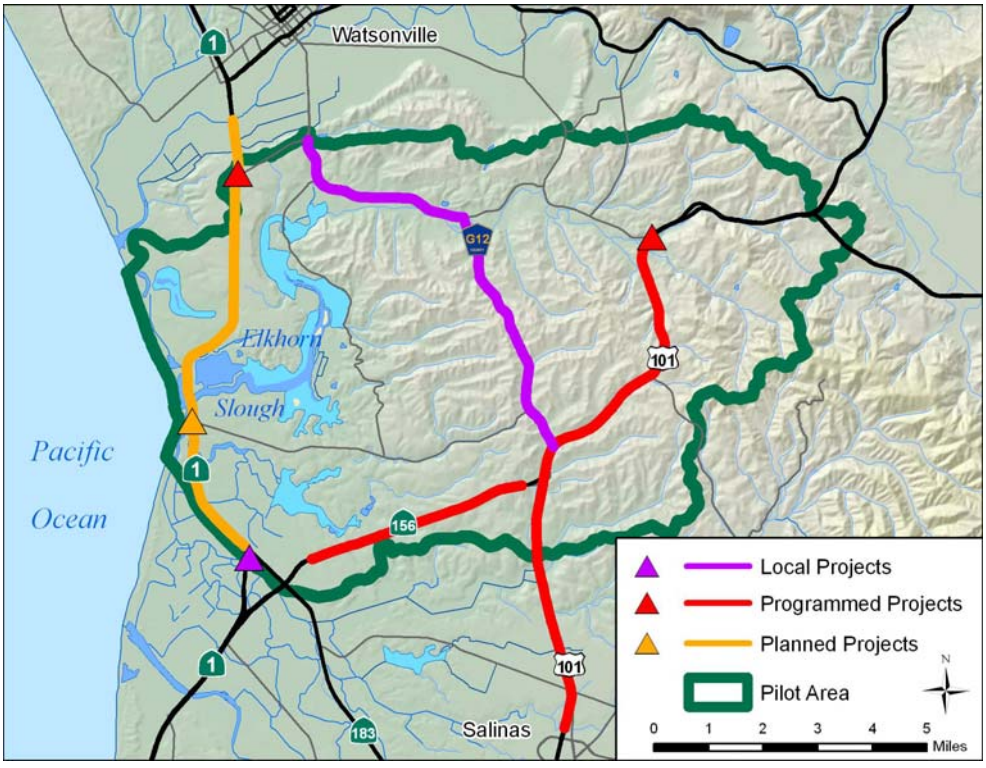

Figure 2. The ESEMP Pilot Project Watershed Boundary

Establish Stakeholder Group and Steering Committee

Caltrans District 5 Environmental Stewardship Branch created a stakeholder list that included the Monterey County transportation agency, Monterey County planning department, federal regulatory agencies, state and federal resource agencies and a non-profit organization involved in conservation and watershed planning within the Elkhorn Slough watershed. Personnel from each agency or organization were invited to an initial meeting in July 2007.

A Steering Committee was formed that includes staff from the following federal, state, and county agencies and a non-profit organization: U.S. Environmental Protection Agency, Federal Highway Administration, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Coastal Commission, California Department of Fish and Game, California Department of Transportation, Central Coast Regional Water Quality Control Board, Transportation Agency of Monterey County, Monterey County Planning Department, and the Elkhorn Slough Foundation (ESF). Other partners who provided invaluable technical support included staff from the Information Center for the Environment (ICE) at the University of California, Davis. ICE facilitated the process and conducted analyses designed to evaluate parcels in the watershed for their mitigation potential and inclusion in the existing watershed reserve network.

Identify Data Needs

The Elkhorn Slough watershed supports a wide variety of habitat types and land uses that are mixed throughout the watershed. Many of the habitat types, such as saltwater marsh, freshwater wetlands, maritime chaparral and oak woodland, support many of the federal and state protected plant and animal species that inhabit the region. Land use in the area includes intensive agriculture, urban areas and residential development that require infrastructure support.

Initial efforts included development of a baseline Geographical Information System (GIS) tool, accomplished by pooling available databases from partners and regional stakeholders. The data elements required included (Girvetz et al. 2008):

- Known locations of threatened and endangered species
- Fine-scale and high quality land cover map
- Existing conservation lands map
- Current development
- Parcel boundary map
- County boundaries
- Location of planned and/or programmed highway projects
- Base map layers including roads, cities, etc.

Calculate Compensatory Mitigation Needs

Caltrans mitigation needs for a 10-year planning horizon were assessed for the Elkhorn Slough watershed. Two approaches were initially used to estimate future mitigation needs based on the estimated impacts of four major transportation projects located along the three state highways in the watershed. The number of transportation projects included in additional analyses changed over time as projects moved ahead of the timeline for inclusion in the ESEMP process and as new projects were identified.

The first approach used preliminary field studies that had been conducted for the four projects in order to identify sensitive habitat types within each project footprint that would be permanently impacted. Based on the field studies, the three major habitat types that would be impacted were central maritime chaparral, coast live oak woodland, and freshwater wetlands.

The second approach, applied to the same four projects, used a GIS analysis of the California Transportation Information System (CTIS) GIS database containing highway centerlines within each project area. The center lines were buffered by 250 meters and the proportion of each habitat type in the buffered area was calculated from the GIS land cover map. The project center lines were then buffered according to the width of typical projects of that type in order to approximate the actual expected project footprints (Fig. 3). The habitat proportions were then applied to this calculated footprint area. This method can be useful if data from field studies are not available (Thorne et al. 2009). Both methods calculated the mitigation needs for each habitat type based on a mitigation ratio of 3:1 for all four projects combined. (Girvetz et al. 2008)

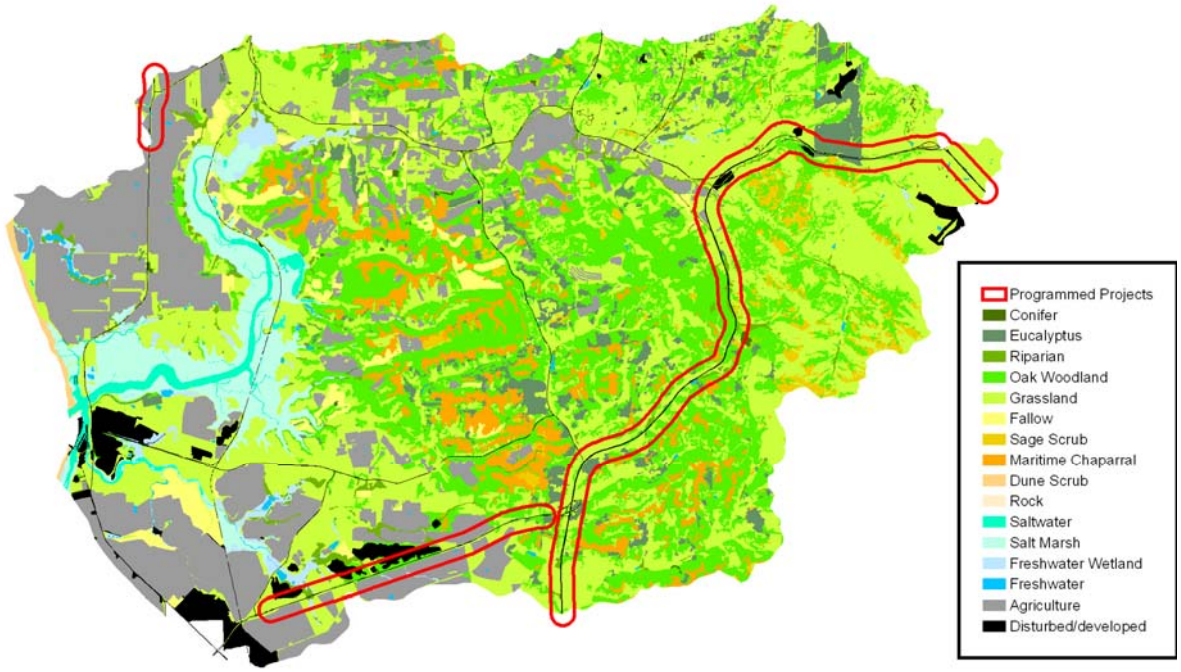

Figure 3. The Four Transportation Projects Buffered by 250 Meters Overlaid on Vegetation Map

Identify Mitigation Sites

Two independent methods were used to identify sites that could potentially meet the mitigation needs for the transportation projects that would be both cost effective and provide an opportunity to contribute to the overall conservation objectives for the watershed.

For the first method, ICE researchers developed a model using MARXAN, a systematic reserve-design and conservation-planning software, to identify potential mitigation sites. The most suitable sites generally had low per/acre costs, were adjacent to conservation areas or provided connectivity to those areas, and contained the land cover types required for mitigation.

Figure 4 shows the final regional analysis for 2008, which depicts both the mitigation targets developed by Caltrans biologist and the conservation targets set by the ESF staff. This map was created using the MARXAN model with a boundary modifier (BM) of 2000. Darker areas are of higher importance for inclusion in the existing reserve plan, while lighter areas are less important (Girvetz et al. 2008). Areas identified as conserved, which are shown in brown, include properties owned by California Department of Parks and Recreation, the Elkhorn Slough National Estuarine Research Reserve, Harbor District property, Monterey County Regional Park, and lands that are managed by the California Department of Fish and Game, ESF and the Nature Conservancy either through fee title or conservation easements.

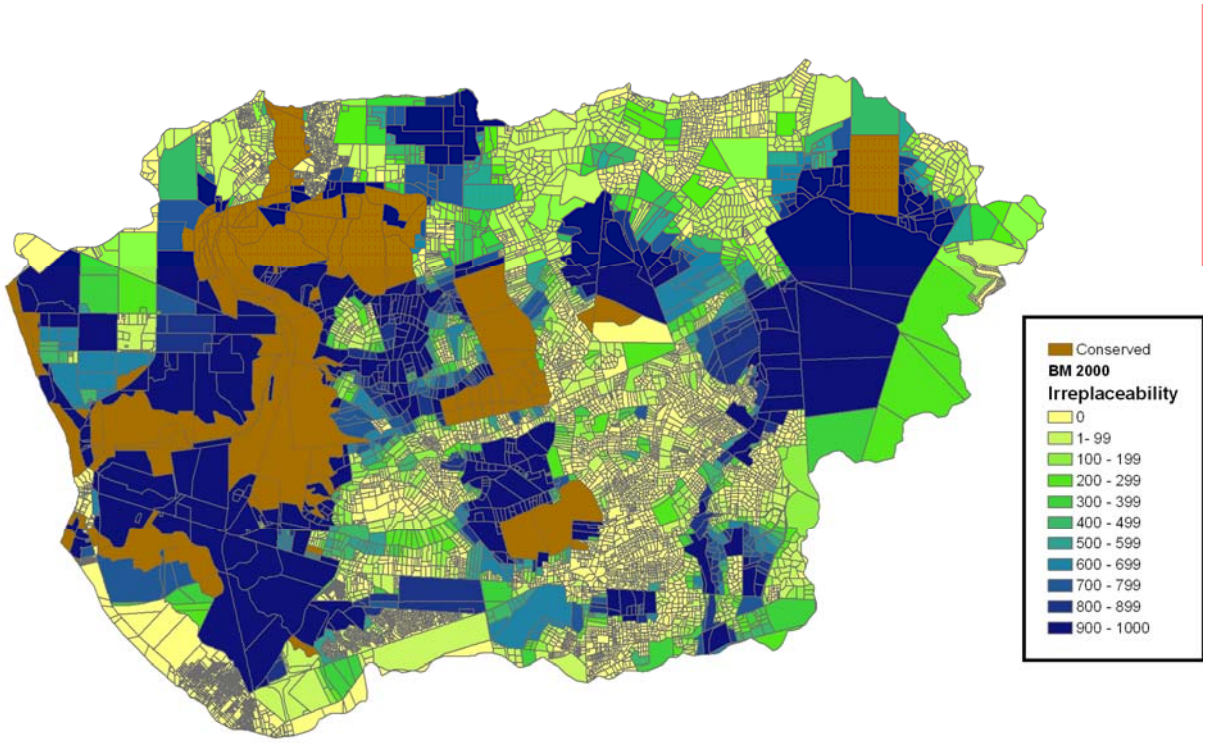

Figure 4. ESEMP Pilot Project Regional Mitigation/conservation Analysis for 2008

The second method, developed by the Elkhorn Slough Foundation (ESF) staff, used the GIS mapping tool developed for the ESEMP combined with personal knowledge of the watershed to create a list of parcels. These parcels were grouped into regions and then ranked according to how well the parcels would: 1) meet the estimated mitigation needs for transportation projects, and 2) overlap with high priority conservation areas identified in the 1999 Elkhorn Slough Watershed conservation plan. The second method provided an opportunity to "ground-truth" the MARXAN model. Independently, the two methods identified many of the same parcels and were in agreement for two-thirds of the parcels that were chosen within the watershed.

In 2010, additional parcels acquired for conservation purposes, three new local transportation projects including a scenic bike trail, and updated information for two of the original major state highway projects were added to subsequent MARXAN analyses (Huber et al. 2010).

Meetings

Between July 2007 and February 2010, meetings were held about every two months. The ESF hosted the meetings, which were held at the Elkhorn Slough Reserve conference room located at the Slough. Taking the time to build trusting relationships was integral to the success of the group. Initial meetings were focused on introducing the concept of early mitigation to the stakeholders, clarifying roles and expectations, and spending time to demonstrate that transportation agencies had an interest in early mitigation to promote environmental stewardship.

Subsequent meetings were directed at developing a framework to identify how early mitigation could be accomplished. One tool that was crafted in the spirit of cooperation and collaboration was a Memorandum of Understanding (MOU) for Early Mitigation Planning for Transportation Improvements in the Elkhorn Slough watershed. In addition to working on the MOU, the analyses that ICE and ESF conducted were used to identify potential mitigation sites and identify the most appropriate type of conservation agreements that would best match the mitigation needs with the watershed needs.

RESULTS

ICE created and maintained a website for posting all ESEMP resources including photographs, maps, project documents and reference materials at elkhornslough.ucdavis.edu. The website is currently being maintained by Caltrans staff.

The Memorandum of Understanding (MOU) promoting the implementation of early mitigation to support conservation efforts in the Elkhorn Slough watershed was signed by all of the participating agencies and ESF in June 2009. The MOU provides an umbrella document that contains policy guidance for the underlying efforts to implement early mitigation that provides a holistic approach.

The current focus is on formally establishing a mitigation bank in the watershed that can be used to offset impacts from future transportation projects that require mitigation. A final mitigation banking agreement will be developed in collaboration with an Interagency Review Team (IRT) coordinated through the U.S. Army Corps of Engineers. The IRT also includes members of the Steering Committee for the ESEMP, which is contributing to continuity for the project.

The ESEMP MOU is being used as a template for a similar MOU that will provide the framework for an advanced mitigation process for all transportation projects in Santa Cruz County. Meetings began in December of 2009 and a draft MOU was prepared for review in June 2010. The same regulatory agencies and resource agencies are involved, however, personnel assigned to participate are not necessarily the same staff who participated in the ESEMP. This is primarily due to geographic boundaries associated with job duties. Although introducing the concept to new participants has sparked enthusiasm, it has also been a challenge when introducing new staff to the concept of advanced mitigation and how it relates to implementing mitigation for transportation projects that can benefit the environment.

Currently, Caltrans Central Region Environmental Planning staff and District 5 Environmental Stewardship Branch are using the parcel list generated by ESF to identify potential sites for offsite mitigation required for unavoidable impacts to California tiger salamander habitat. Caltrans Right-of-Way is in negotiations with a local land owner to purchase a Conservation Easement (CE) on one of the parcels that has habitat for California tiger salamander.

CONCLUSION

The success of the ESEMP can be attributed to several aspects, including:

- Good working relationships among many of the stakeholders already existed prior to Caltrans District 5 initiating the ESEMP.
- Four participants from the regulatory agencies hold liaison positions that are funded through Caltrans headquarters, allowing them to dedicate a significant amount of time to the process.
- The Elkhorn Slough Foundation contributed extensively to the background information needed to identify willing landowners and important resources in the watershed.
- A watershed plan and a well developed resource inventory already existed.
- Consistent stakeholder involvement with little staff turnover added to the cohesiveness of the group.
- Using a consensus-based approach gave all of the stakeholders an equal voice.
- Having a designated organizer and facilitator for the meetings was instrumental in keeping meetings on schedule and encouraging the stakeholders to stay focused on the agenda. Mary Madison and Kevin Ward with ICE worked their magic wands to support this.
- Providing a “working lunch” was a great incentive for participation in the ESEMP.
- Providing a pleasant meeting location at the Elkhorn Slough Reserve was also important.

The ESEMP is continuing to facilitate the integration of regional conservation plans into early mitigation planning and project development by advocating environmental stewardship at the watershed level. Early planning maximizes mitigation efforts by coordinating mitigation with larger conservation strategies that provide potential for ecological sustainability, habitat connectivity, enhancement and protection for many natural resources in the watershed. In addition, early mitigation for multiple transportation projects promotes a more efficient expenditure of public funds by consolidating the costs associated with mitigation sites into larger sites that can be more effectively managed with resources from more than one project or partner.

In 2008, the Transportation Agency for Monterey County awarded the California Department of Transportation the Transportation in Excellence Award for their participation in the ESEMP. In 2009, the Federal Highway Administration awarded the ESEMP the Exemplary Ecosystem Initiative. In 2010, the ESEMP was one of the finalists for the Tranny Awards sponsored annually by the California Transportation Foundation. An article about the ESEMP was published in the July 2010 issue of the Reporter published by The American Public Works Association.

The ESEMP supports Caltrans Headquarters' Division of Environmental Analysis continued statewide early mitigation planning efforts. The processes developed by the ESEMP are serving as a model for the implementation of similar programs in other regions around the state and nation.

ACKNOWLEDGEMENTS

The ESEMP was truly a collaborative effort and we would like to thank all of our partners which includes the following agencies and individuals: Tami Grove and Lee Otter, California Coastal Commission; Laura Peterson-Diaz and Julie Vance, California Department of Fish and Game; Dominic Roques, California Regional Water Quality Control Board Central Coast Region; Kevin Contreras and Mark Silberstein, Elkhorn Slough Foundation; Larry Vinzant, California Division Federal Highway Administration; Liz Gonzales, Monterey County Planning Department; Joyce Ambrosius, National Marine Fisheries Service; Mike Zeller, Transportation Agency for Monterey County; Patrick R. Huber, Evan H. Girvetz, Mary Madison, Jim Quinn, James H. Thorne, and Kevin Ward, U.C. Davis, Information Center for the Environment; Steve Kirkland and Jacob Martin, U.S. Fish and Wildlife Service-Ventura Field Office; Melissa Scianni and Susan Sturges, U.S. Environmental Protection Agency, Region 9 (Fig. 5).

We also would like to thank the management of each of the agencies and organizations participating in ESEMP for dedicating valuable staff time and for enthusiastically supporting the final Memorandum of Understanding.

Figure 5. ESEMP partners with the TAMC 2008 Transportation Excellence Award

Front row left to right: Tami Grove, Kevin Ward, Nancy Siepel, Mary Madison, Gary Ruggerone holding award, and Liz Gonzales. Back row left to right: Joyce Ambrosius, Mike Zeller, Kevin Contreras, Steve Kirkland, Mark Silberstein, Larry Vinzant, Dominic Roques and Susan Sturges.

BIOGRAPHICAL SKETCHES

Nancy Siepel received a Bachelor of Science (emphasis Vertebrate Zoology) from Northern Arizona University in 1976. She continued her education at Cal Poly San Luis Obispo taking courses over the next 10 years relevant to her professional interests as a biologist. Nancy began her career working for the California Department of Fish and Game in the Marine Resource Division from 1980- 1986. From 1987-1993 she worked for the U.S. Fish and Wildlife Service as a member of a team conducting research on the southern sea otter, California red-legged frog, two-striped garter snake, tidewater goby and western pond turtle. After a six year stint in the private sector working as a consultant, Nancy began her career with Caltrans District 5 as an Associate Environmental Planner (Natural Resources) in 1999. Her interest in developing partnerships to collaborate on advanced mitigation began when she worked as the Caltrans lead biologist on four major transportation projects in the Elkhorn Slough watershed. For the past five years she has worked in the Environmental Stewardship Branch promoting the concept of advanced mitigation for transportation projects throughout the district using the ESEMP as a model. Nancy is also involved in district wide issues that relate to wildlife connectivity. She recently initiated a project to develop a wildlife connectivity plan for District 5.

Gary Ruggerone received a BS in Biology (emphasis in Marine Biology) from Cal Poly Pomona in 1973 and an MA in Biology (emphasis in Aquatic Biology) from UC Santa Barbara in 1975. He was an Environmental Planner for Caltrans District 5 in San Luis Obispo from June 1980 until December 2010. Gary was the Chief of the District 5 Environmental Stewardship Branch and supervised a staff of six professional environmental planners in the preparation of

NEPA and CEQA environmental documents, environmental technical studies, and obtained regulatory permits for transportation projects in Santa Barbara, San Luis Obispo, Monterey, San Benito, and Santa Cruz counties. In 2000, Gary initiated discussions with Elkhorn Slough Foundation and The Nature Conservancy on an "early mitigation" partnership to identify conservation opportunities in the Elkhorn Slough Watershed that could serve as advanced mitigation for transportation projects on State and local roads in the watershed. That effort led to the Elkhorn Slough Early Mitigation Partnership (ESEMP) in 2007. In 2009, Gary received the FHWA Environmental Excellence Award for Environmental Leadership. Gary is currently the Principal Environmental Planner for Piedra Environmental Consultants in San Luis Obispo, California.

REFERENCES

Elkhorn Slough Foundation, access date June 29, 2011, http://www.elkhornslough.org/

Girvetz, E. H., J. H. Thorne, J. F. Quinn, and M.C. McCoy. 2008. *Early biological mitigation needs assessment Elkhorn Slough pilot project: Caltrans final report*. Information Center for the Environment, University of California Davis, Davis, California USA.

Thorne, J.H., P.R. Huber, E.H. Girvetz, J. Quinn, and M.C. McCoy. 2009. Integration of regional mitigation assessment and conservation planning. *Ecology and Society,* 14(1):47.

Huber, P. R., J. H. Thorne, M. E. Madison. 2010. *Marxan Analysis for the Elkhorn Slough Watershed: Mitigation Planning and "Ideal" Reserves: Caltrans final report*. Information Center for the Environment, University of California Davis, Davis, California USA.

U.S. Congress. 2005. *Safe, accountable, flexible, efficient transportation equity act: a legacy for users (SAFETEA-LU).* Washington, D.C., USA.

BIBLIIOGRAPHY

Brown J. W. 2006. *Eco-logical: an ecosystem approach to developing infrastructure projects.* Office of Project Development and Environmental Review. Federal Highway Administration, Washington, D.C., USA.

Memorandum of Understanding for Early Mitigation Planning for Transportation Improvements in the Elkhorn Slough Watershed. 2009.

The California Department of Transportation, District 5, and the Elkhorn Slough Foundation. *Shared Goals and Partnership Opportunities. June 2002.* Caltrans District 5, San Luis Obispo, California, USA.

University of California, Davis, access date June 29, 2011, http://elkhornslough.ucdavis.edu