

Purpose

The Board of Supervisors authorized the Department of Public Works to begin implementation of a County-wide Watershed Program on May 13, 2008. The purpose of the Watershed Program is to provide a framework to integrate flood protection and environmental restoration with public and private partners to protect and enhance Marin County's watersheds. In the Las Gallinas Creek Watershed, this program would seek to identify opportunities that provide the following benefits:

- Develop cost effective solutions to reduce flooding damages that threaten communities, local economies, and public services
- Improve navigational access to lower Las Gallinas
- Protect, enhance and restore sensitive creek and wetland habitat and water quality
- Identify multi-benefit type projects that will improve the County's ability to compete for State and Federal funding
- Identify projects that are resilient to sea level rise
- Evaluate the beneficial re-use of dredged material for wetland restoration, levee maintenance and shoreline protection within lower Las Gallinas and Miller Creek
- Reduce ecological impacts of flood maintenance activities

The Las Gallinas watershed program would identify and describe the recommended watershed improvement measures and provide details on project feasibility, sequencing, preliminary costs and funding strategies. It is anticipated that some type of revenue measure will be required to implement the recommended measures.

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Background

The 5.6 square mile Gallinas Creek watershed has two main drainage basins. The north fork is the larger of the two drainages and flows from the ridgeline through Santa Margarita Valley and the community of Terra Linda to its confluence with South Gallinas Creek near McInnis Park. South Gallinas Creek is fed by several small tributaries that originate in the San Rafael Hills and San Pedro Ridge and flow through the communities of San Rafael Meadows, Los Ranchitos and Santa Venetia.

Las Gallinas Creek – North Fork

During the construction of the Terra Linda housing development in the late 1950s and 60s, portions of Gallinas Creek and its tributaries were channelized and lined with concrete. The subsequent loss of creek habitat contributed to the extirpation of steelhead within the watershed. The concrete lining of Gallinas Creek generates high water temperatures, which leads to excessive algal growth and poor water quality entering the Gallinas Creek Slough.

Moving downstream of Highway 101, development becomes progressively denser, with the lowland areas east of Highway 101 supporting neighborhoods, industrial and commercial development. Portions of these lowland areas are within FEMA's mapped 100 year flood plain. While these areas may not have been impacted from the floods of 2005/06, sea level rise poses a potential threat to this area. There have been local efforts to restore wetlands in this area. Audubon completed a small wetland restoration project on State Lands during the 1990s. The north fork of Gallinas Creek joins the south fork at McInnis Park.

Las Gallinas Creek – South Fork

There are two designated County Flood Zones that drain to the south fork of Gallinas Creek: Flood Zone #6 and Flood Zone #7.

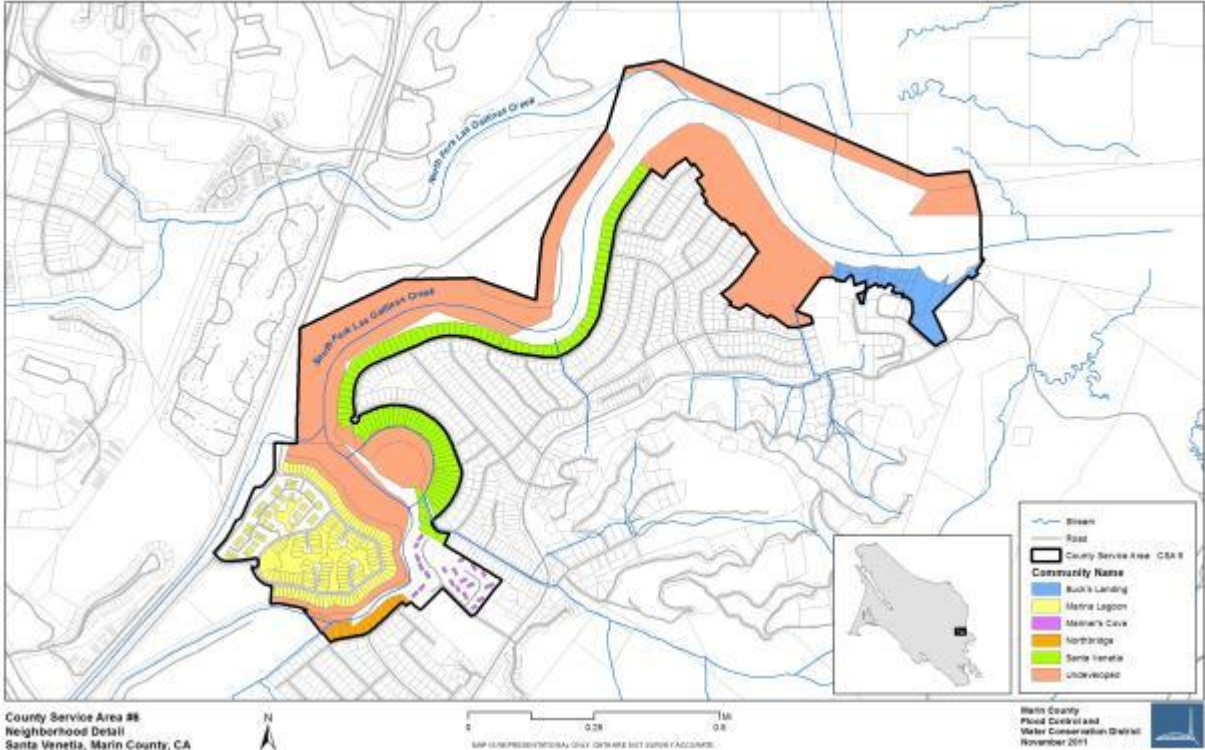
Flood Zone #6 was established after construction of the San Rafael Meadows subdivisions in the 1960s. This is a very small zone located just west of Highway 101 across from the County Civic Center. Houses were built in a low-lying area and experienced frequent flooding until improvements were made. In the early 2000s, during the construction of a new subdivision project a majority of the stormwater causing the flooding was rerouted around the community eliminating a significant cause of flooding in the zone. In addition, this area was annexed by the City of San Rafael, who now owns and maintains all the Zone's drainage facilities.

Flood Zone #7 is comprised of the unincorporated community of Santa Venetia, east of 101 along San Pedro Road. It was one of the first developments in Marin County to be constructed on fill over bay mud and occurred in an era before the County had the authority to regulate or control development. Due to the low initial elevation of the fill and the compressible nature of the underlying bay mud, the area has subsided and is now below the high tide level. To protect themselves from tidal flooding of Las Gallinas Creek, the residents of Santa Venetia formed Flood Control Zone #7 in 1962. The annual maintenance program for facilities includes pump stations and levees, as well as other drainage facilities in the Zone.

Though the Santa Venetia neighborhood did not flood during the 2005 New Year's Eve storm, sea level rise, land subsidence and aging infrastructure remain flood protection challenges. Stormwater is collected via pipes and discharged into Las Gallinas Creek via a series of five pump stations. Four million dollars of potential flood protection improvements have been identified within Santa Venetia alone. The most pressing identified infrastructure need in Santa Venetia is the replacement of Pump Station No.2. It is recommended that the pump be rebuilt to improve its reliability and to increase its pumping capacity to handle the 100-year storm event (It currently can handle flows up to the 10-year event.) A special election was held in 2010 to fund flood protection

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improvements in Flood Control Zone 7 including the replacement of Pump Station No. 2, improvements to Estancia Ditch, and additional levee studies. The tax measure was not approved. The District is now investigating the feasibility of pursuing revenue sources for the replacement of Pump Station No. 2.



Homeowners along the tidal reaches of Gallinas Creek also desire creek access and a navigable channel. The community formed CSA #6 (see figure above) in the 1960s to dredge the channel for navigation and flood protection. The community is working to raise the funds to perform another round of maintenance dredging. Preliminary plans and cost estimates have been developed. The estimated dredging construction costs exceed funds available and will require additional funds to implement.

Mouth of Las Gallinas Creek

The mouth of Las Gallinas Creek is bordered by County and State Park lands. The beneficial re-use of sediment from the dredging of Las Gallinas Creek could be used to restore diked baylands to functional tidal marsh. The Army Corps of Engineers prepared a preliminary restoration plan for the McInnis Park Wetland Restoration Project in 2001, under Section 206 WRDA 1996 as an element of the San Pablo Bay Watershed Restoration Plan. Suggested restoration actions include levee breaching, marsh plain and channel grading and invasive species removal. Tidal marsh restoration in the Gallinas Creek system would restore ecosystem function and processes, as well as provide critical habitat for the endangered California clapper rail and salt marsh harvest mouse. The opportunity exists to evaluate alternatives that could improve any project’s resiliency to predicted sea level rise scenarios.

Stakeholder Outreach

The watershed program will utilize a collaborative, iterative process to develop an integrated flood protection and habitat restoration program. The Marin County Board of Supervisors recommended establishing

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stakeholder committees at three levels to support community outreach and to provide overall program direction (*a complete list of recommended committee members is included at end of this document*). A broad community outreach program is also recommended.

Community outreach will be developed around two key messages:

- 1) The watershed approach is the practical and desired alternative to identifying cost effective solutions for improving flood protection; and
- 2) Implementation at the watershed scale takes time and does not take precedence over the maintenance and rehabilitation of aged existing infrastructure.

Description of Watershed Stakeholder Committees

Policy Advisory Committee - This group of elected officials is comprised of the District County Supervisor, two representatives from the participating city council and the Board of Directors of the participating agencies. This committee provides policy input on program direction and community issues and will meet 1-2 times per year.

Operations and Finance Committee- The participating District manager and/or city manager and the Marin County Public Works director will use these meetings to evaluate progress and prioritize funding strategies and will meet 3-4 times per year.

Technical Working Group- This group will include staff of participating State, Federal and local regulatory and participating agencies and community members with a science and technical background. The group will be responsible for the review of watershed products and provide input on issues, needs and watershed priorities. This group will include conservation and watershed groups, homeowners associations and other technical experts within their respective watersheds. This group will meet at least quarterly to provide input and to review the development of work products

Community Outreach

Targeted community meetings, presentations at various local boards and homeowners associations and utilization of the watershed program website (www.marinwatersheds.org) will support communication to the community at large. The program website provides dedicated information about the watershed and is regularly updated with notices about workshops, meetings, proposals and projects.

Program Description and Outcomes

The Watershed Program will build upon existing studies and develop new analytical tools to evaluate and quantify the extent of flooding and to evaluate the range of proposed solutions. This process will be summarized in a final report. The final report will also include recommendations for leveraging local funds to attract State and Federal grant funds and describe the type of local revenue measures that could support project implementation.

The following is a description of the proposed tools and outcomes. An excellent overview of existing conditions and relevant studies is available at www.marinwatersheds.org.

Analytical Tool Development

The District has identified the general causes of flooding within the watershed but focused modeling and analysis will provide the ability to refine the engineering analysis required to develop conceptual designs for improvements and to get a better idea of the costs associated with implementation.

The following tools will assist with the identification and review of a range of alternatives:

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Hydrology and hydraulics models - An understanding of how much water is moving through the watershed (hydrology), how fast it moving and where it is going (hydraulics) is critical to quantifying flooding impacts and identifying solutions. The development and use of computer models to quantify stormwater runoff and channel flow are the industry standard used to describe flooding. These modeling tools will allow us to identify areas that need increased flood protection and to understand how channel and floodplain modifications will influence the ability of the channel to carry flood flows.

Flood Zone 7 is actively engaged in a process with the Army Corps of Engineers (ACOE) to evaluate the levees that protect Santa Venetia. As part of this evaluation, the ACOE developed the following types of models:

- A hydrology model that develops flood flows from the watershed into the north and south forks of Las Gallinas Creek.
- A hydraulics model for the south fork of Las Gallinas Creek that evaluates both tidal and creek water surface elevations under flood flow conditions
- In addition, the Corps performed an evaluation of direct coastal flooding impacts under current and 50-year sea level rise conditions

Additional model refinements may be driven by the alternatives analysis.

In addition to the creek channel models described above, there are also specific stormwater models to evaluate flow in low-lying developed areas where the majority of flow is routed via roads and a storm drain system to pump stations. This type of model could be useful for evaluating storm flows in Santa Venetia because flood control practices rely on an underground storm drain system, pump stations and three direct stormwater bypasses to deliver runoff to Las Gallinas Creek. A stormwater drainage system model for Flood Zone #7-Santa Venetia could improve the efficiency of pump operations by providing information on pumping capacity and to evaluate the optimal distribution of flows to the five pump stations. This type of modeling would also evaluate stormwater pipe capacity and identify constriction points.

At the end of this phase, we will have a watershed based hydrology and hydraulics models of Las Gallinas Creek and limited tributaries that will allow us to review conceptual project alternatives for their benefits including an evaluation of sea-level rise scenarios.

Geomorphic and Sediment Assessment in Tidal Areas - Levees bordering lower Las Gallinas Creek have greatly reduced the tidal prism (volume of water that moves in and out on each tide cycle) thereby reducing the

Schedule

2012

Jan: Meeting with Supervisor Adams to present Outreach Strategy

Staff begins to implement outreach strategy

Meetings with stakeholders

Feb: Flood Zone Advisory Board meeting
SVNA community meeting

April: Technical work group meeting #1

May: Flood Zone Advisory Board meeting

Jun: Technical Work group meeting #2

July: Initiate watershed specific studies

Technical work group meetings and watershed related work thru Dec 2013

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ability of the channels to transport sediment out of the system. This has resulted in sediment deposition in the tidal reaches of the creek and a loss of depth for boating access. This assessment will seek to identify a channel width and alignment that maximizes the creek's ability to transport sediment to the Bay based upon geomorphic analysis of similar systems in the Bay. This information will be used to inform future creek dredging needs and extent of dredging.

GIS-based mapping and database development- A geographic information system database will be developed to evaluate opportunities to restore creeks and wetlands. Existing data will be used to develop a watershed-scale database and maps to assist with project prioritization.

Conceptual Alternatives Development

One of the primary goals of the watershed program is to identify cost effective alternatives for maintaining or improving the level of flood protection. Utilizing the tools developed through the watershed program the District and the community will be able to evaluate a range of alternatives to identify practical and sustainable projects. The models will be used to analyze and develop the full range of feasible measures consistent with the program goals. Preliminary costs, flood protection benefits and habitat impacts and/or enhancements will be clearly identified through this process.

The watershed approach considers the development of multi-benefit projects as a basic tenet to ensure that project priorities are eligible for the broadest range of funding at the State and Federal levels.

Final Report

This document will describe the identified alternatives and documentation for each. Maps and graphics will support this analysis and the report will include recommendations and process for pursuing implementation, establishing priorities and funding.

Program Budget

Expenditures	Cost
Calibration of USACE Hydrology Model	\$10,000
Surveying	\$30,000
Hydraulic modeling	\$45,000
Stormdrain modeling (<i>SV only</i>)	\$50,000
Geomorphic/Sediment Study	\$20,000
Alternatives analysis	\$50,000
Final Report	\$35,000
Stakeholder Outreach	\$47,500
<u>Polling</u>	<u>\$20,000</u>
Total	\$307,500

Revenue

County of Marin	\$80,000
City of San Rafael (<i>proposed</i>)	\$80,000
Flood Zone 6	\$12,500
Flood Zone 7 (<i>proposed</i>)	\$80,000
CSA 6	\$60,000
<u>Las Gallinas Valley Sanitary District</u>	<u>\$80,000</u>
Total	\$392,500

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Status of Local Agency Participation

To date we have received commitment and financial support from the following agencies:

- County of Marin
- Las Gallinas Sanitary District
- County Service Area 6
- Flood Zone 6

We are still pursuing commitment and financial participation from the following agencies:

- City of San Rafael
- Flood Zone 7

Recommended list of committee members

Policy Advisory Committee (PAC)

Supervisor Susan Adams

City of San Rafael council member: to be determined (tbd)

Las Gallinas Valley Sanitary District: Judy Schriebman

Flood Zone 7 Advisory Board: Michael Perani and tbd

CSA 6: tbd

Operations and Finance Committee

Mark Williams, General Manager-Engineer, Las Gallinas Sanitary District

City of San Rafael-tbd

Craig Tackabery, Assistant Director of Public Works, County of Marin

Technical Working Group

City of San Rafael: Public Works Kevin McGowan

Las Gallinas Sanitary District: Mark Williams

Flood Zone #6: Board Chair or their delegate

Flood Zone #7: Board Chair or their delegate

Marin County Flood Control District: Tracy Clay, Neal Conatser

County of Marin Community Development Agency: Tom Lai

State Coastal Conservancy: Tom Gandesbery

Marin County Open Space District: Elise Holland

Las Gallinas Creek Watershed Council: Emily Dean, Russ Greenfield?

Marin Sonoma Mosquito Abatement District: Erik Hawk

Marin Municipal Water District: tbd

SMART-John Nemeth

Santa Venetia Neighborhood Association: tbd

Contempo Marin homeowner representative

Marin Lagoon homeowner representative

North San Rafael Coalition of Residents: tbd

State and Federal Resource agencies: Army Corps of Engineers, BCDC, Regional Board, Department of Fish and Game

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Public Works Watershed staffing

Primary roles and responsibilities:

Liz Lewis, Principal Planner

- Manage overall schedule, deliverables, and budget; coordinate communication with partners and County Departments

Roger Leventhal, Associate Engineer

- Manage technical consultant team and peer review of Army Corps products such as the H&H modeling and related products.

Neal Conatser, Assistant Engineer

- Manages Army Corps modeling effort and the County's levee studies; manages the cost sharing agreement with the Army Corps of Engineers.

Hugh Davis, Associate Engineer

- Assist with conceptual levee design and geotechnical review

Chris Choo, Senior Planner

- Coordinate meetings public outreach through the website and with stakeholders.

Laurie Williams, Senior Planner

- Develop GIS database to support project planning. Prepare maps for website and stakeholder meetings.

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