

TOWN OF FAIRFAX FLOOD MITIGATION PLAN



June 2008

RESOLUTION NO. 2555

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF FAIRFAX ADOPTING THE "TOWN OF FAIRFAX FLOOD MITIGATION PLAN" AS AN OFFICIAL PLAN, AS AN ADDENDUM TO THE TOWN OF FAIRFAX LOCAL HAZARD MITIGATION PLAN, AND AS AN APPENDIX TO THE UPDATE OF THE TOWN OF FAIRFAX GENERAL PLAN ENVIRONMENTAL SAFETY ELEMENT UPDATE

WHEREAS, the Town of Fairfax recognizes the potential threat of flood disasters and hazards to people, property and the environment in the Town of Fairfax; and

WHEREAS, the Town of Fairfax has been faced with overbank flooding and drainage problems over the years that have flooded buildings, and resulted in economic impacts; and

WHEREAS, the Town of Fairfax received a Flood Mitigation Planning Grant from the Federal Emergency Management Agency to develop a Flood Mitigation Plan for the Town of Fairfax; and

WHEREAS, the Town of Fairfax has developed the Flood Mitigation Plan consistent with the federally prescribed planning process for the development of the Flood Mitigation Plan working with the Town of Fairfax Disaster Council and the Community; and

WHEREAS, the Town of Fairfax seeks to maintain and enhance a disaster resistant community by reducing the potential loss of life, property damage, and environmental degradation from floods, while accelerating economic recovery from those floods;

NOW, THEREFORE BE IT RESOLVED, that the Town of Fairfax Town Council hereby adopts the "Town of Fairfax Flood Mitigation Plan" as an official Plan, as an Addendum to the Town of Fairfax Local Hazard Mitigation Plan, and as an Appendix to the Update of the Town of Fairfax General Plan Environmental Safety Element Update; and

BE IT FURTHER RESOLVED that the Town of Fairfax shall submit this Adoption Resolution to the Governor's Office of Emergency Services and the Federal Emergency Management Agency, Region IX for Approval of the Town of Fairfax Flood Mitigation Plan.

The foregoing Resolution was duly passed and adopted at an Adjourned Meeting of the Town Council of the Town of Fairfax held in said Town on the 18th day of June, 2008, by the following vote, to wit:

AYES: Bragman, Brandborg, Maggiore, Tremaine, Weinsoff
NOES: None
ABSENT: None

_____(Original Signed_____
MARY ANN MAGGIORE, MAYOR

Attest:

_____(Original Signed)_____
Town Clerk

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Executive Summary

The Town of Fairfax Flood Mitigation Plan presents a comprehensive strategy to guide community efforts designed to reduce the damage, loss and disruption from future flood events. Hazard mitigation is defined as any sustained action taken to reduce or eliminate long term risk to human life and property. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition it can protect critical community facilities, reduce exposure to liability and minimize community disruption.

Following the December 31, 2005 floods that caused extensive damage to Town facilities, businesses, residences and other property, the Town applied for and received a grant from the Federal Emergency Management Agency (FEMA) to develop a Flood Mitigation Plan. This plan has been prepared in compliance with all federal grant and program requirements as outlined in 44 CFR Section 78.5.

In accordance with those requirements, the Plan is organized into six sections. A brief description of each section is included below, followed by a summary of the Plan objectives and highest priority mitigation strategies.

Section 1: Introduction to the Plan and Community Background

The primary purpose of this plan is to identify community policies, actions and tools for implementation over the long-term, which will result in a reduction in risk and potential for future flood losses community-wide. This is accomplished by using a systematic process of learning about the flood hazard that can affect the Town of Fairfax, setting clear goals, identifying and implementing appropriate actions, and keeping the plan current.

This Plan is consistent with and supports the objectives of other existing or on-going planning efforts including the Update of the General Plan, Environmental Safety Element, the Local Hazard Mitigation Plan, and the Emergency Operations Plan

Section 2: Description of the Planning Process

The Town of Fairfax Flood Mitigation Plan is the culmination of several planning efforts initiated to address the flood hazard in the Town of Fairfax: the Ross Valley Watershed Flood Protection and Creek Restoration Program (RVWP), the Local Hazard Mitigation Plan (LHMP), and the Update of the General Plan Environmental Safety Element (ESE). This section describes each of those planning efforts and how they have contributed to the development of this Flood Mitigation Plan, and documents the planning process carried out under this Flood Mitigation Assistance Grant.

Section 3: Flood Risk Assessment

This section describes the community flood risk, including general details of the watershed, a summary of flood history and documented damages, and results of several technical studies that have been conducted that contribute to an understanding of the causes of flooding.

Fairfax is impacted by significant flooding every ten to twenty years. Flooding generally occurs during periods of heavy rainfall when soils are already saturated and the capacity of the creek, culverts and channels are exceeded. The downtown Fairfax culvert is most frequently cited as the major cause of widespread flooding. However, other culvert and drainage problems result in smaller, more localized flooding.

Section 4: Capability Assessment

The Town of Fairfax can use a variety of different tools, assets, and authorities to effectively reduce or mitigate the impacts of floods in the community. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches.

The capabilities available to the Town of Fairfax fall into the following broad categories: Agencies and People, Plans, Codes and Regulations, Programs and Mitigation Activities, and Financial Resources. This capability assessment reviews how the Town uses each of the capabilities available to mitigate its flood risk.

Section 5: Goals, Objectives and Strategies

This Section includes a listing of all mitigation strategies considered for inclusion in the Plan, and a description of the prioritization process. Those mitigation actions ranked as the highest priority are included in the Implementation Strategy. (See below for a listing of the high priority mitigation activities.)

Section 6: Plan Maintenance Process

This Section describes the process the Town will use to monitor, evaluate and update the Plan, as required by federal regulations. The Town Manager will be responsible for conducting an annual review of mitigation activities included in the Implementation Strategy to determine progress, changes in priorities, or new initiatives to be included in the next update of the Plan. The Town will continue to involve the community in the plan update process through public outreach via the Town website and community workshops.

Summary of Goals, Objectives and Strategies

Overall Goal:

To reduce personal injury, loss of life, and damage to property and the environment from flood hazards.

Objective 1: Assure that adequate and up to date flood hazard information and maps are available and utilized to guide decisions that impact flood vulnerability, exposure, and risk.

- Review newly released Flood Rate Insurance Maps, make map information available to the public and ensure the most up to date information is used for permit and plan review.
- Complete the hydrologic study for Fairfax Creek.
- Document and maintain creek depth monitoring data during significant storm or flood events to contribute to the understanding of the flood hazard.
- Document past flood history and damages to quantify flood impacts and support benefit cost analysis of flood mitigation measures.
- Complete identification and mapping of high water marks from the December 31, 2005 flood and enter into Geographic Information System maintained by Marin Maps.

Objective 2: Update and enforce Town codes and ordinances to minimize the risks of flood hazards.

- Ensure that drainage systems in new or substantially improved development are designed and constructed to reduce off-site flow and encourage the use of permeable paving and on-site stormwater retention.
- Ensure that storm drainage systems are adequate to accommodate new development and substantial improvements by requiring owner to pay the cost of any required improvements to the existing drainage system necessitated by the proposed development.
- Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring that lots and rights-of-way are laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. Design criteria should be calculated based on saturated soils.

Objective 3: Reduce community risk and vulnerability through maintaining and improving drainage systems.

- Repair damaged culverts, drains, and bridges to withstand future flooding and incorporate streambank erosion and fish passage solutions.
- Conduct an inventory and analysis of town maintained storm drains and culverts, including age, size, materials, etc. Determine any inadequacies in meeting current capacity needs, and prioritize necessary improvements. Prepare a Storm Drain Master Plan.
- Locate and mark all storm drains/culverts and identify area and properties draining into each.
- Continue maintenance efforts carried out by the Public Works Department to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate), to allow for free flow of water.
- Continue to support community volunteer efforts prior to and during the rainy season to monitor creeks and drainage culverts and remove visible obstructions.

Objective 4: Increase the mitigation capability of residents, business owners and others who could be affected by floods.

- Continue to hold the annual community creek clean up day prior to the winter storm season..
- Identify and aggressively seek available grant funds to support residential and commercial elevation projects and projects that decrease runoff and increase stormwater detention.
- Provide financial incentives, technical guidance and a public outreach campaign for commercial business owners to install flood gates at the entrance to their property.

Objective 5: Increase the Town's capacity to respond to and recover from emergencies and disasters caused by flood hazards.

- Complete installation of warning sirens to inform the public of imminent flood potential.
- Conduct public education program to inform residents of appropriate measures to take when an alarm is sounded and document flood evacuation procedures in Emergency Operations Plan.
- Continue to provide community emergency preparedness training through the CERT and Get Ready programs.
- Continue the Citizen's Voluntary Creek Monitoring Group that formed after the 12/31/05 flood; support and value this effort.

Objective 6: Continue to support watershed based planning efforts to further comprehensive flood mitigation planning and implementation of mitigation measures.

- Continue to participate in the Ross Valley Watershed Program and Flood Control District 9.
- Work cooperatively with upstream and downstream communities to monitor creek and watercourse flows to predict potential flooding.
- Work to solve ongoing localized flooding issues on private property, without taking on further liability risk for the Town.
- Encourage other special districts (e.g., Ross Valley Sanitary) to take responsibility and action for their infrastructure that may be contributing to flooding or fish passage barrier situations.

Section 1: Introduction

1.1 Purpose of the Plan

The Town of Fairfax Flood Mitigation Plan presents a comprehensive strategy to guide community efforts designed to reduce the damage, loss and disruption from future flood events. Hazard mitigation is defined as any sustained action taken to reduce or eliminate long term risk to human life and property. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition it can protect critical community facilities, reduce exposure to liability and minimize community disruption.

Following the December 31, 2005 floods that caused extensive damage to Town facilities, businesses, residences and other property, the Town applied for and received a grant from the Federal Emergency Management Agency (FEMA) to develop a Flood Mitigation Plan. This plan has been prepared in compliance with all federal grant and program requirements as outlined in 44 CFR Section 78.5 - Floodplain Management Plan development and includes the following minimum elements as specified:

- A description of the planning process and public involvement;
- A description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential;
- The Town of Fairfax floodplain management goals;
- Identification and evaluation of cost-effective and technically feasible mitigation actions considered;
- Presentation of the strategy for reducing flood risks and continued compliance with the National Flood Insurance Program;
- Procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan; and,
- Documentation of formal plan adoption by the Fairfax Town Council.

Adoption of this Flood Mitigation Plan by the Fairfax Town Council and approval by FEMA not only meets requirements of the Planning Grant, but also qualifies the Town of Fairfax to apply for and obtain future pre- and post-disaster flood mitigation grants.

The primary purpose of this plan is to identify community policies, actions and tools for implementation over the long-term, which will result in a reduction in risk and potential for future flood losses community-wide. This is accomplished by using a systematic process of learning about the flood hazard that can affect the Town of Fairfax, setting clear goals, identifying and implementing appropriate actions, and keeping the plan current.

An added benefit of the plan development process has been to identify and consolidate various data sources and activities currently underway. The Plan relies primarily on accessing existing, readily available information rather than endeavoring to undertake new scientific studies or modeling efforts.

This Plan is consistent with and supports the objectives of other existing or on-going planning efforts including the Update of the General Plan, Environmental Safety Element, the Local Hazard Mitigation Plan, the Community Rating System, the Emergency Operations Plan.

1.2 Community Profile

Physical Setting

The Town of Fairfax, one of eleven incorporated cities, is centrally located in Marin County, California, which is a northern county in the San Francisco Bay Area. The Town covers 2.2 square miles of land area and is bordered by the Town of San Anselmo to the east, and on all other sides by unincorporated county lands and preserved open space.

Situated in the Northern California Coastal Range, Fairfax enjoys a Mediterranean climate with mild year round temperatures. Most of the annual rainfall, which averages between thirty and fifty inches per year, occurs during the winter months from November to April. Periods of concentrated heavy rainfall have caused extensive flooding and landslides in the past, but the area is also susceptible to extended periods of drought when less than average rainfall occurs in consecutive years.

The natural beauty of the area creeks, canyons, steep hillsides and meadows make Fairfax an attractive place to live. Proximity to the metropolitan centers of the Bay Area and major recreational destinations such as the Point Reyes National Seashore, contribute to its desirability as a place to settle.

History and Development

The coast and inland valleys of Marin County were home to Miwok Indians for centuries before the arrival of the Spanish into California. The area that is now Fairfax was originally part of the Mexican Land Grant called Canada de Herrera which was first deeded in 1839. The Town gets its name from Lord Charles Snowden Fairfax who arrived in the area from Virginia in the mid-1850's. Ranching, lumber, and country resort recreation were the primary activities until after the turn of the century, when three tracts of land were subdivided: the Fairfax Tract, Ridgeway and Deer Park. Still lightly populated, the area was an attractive setting for Western movies up until around the early 1920's, and also the site of a tuberculosis sanatorium, whose patients produced the locally renowned "Arequipa" pottery.

The Town built up around the Fairfax Tract and the creek. Nine of the sixty-five acre Tract were acquired by the Fairfax Volunteer Firemen in 1920 to be preserved as a Town Park. Although the Park has grown smaller over the years, several important Town buildings still occupy the site, including Town Hall, the Police and Fire Stations, the Pavilion, and the Women's Club. The Town was incorporated in 1931.

Most early residential development occurring between 1907 and 1914 was concentrated on the valley floor. Early and subsequent commercial development has also been limited to the valley floor areas. Residential communities now extend out and up into the steep canyons and hillsides which surround the valley on both the north and south sides.

Over the years, through zoning and land use regulations, development in the Town has preserved important physical features such as ridgelines, hillsides, and natural areas. The Town of Fairfax is, for the most part, built out, with few undeveloped parcels remaining for residential or commercial uses. Any new development will not occur as a result of subdivisions of land, but rather as infilling within undeveloped or underdeveloped sites, or by refilling lots by replacement of one structure with another, potentially larger structure. When constructed to current building codes and in keeping with the Floodplain Management Ordinance, new and renewed construction is not expected to increase the Town's vulnerability to flooding.

Based on projections developed by the Association of Bay Area Governments (ABAG), Fairfax is expected to experience slight growth in the next 10-15 years, with the job market also increasing slightly. By 2020, Fairfax, as determined by ABAG projections, is expected to gain approximately 1100 new residents, 320 new households, and about 190 new jobs. Fairfax is expected to realize a growth rate of about 3.6%.

Demographics/Economics

The Town has a resident population of approximately 7500. The estimated median household income in 2005 was \$64,700, higher than the median household income for California which was \$53,629, but substantially lower than the rest of Marin County. It is estimated that over 52% of Fairfax households fall in the low and very low income categories.

There are 3,264 parcels in Fairfax. Residential parcels are the predominant use, with 3,017 residential parcels providing 3,479 living units. The remaining parcels are split between commercial use, which accounts for 127 parcels, and 120 parcels designated for other uses.

The total assessed value of land and improvements in Fairfax approach the \$1 billion mark. The estimated median house/condo value in 2005 was \$705,700, higher than the median value for California which was \$477,700. Property values remain fairly stable in the area despite the recent housing market declines in the State and elsewhere in the country. Approximately 62% of homes are owner occupied, and the average family household size in Fairfax in 2005 was 2.33.

Institutional Framework

Fairfax is governed by a five member elected Town Council. The Town Manager is the administrative head of the Town organization, and provides coordination of all Town departments through four Department Directors: Police Chief, Public Works Director, Planning and Building Director, and Finance Director. The Town currently has twenty-nine budgeted full time positions. In comparison to other small Marin County communities, Fairfax has one of the lowest employee-population ratios, with nearly 250 residents per employee.

The work of the Town Council, Department Directors and staff is supported by a number of Boards and Commissions which are staffed by volunteers, including the following: Design Review Board, Planning Commission, General Plan Advisory Committee, Parks and Recreation, Volunteer Board, Tree Committee, Open Space Committee, Artist in Residence, Measure F and K Oversight Committees, and Citizens' Disaster Council.

The Town's budgeting structure consists of the general fund, capital projects funds, reserve fund, and other funds which are restricted by law. The general fund is the major fund of the Town and is considered the operating fund. Personnel costs account for approximately 80% of the general fund budget in any given year. In addition to property tax revenues and other taxes levied and collected by the State, the general fund is supplemented by local voter-approved assessments including the following: general purpose per unit tax, pension tax, storm water runoff fee, special municipal per unit tax, bond assessment for capital projects, and a utility user tax. The retail base which generates sales tax is rather limited, with sales tax providing only about seven percent of the general fund budget.

Infrastructure

Roads & Highways:

There are no major highways located in Fairfax. Travel into and out of the area to adjoining towns and the greater metropolitan areas to the east and south, as well as to recreational destinations to the west and north is accomplished through two lane roads. The main travel artery that runs through the valley is Sir Francis Drake Boulevard. There are a total of 33.9 road miles in Fairfax. Many of the canyon roads are winding and narrow, which creates challenges for residents and emergency services personnel during winter storms.

In the late 1800's the area was served by a railroad that allowed residents to travel to and from the San Francisco area. The former railroad line is now Center Boulevard and several of the intersections are former railroad stops.

Utilities:

Drinking water is provided through the Marin Municipal Water District (MMWD), a public agency which serves ten communities and the unincorporated areas of central and south Marin County. MMWD is responsible for all aspects of water collection, treatment, storage and distribution systems.

Established May 27, 1899, Ross Valley Sanitary District is the oldest sanitary district in Marin County and may be the oldest sanitary district in California. Its boundaries include 26.75 square miles of the Ross Valley watershed, including the Town of Fairfax. The District operates and maintains approximately 180 miles of collection sewer lines and 20 pumping stations which collect, pump, and transport approximately 3 million gallons of sewage per day to Central Marin Sanitation Agency (CMSA)¹ for treatment. Approximately 95% of the District's collection system was installed prior to 1955.

Marin Sanitary Service offers residential waste collection and recycling services to Fairfax customers as well as other Marin County communities and portions of the unincorporated County.

Electricity and natural gas are provided to Fairfax residents and businesses by the Pacific Gas and Electric Company, which serves approximately fifteen million people throughout a 70,000 square mile service area in northern and central California.

Section 2: Planning Process

2.1 Plan Development

The Town of Fairfax Flood Mitigation Plan is the culmination of several planning efforts initiated to address the flood hazard in the Town of Fairfax: the Ross Valley Watershed Flood Protection and Creek Restoration Program (RVWP), the Local Hazard Mitigation Plan (LHMP), and the Update of the General Plan Environmental Safety Element (ESE). This section describes each of those planning efforts and how they have contributed to the development of this Flood Mitigation Plan, and documents the planning process carried out under this Flood Mitigation Assistance Grant.

The Ross Valley Watershed Flood Protection and Creek Restoration Program (RVWP)¹

This program was initiated in January 2006, in response to the December 31, 2005 floods that impacted many Marin County communities, to create a comprehensive strategy for the entire Ross Valley Watershed. Led by the County of Marin Department of Public Works, the Program is a collaborative effort that includes the City of Larkspur and Towns of Fairfax, Ross and San Anselmo. The County of Marin Flood Control District, Zone 9 Advisory Board provided valuable insight to program budgeting and planning. The Program also included participation by a wide range of partners, technical and financial working groups, and community members. The Financial Working Group, composed of County representatives and City managers, analyzed funding mechanisms. Members of the Technical Working Group included expert technical consultants of civil and hydraulic engineers, geomorphologists, hydrologists, riparian ecologists and fish biologists from the County, Friends of Corte Madera Creek Watershed, the Army Corps of Engineers, and outside consultants, as well as community volunteers. They performed detailed forensic analysis of the flooding, including watershed-wide hydraulic mapping. Working with the cities, the technical working group developed strategies for the most effective flood protection solutions that also respect the creek and enhance the environment.

Three community meetings were held during the program development phase of the RVWP. The first meeting held on May 20, 2006, introduced the planning process, provided a technical analysis of the flooding that occurred on December 31, 2005, and presented the solutions framework that would guide future efforts. The second meeting held on October 20, 2006, presented preliminary solutions and a proposed financial plan to fund implementation. The third and final community meeting held on February 10, 2007, presented agreed upon solutions, an integrated finance plan and information about a potential property owner assessment. All three meetings were designed to be interactive and ample time was provided for community questions, answers and other input. Results of the RVWP are documented in Section 3 of this Plan.

¹ Also referred to as the Ross Valley Watershed Program throughout this document.

Town of Fairfax Local Hazard Mitigation Plan (LHMP) Annex

The Town of Fairfax Local Hazard Mitigation Plan Annex was adopted by the Town Council on June 1, 2005 and approved by the Federal Emergency Management Agency on September 26, 2005. The Plan Annex was developed as part of the regional planning effort coordinated by the Association of Bay Area Governments (ABAG) that resulted in a Multi-jurisdictional Hazard Mitigation Plan for the San Francisco Bay Area. The Town of Fairfax participated in that effort, and produced a Local Annex to that Plan which meets all planning process requirements under the Disaster Mitigation Act of 2000. As part of that process, key Town staff prioritized mitigation actions to be included in the Town Annex from a list of several hundred mitigation strategies developed as part of the regional plan development process. The Town assessed each of the strategies for appropriateness to their community and established a list of very high, high, and moderate priority actions to be pursued. The LHMP Annex also stipulated that the mitigation strategies identified in the Annex were to become an Implementation Appendix to the Town's Environmental Safety Element of the General Plan, and that those mitigation strategies would be evaluated by the General Plan Advisory Committee during the update of the General Plan Environmental Safety Element.

General Plan Environmental Safety Element Update (ESE)

The Town of Fairfax is in the process of updating its General Plan, including various Elements required by California law. One required Element is the Safety Element, which is called the Environmental Safety Element (ESE) in the Town's General Plan. The Environmental Safety Element includes information on natural hazards that can impact the Town, including earthquake, landslide, fire and flood. The General Plan Advisory Committee (GPAC) serves as the citizen advisory committee for the update of the General Plan and its required Elements. As a result of the December 31, 2005 flooding and the subsequent receipt of the Flood Mitigation Planning Grant, the GPAC focused its attention on the flood portion of the ESE Update. The GPAC discussed the flood hazard and causes of flooding, discussed and evaluated the mitigation strategies included in the Fairfax LHMP Annex, and provided review and comment on draft mitigation policies and implementation plans. The GPAC met monthly throughout this planning process.

Flood Mitigation Assistance Planning Grant (FMAP)

Recognizing the significant flood risk to the Town which was underscored by the December 31, 2005 floods, the Town applied for and received a Flood Mitigation Planning Grant from the Federal Emergency Management Agency in August 2006. Following standard contracting procedures, the Town issued a Request for Proposals in October 2006 and awarded the contract to Natural Hazards Mitigation early in 2007, with a formal contracting Letter of Agreement executed in June 2007. This timing was designed to allow the discussions, deliberations, findings and recommendations of the Ross Valley Watershed Program and the General Plan Advisory Committee to take place without duplication of effort and unnecessary grant expenditures. Although not directly funded by the FMAP Grant, the RVWP and GPAC planning efforts provide a foundation

and must be considered a critical part of the planning process that resulted in this Flood Mitigation Plan.

The Town Manager took the lead responsibility for plan development and outreach and was the primary day to day contact for the planning effort. Town Department Directors served as the Technical Oversight Committee which met at critical points during the planning process to provide input and information sources to the consultant and to review draft documents. Additionally, the Town of Fairfax Disaster Council was appointed as the citizen's advisory committee and to ensure that a broad base of interests and cross-jurisdictional issues were addressed. The Disaster Council began the FMAP planning process at its June 21, 2007 meeting and continued to meet approximately every six weeks until conclusion of the plan development and review process. A roster of Disaster Council members is included in the Appendix.

2.2 Public Outreach

The Town of Fairfax is committed to an open and participatory process in all aspects of planning and development that impact the Town and the citizens it serves. Several methods of communication were used to keep the community informed of the plan development process, community workshops and the plan review process. These include:

1. The Town of Fairfax website, where key events were posted on the home page as well as the Town Calendar;
2. The Town Manager Blogspot, where workshop agendas, results, and other documents were posted;
3. Media announcements of upcoming events and notices and articles of interest in the Marin Independent Journal, the Ross Valley Reporter, and the Friends of Corte Madera Creek Newsletter;
4. E-mailings to extensive mailing lists maintained by the Town Manager and the Fairfax Volunteers;
5. Agendas and minutes of the Disaster Council Meetings posted on the website; and,
6. Agendas and minutes of the General Plan Advisory Committee Meetings posted on the website.

Two Community Workshops were held during the plan development process, one at the outset of the FMAP development process, and the second to solicit input on mitigation strategies. The first community workshop was held on July 26, 2007. The purpose of the workshop was to introduce the community to the flood mitigation planning process, to gather data on flood impacts, and to solicit community input on potential solutions to reduce future flood damage. A Community Flood Damage and Action Survey was distributed at the workshop to collect information directly from participants regarding their past flood experiences, mitigation actions and future priorities. The survey was also made available through the Town website so that individuals who could not attend the workshop were provided the opportunity to participate. The second workshop was held

on November 29, 2007 to provide an update to the community on the planning process, present results of the Community Flood Damage and Action Survey, provide preliminary recommendations for mitigation strategies, and to solicit additional input. Copies of workshop announcements, and survey and results are included in the Appendix to this Plan.

During the course of this planning process, the Town of Fairfax held additional community workshops that focused on flood and creek protection issues. On November 10, 2007, a workshop was held to present the results of a study conducted for the Town by Fluvial Geomorphology Consulting to assess biotechnical bank stabilization and riparian and aquatic habitat protection and enhancement as part of the repair of sites damaged in the December 31, 2005 floods. In response to the participants' interest in learning about how to control stream bank erosion and improve fish passage opportunities in the creek, a second workshop was organized by the Friends of the Corte Madera Creek Watershed. The workshop, held on March 1, 2008, included a presentation by the Urban Creeks Council on soil bioengineering and natural solutions to erosion control by biotechnical solutions.

Table 2-1 provides a summary of planning and outreach activities.

2.2 Plan Review and Adoption

Plan review was incorporated into every step of the planning process through Disaster Council Meetings and periodic review of draft sections of the Plan. Following completion of the Administrative Draft, internal review was conducted by the Disaster Council and Town Department Directors. Subsequently, a Public Review Draft was posted for a thirty day public review period, consistent with standard Town plan review procedures. Copies of the Public Review Draft were made available to the public at various Town locations, including Town Hall and the Library. Additionally, the Public Review Draft was posted on the Town web site. Public notices were published in the Marin Independent Journal and the Ross Valley Reporter.

To ensure maximum opportunity for public input, three Public Hearings were held in conjunction with Town Council Meetings on May 21, June 4, and June 18, 2000. All public input comments were reviewed and revisions to the Plan were made as appropriate. Immediately following the third Public Hearing, the Town Council adopted the Flood Mitigation Plan. A copy of the signed resolution appears at the outset of this Plan.

Table 2-1 Summary of Planning & Outreach Activities

Date	Group	Items Discussed
5/20/06	RVWP	Technical analysis of flooding; Solutions framework
10/20/06	RVWP	Preliminary flood solutions; Proposed financial plan
11/30/06	GPAC	General hazard and risks impacting the community
1/25/07	GPAC	Overview of existing Local Hazard Mitigation Plan
2/10/07	RVWP	Recommended priority projects; Property tax assessment
2/22/07	Oversight Team	Introduction to FMAP process; Existing data sources; Priority issues for Town
2/22/07	GPAC	Existing hazard maps and limitations; Identified main causes of flooding
3/22/07	GPAC	Need for better data and documentation of flood history and damage; Flood risk and potential strategies
5/24/07	GPAC	Flood risk to infrastructure; Drainage issues and solutions; Other input from Public Works Director
6/12/07	Disaster Council	Overview of planning process; Role of the Disaster Council; Flood risk and current activities
6/28/07	GPAC	Planning for Community Workshop #1
7/26/07	Community Workshop #1	Overview of planning process for FMA; Community Input on Flood Issues; Community Flood Damage and Action Survey
8/28/07	Disaster Council	Community Workshop #1 Summary; Input on mitigation strategies
10/4/07	Disaster Council	Community Workshop Survey Results; CRS Quick Check Results; Draft Goals/Objectives/Actions
10/25/07	GPAC	Community Workshop & Survey Results; Present first draft of ESE flood policies/actions; Acceptable level of risk
11/10/07	Community Presentation	Summary of Bank Stabilization Recommendations by FGC
11/28/07	GPAC	Review and input to first draft of ESE flood policies/actions
11/29/07	Community Workshop #2	Update on Planning Process; Results of Community Survey; Discussion of mitigation actions & strategies
12/7/07	Disaster Council	Community Workshop #2 Summary Prioritization of mitigation strategies
12/13/07	Oversight Team	Review Priority Flood Mitigation Actions & Implementation Strategies
12/13/07	GPAC	Review revised draft of ESE flood policies/actions
1/25/08	Disaster Council	Review Priority Flood Mitigation Actions & Implementation Strategies
3/1/08	Community Presentation	Urban Creeks Council Presentation on creek bank restoration for private property owners
3/14/08	Disaster Council	Review draft Flood Mitigation Plan
4/18/08	Disaster Council	Plan revisions and schedule for Public Review
5/21/08	Public Hearing #1	Public Hearing and community comments at Town Council Meeting
6/4/08	Public Hearing #2	Second Public Hearing and community comments at Town Council Meeting
6/6/08	Disaster Council	Discussion of Public Review Comments and plan revisions
6/18/08	Public Hearing #3	Final Public Hearing and Plan Adoption by Town Council

Section 3: Flood Risk Assessment

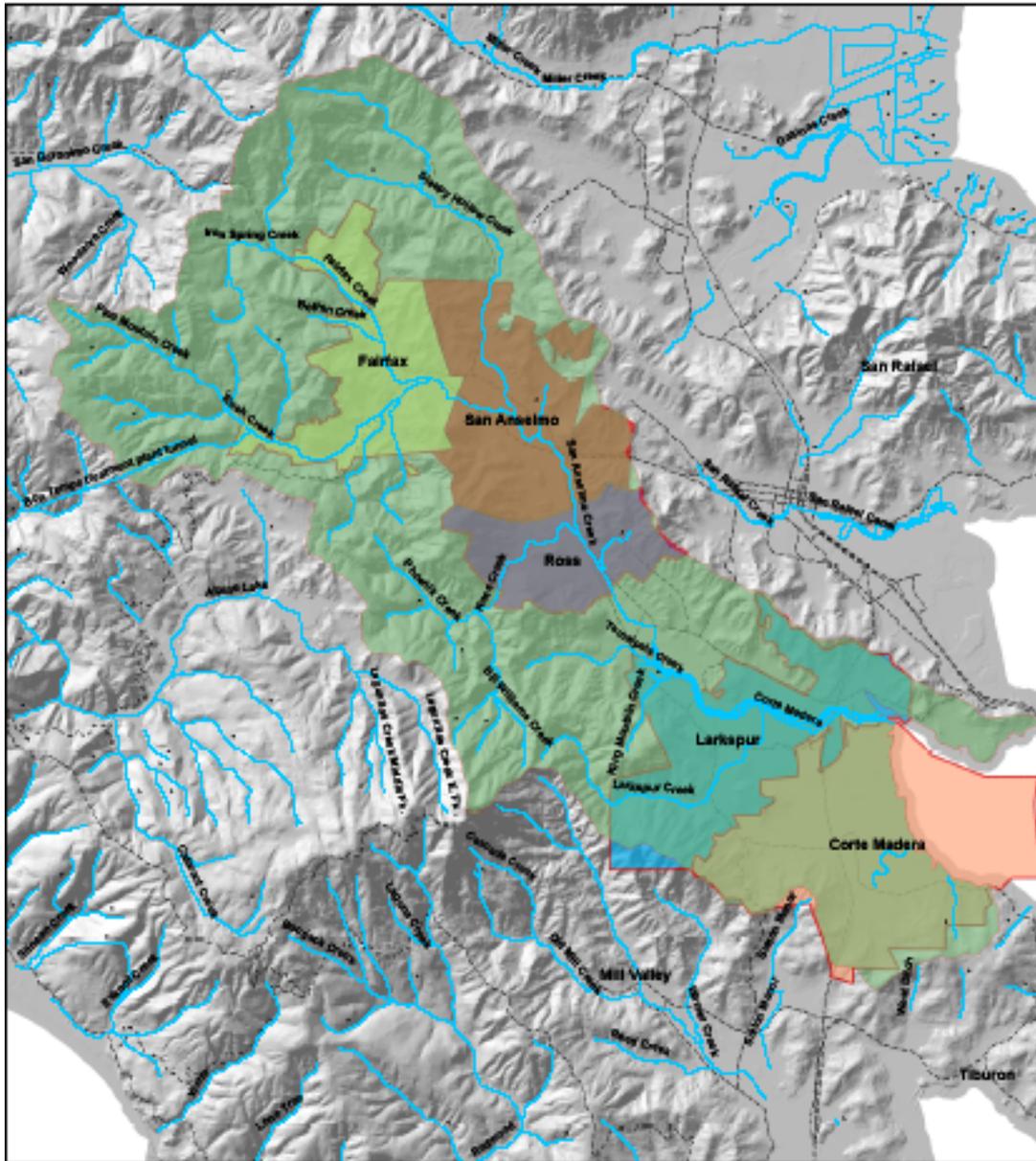
3.1 Description of the Flood Hazard

The Ross Valley Watershed reaches from the foothills of Mount Tamalpais in the Coast Range to the San Francisco Bay. It is bounded on the west by a steep, forested ridge running northwest from the East Peak of Mt. Tamalpais to Pine Mountain and then north-northeast to White Hill and Loma Alta. The hills separating San Rafael from the Ross Valley form the northeastern boundaries of the watershed. The watershed drains approximately thirty square miles into nearly as many named creeks. San Anselmo and Fairfax creeks rise along the southern and western ridges and drain steep upland areas onto relatively steep and narrow valley flats. These creeks combine as San Anselmo Creek in the Town of Fairfax. San Anselmo Creek then flows southeast through Ross Valley, bounded by a sandstone ridge running southeast. Several intermittent tributaries rise on the grassland and grass-oak woodland-covered hills along the northern and eastern edges of the basin. See Figure 3-1.

It is important to note at the outset that Ross Valley is naturally prone to flooding by its location and geologic and fluvial geomorphic setting. Rainfall can be extremely intense, soils are shallow with limited absorbing capacity, slopes are steep, and the stream channels are incised and narrow offering little in-channel storage. Development in the Ross Valley has created expansive impermeable areas while encroaching onto the banks of the channel, supplanting the natural flood-attenuating capacity of the floodplain. The effects of narrow bridge and culvert openings and poorly designed residential streambank stabilization structures have been superimposed on this naturally flood-prone system, exacerbating the flooding problem. Although the frequency and extent of flooding can be significantly reduced by replacing constricting structures, widening the creek where possible, and building storage, the threat of flooding by very large floods will always remain.

Downtown Fairfax begins to flood when the capacity of the long culvert at the downstream end of Fairfax Creek is exceeded or debris blocks its entrance. Water leaving the creek upstream of the culvert runs through downtown Fairfax and returns to the main channel downstream of Pacheco Avenue, where the channel is deeply incised and is able to convey greater flows. Flood flows are contained in the naturally larger channel until reaching the next downstream constriction at Saunders Avenue in San Anselmo. *(Source: A Framework for Developing Effective Management Solutions to Flooding in the Ross Valley Using Hydraulic Modeling)*

TOWN OF FAIRFAX ROSS VALLEY WATERSHED



■ ROSS VALLEY WATERSHED

City Name

- Corte Madera
- Fairfax
- Larkspur
- Ross
- San Anselmo

Base Map

- Creek
- - - Major Roads

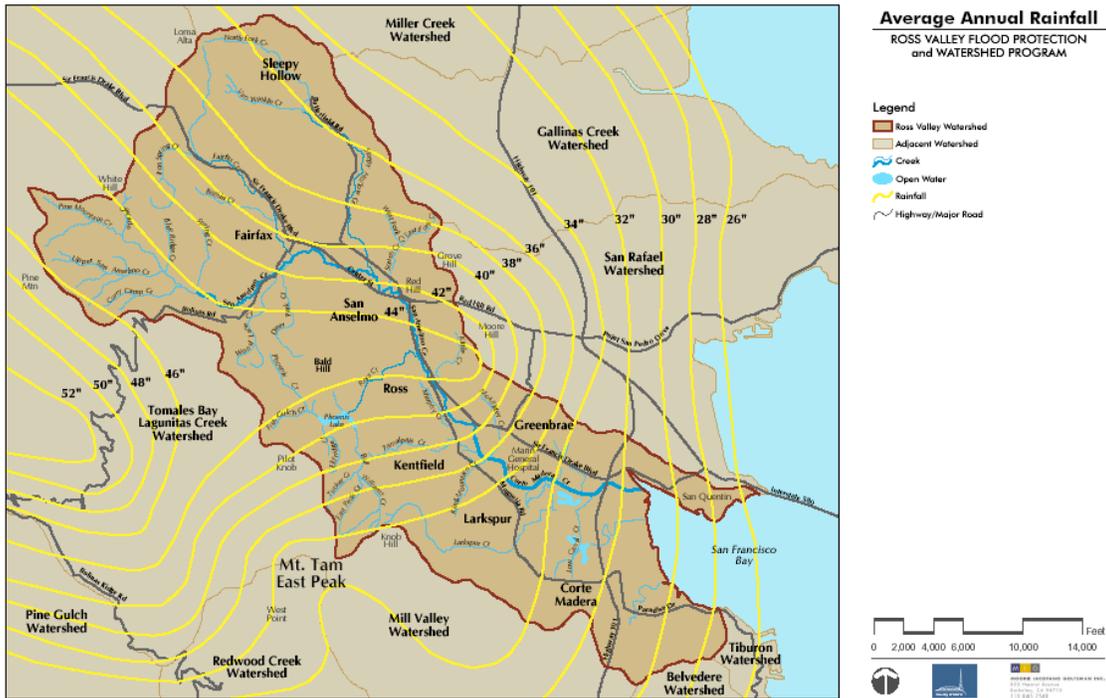


SOURCE: Marin County Marin Map GIS Data - 2007

FIGURE 3-1

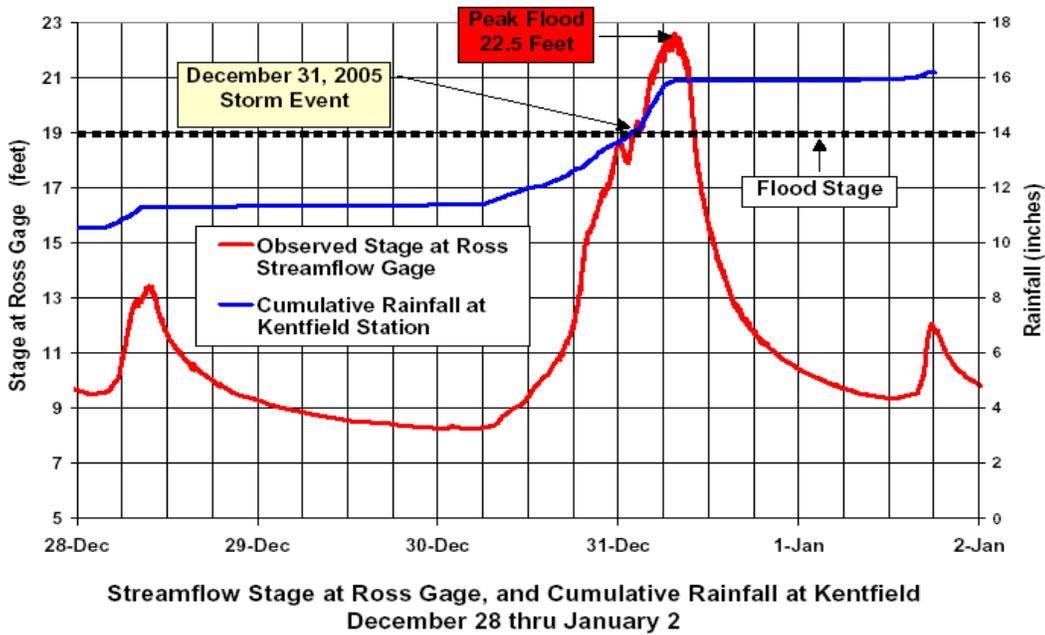
Rainfall in the Marin County Coastal Range area averages from thirty to sixty inches per year, most of which falls during the winter months between November and April. The figure below, developed for the Ross Valley Flood Protection and Watershed Program, indicates the Fairfax area receives between thirty-eight and forty-four inches annually.

Figure 3-2 Average Annual Rainfall (Source: Ross Valley Watershed Program)



Records kept by Crocker Citizens National Bank and its predecessors, Bank of Marin and First National Bank of San Rafael, run back to 1875-76. Over a period of about a century, the greatest rainfall was produced during the rainy seasons of 1889-90, 1913-14, 1914-15, 1940-41, 1957-58, and 1966-67. However, in 1969, rainfall totals by the end of February had exceeded any year on record to that time. The 24-hour rainfall total in Fairfax on February 15 that year was recorded at 2.74 inches. In April of 1982, the City of San Rafael in south-central Marin County had passed the sixty-inch rainfall mark for only the sixth time in recorded history. Rainfall totals for the December 31, 2005 storms are shown in Figure 3.3 below, which clearly demonstrates the relationship between periods of intensive rainfall and the rapid rise of creek levels to flood stage. Seven inches of rain fell in the Ross Valley Watershed in the two weeks prior to the December 31, 2005 flood.

Figure 3-3 Rainfall and Creek Level Rise (Source: Ross Valley Watershed Program)



Several hydrologic and historical descriptions of the flood hazard in Fairfax provide useful information in defining the flood hazard. The hydraulic study prepared by Wallace, McHarg, Roberts and Todd (WMRT) laid the foundation for the Town’s first Environmental Safety Element adopted in 1976. It concluded that the primary flood prone areas within Fairfax are limited to the floodplain adjacent to the confluence of San Anselmo and Fairfax Creeks, which has a one percent chance, on average, of being inundated in any given year. The first Flood Insurance Study (FIS) for the Town of Fairfax, issued by the Federal Insurance Administration in March 1977, confirmed and expanded the flood hazard area to include San Anselmo Creek and its tributaries, Deer Park Creek and Wood Lane Drainage, as well as Fairfax Creek and its tributary, Bothin Creek. Stream profiles were prepared, and hydrologic analyses were carried out to establish peak flow discharge-frequency relationships for each stream as shown in Table 3-1 below.

A Preliminary Draft of the *Revised Flood Insurance Study for Marin County, California and its Incorporated Cities* was released by the Federal Emergency Management Agency (FEMA) in September 2007. The main purpose of the updated FIS is to provide the information in a digital format and to convert existing FIS data from the National Geodetic Vertical Datum of 1929 (NGVD29) to the North American Vertical Datum of 1988 (NAVD88). There appear to be no significant differences in the data contained in the existing (1977) and the updated portion of the (2007) FIS documents that addresses flood risk for the Town of Fairfax. The FIS identifies the floodplain boundaries for the

subject creeks, which in turn establishes flood insurance requirements and guides local floodplain management policies and programs. According to the FIS:

“Along Fairfax Creek, the boundaries of the 1- and 0.2-percent annual chance of flooding have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at scales of 1:24,000 and 1:3,600 with a contour interval of 10 feet.

San Anselmo Creek produces no flooding in Fairfax; the flows considered in this study are contained within the channel.

In Deer Park Creek and Wood Lane Drainage, the flood (sheetflow) boundaries were delineated using information supplied by local residents, available topographic information, and field-surveyed data, including cross sections.

For Bothin Creek, the estimated boundary of the 1-percent annual chance flood was determined in this study by using estimates of 1-percent annual chance discharges, culvert computations, and available topographic data augmented where necessary with field-survey data. Information provided by local residents was also used. Bothin Creek overflow is initiated outside the corporate limits of Fairfax. Flow is diverted to Bothin Road, Rockridge Road, and finally Fairfax Creek. Field data obtained for flood boundary delineation indicated shallow flow.”

The peak flow discharge-frequency relationships shown in the table below are calculated based on three factors: observed peak flows (historic); mean annual precipitation; and drainage area/topography. The frequency is expressed as a probability of occurrence. For example, a flood with a projected peak discharge of 3500 cfs at the Mouth of Fairfax Creek has a 1 percent chance on average of occurring each year. A more commonly accepted way of describing that probability has been in terms of how often one would expect to experience that level of flood. In the case of the 1 percent probability, it translates to a 100 year flood. However, using this terminology has led to confusion and misinterpretation, in that the actual occurrence of flooding experienced in the past 100 years has in many cases exceeded the probable events. Therefore, in the updated FIS, FEMA now uses the more accurate designation of percentage rather than year for calculating probability of occurrence. The Flood Insurance Rate Maps (FIRMS) produced by FEMA for purposes of flood insurance, which in the past showed 100 year and 500 year floodplains, now show those areas in terms of the 1 percent and .02 percent floodplains. See Figure 3-4.

Table 3-1 Creek Drainage Areas (Source: FEMA 1977 FIS)

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharge (Cubic Feet per Second)			
		10 Percent (10 Year)	2 Percent (50 Year)	1 Percent (100 Year)	0.2 Percent (500 Year)
<i>Fairfax Creek</i>					
Confluence with San Anselmo Creek	4.10	850	1450	1720	2400
Mouth of Bothin Creek	3.40	690	1200	1450	2000
White Hall School (Near Corporate Limits)	1.80	450	770	960	1600
<i>San Anselmo Creek</i>					
Mouth of Fairfax Creek	9.00	1970	3100	3500	4500
Mouth of Deer Park Creek	4.96	1080	1780	2100	3000
Mouth of Wood Lane Drainage	4.19	930	1620	1900	2780
Cross Section P	3.70	800	1420	1590	2350
Corporate Limits	3.10	725	1300	1480	2100

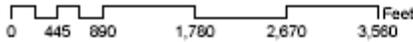
TOWN OF FAIRFAX FLOODPLAINS



Fairfax and Local Creeks

- 100 Year Floodplain
- 100 - 500 Year Floodplain
- Fairfax Town Boundary

SOURCE: Marin County Marin Map GIS Data - 2007



Base Map

- Creek
- Major Roads

FIGURE 3-4

Existing Flood Control Structures and Drainage Systems:

The 1977 FIS identifies two flood control structures in the Town of Fairfax and notes their inadequacies as follows: “There is a small dam on Fairfax Creek along Olema Drive (upstream from Westbrae Avenue) which acts as a drop structure. Fairfax Creek is diverted to San Anselmo Creek in a 10-foot by 6-foot conduit at Bolinas Avenue. None of these structures, however, provide significant protection from flooding in these areas.”

This information is consistent with information contained in the Storm Drain Study for the Fairfax Area that was prepared in 1966 for the City of Fairfax by the Marin County Flood Control District. That report reviewed several existing drainage structures on Fairfax and San Anselmo Creeks and made recommendations to 1) enlarge the undersized culvert on Fairfax Creek and under Sherman Avenue; 2) supplement the inadequate culvert facilities on Bothin and Deer Park Creeks, over which structures and roadways have been built, with pipe located in the road right of way; and, 3) institute a creek cleaning program for all major waterways in the Fairfax Watershed.

The Fairfax culvert was also studied in July 2002 as part of the Catalog of Marin County Stream Crossings, which stated for the culvert at Bolinas Avenue-Sherman Avenue: “A retrofit is probably not feasible because the box culvert is undersized and currently the inlet overtops on less than a 10-year storm flow.” A further study conducted in 2003 by Ross Taylor and Associates entitled “Marin County Fish Passage Evaluation” called out the culvert as a RED filter culvert, which means it does not meet the criteria for passage of all species and life stages of salmon as defined by the California Department of Fish and Game. The report also concluded that the culvert could not be retrofit to meet the fish passage criteria.

A hydraulic analysis conducted as part of the Ross Valley Flood Protection and Watershed Program by Stetson Engineers, and based on the December 31, 2005 flood flows, indicates that flood was a 100-year storm event, with a flow of 1700 cubic feet per second. The study also concluded that much of the Ross Valley storm drainage system currently provides only about 5-year flood protection, meaning that it can be overwhelmed by a storm that has a 20% chance of occurring in any year.

The hydraulic model simulated rainfall, how storm water flows through creeks, and where and how much water will break creek banks and flood. Although the hydraulic model did not include the portion of San Anselmo Creek and its tributaries that flow through the Town of Fairfax, those streams were modeled using existing information from the FIS cited above. The study resulted in a series of proposed flood protection solutions based on the following conclusions: 1) removing constrictions that block creeks could quadruple flood protection and contain floods during 20-25 year storms, and 2) adding detention basins upstream to hold water and release it slowly, could provide 100-year flood protection.

Ranking high on the priority list of infrastructure-related solutions is enlarging/replacing the Downtown Fairfax Culvert. This project, combined with construction of two detention basins upstream would provide 100-year flood protection to the Town of Fairfax. See Figures 3-5 through 3-8 below.

Figure 3-5 Fairfax Creek Simulated Flood Flow and Reported Damage Sites

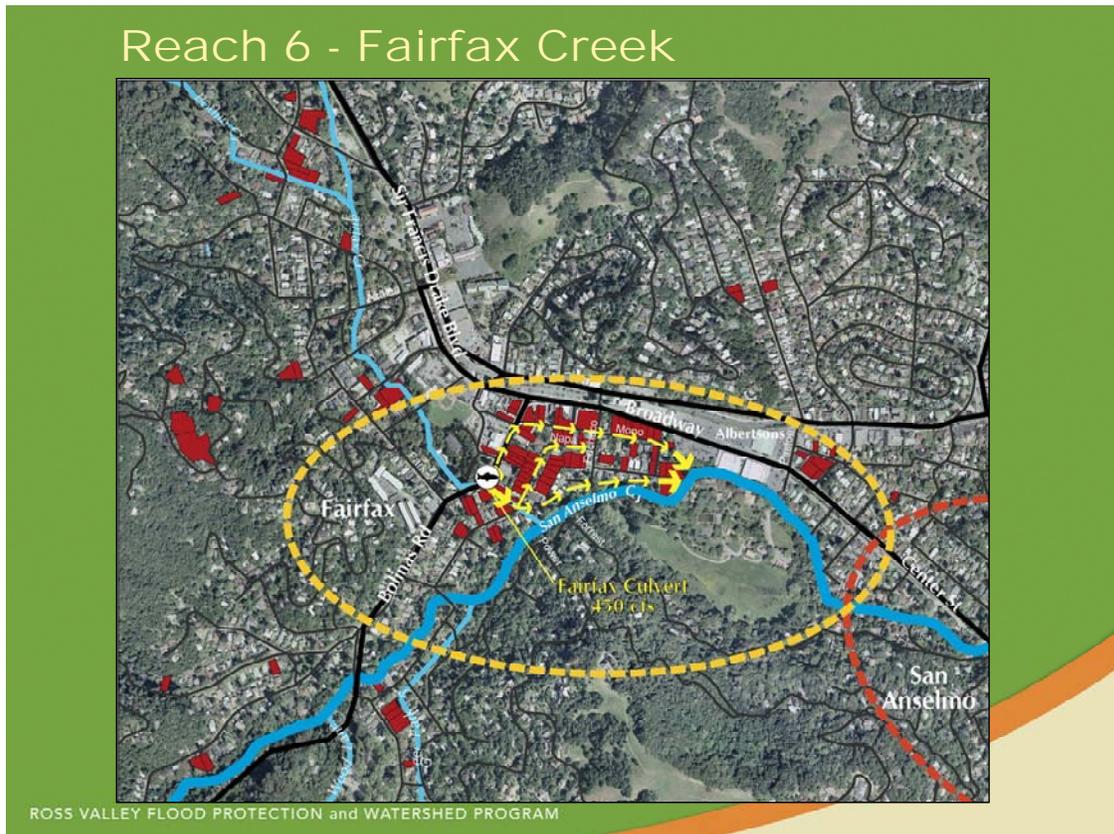


Figure 3-6 Fairfax Creek Culvert Under Sherman Avenue

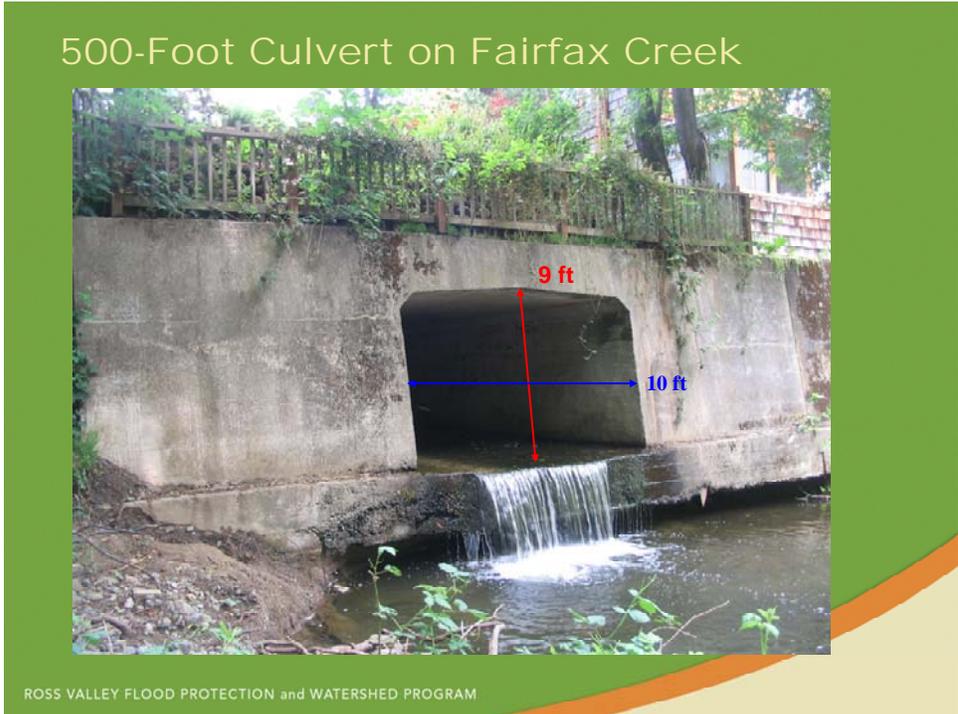


Figure 3-7 Fairfax Creek Hydraulic Model Results

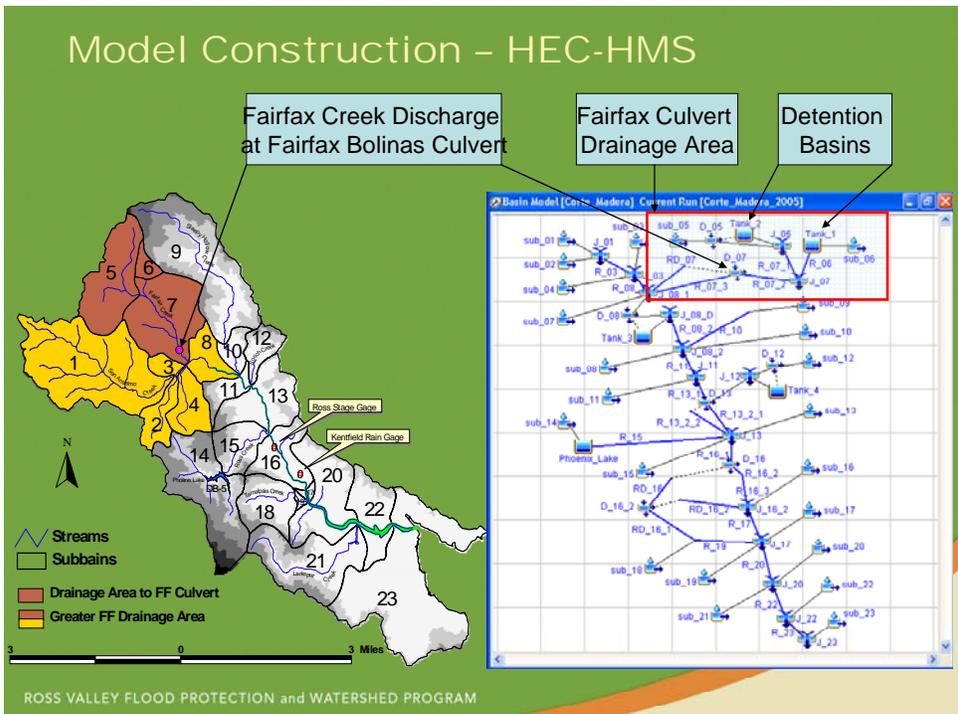
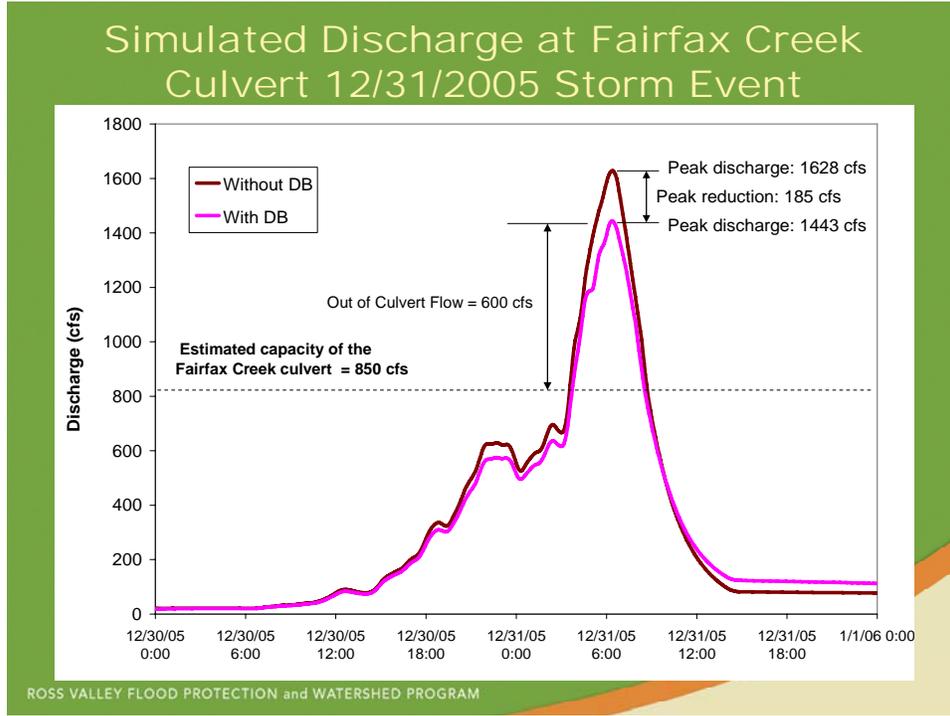


Figure 3-8 Simulated Peak Flow Reduction with Detention Basins



A recent and comprehensive analysis and documentation of drainage culverts and natural channels was conducted by Fluvial Geomorphology Consulting (FGC) in July 2006. The main purpose of the study was to evaluate the potential of biotechnical bank stabilization and riparian and aquatic habitat protection and enhancement as part of necessary repair work at six project sites that experienced damage due to flooding on December 31, 2005. However, as part of the study, FGC also conducted the following activities:

- field measured the high water marks to estimate flood depth at each site and approximate flood return intervals;
- identified potential flood flow conveyance constrictions at existing culverts and within natural channel sections; and,
- inventoried potential flood management improvement projects in Fairfax.

The resulting report, *Geomorphologic Assessment of Town of Fairfax Project Sites* identifies nearly 100 storm drains, their locations, design and structural condition, and provides preliminary recommendations for approximately 200 flood management improvement projects.

In reviewing the possible benefits of the recommended flood management improvement projects, it was determined that there was a symbiotic relationship between flood management and habitat restoration. Many proposed culvert improvements, streambank erosion control, and stream channel capacity solutions for flood management may also result in improvements to fish habitat and fish passage.

3.2 Flood History

Historic records of flood and resultant damage are scarce, however the 1977 FIS cites that major floods occurred in Marin County in 1952, 1955, 1958, 1967, 1969, 1970, 1973, and 1975, with the storm of December 1955 generally considered to be largest of this period. However, while most streams studied have short or nonexistent gage records, it is unlikely that any storm in this period produced peak stream discharges greater than a 20- to-25 year event on the basins studied. (FIS 2007). The 1977 FIS cites information supplied by local residents of flooding occurring in the lower reaches of Fairfax Creek, Deer Park Creek, Bothin Creek and Wood Lane Drainage during major storm events. The U.S. Army Corps of Engineers estimates that major damage occurred in Fairfax during the 1942 and 1955 floods.

Other reports indicate that the 1982 flood may have been the largest on record, but agree that the 1955 and 1964 floods may have equaled or exceeded the 1982 flood levels. Newspaper reports identify each of these events as 100 year floods, along with the most recent flood of December 31, 2005. Based on this minimal record, it appears that Fairfax experiences a 100 year flood every ten or twenty years.

Lack of stream gages and written historic records has resulted in many inconsistencies and potential inaccuracies in information describing the severity of past flooding events and specific local impacts. Table 3-2 below summarizes available information of past flood event loss estimates culled from Marin County and Town of Fairfax documents as well as newspaper articles.

Probability of Future Flood Events

Based on the information previously provided in this Section, it is reasonable to expect that the Town of Fairfax will continue to experience localized flooding during periods of extended heavy rainfall. It is highly likely that significant flooding, such as occurred on December 31, 2005, will occur again if the Town is unable to implement structural improvements to the stormwater drainage system or construct upstream retention basins as have been proposed in prior technical studies documented in this Plan. Based on the historical records, the Flood Insurance Rate Maps produced by the Federal Emergency Management Agency under the National Flood Insurance Program may underestimate the future potential for the 100 year/1% flood. It appears that events of this severity occur approximately every 20 years, increasing the annual probability to 5%. Adding to this concern is the lack of localized information on the potential impacts of climate change/climate variability on future weather patterns that will affect the Town of Fairfax. Scientific data indicates there is a trend toward more extreme weather events, including more intense storm events, which would undoubtedly increase the potential for flooding.

Table 3-2 Estimated Losses for Past Flood Events

Date	Damage Description	Loss Estimate
1/69	Marin County Wide: Public Property-Road Damage Private Property	\$ 411,000 \$ 400,000
1/82	Marin County Wide Total Damage County Roads and County Owned Property Staff Time and Emergency Repairs Town of Fairfax: Town Hall Private Sector (Homes/Apartments/Businesses)	\$150,000,000 \$ 25,000,000 \$ 750,000 \$ 30,000 \$ 1,800,000
2/86	Marin County Wide Total Damage Town of Fairfax: Road Repairs Clean-up Private Property-13 Homes Damaged	\$ 13,000,000 \$ 1,200,000 \$ 350,000 \$ 300,000 \$ 550,000
2/87	Marin County Wide Total Damage	\$ 12,153,200
12/31/05	Marin County Wide: Public Sector-Incorporated Areas & Special Districts Public Sector-Unincorporated Areas Private Sector-Incorporated Areas Private Sector-Unincorporated Areas Town of Fairfax: Town Facilities	\$ 15,291,500 \$ 16,355,000 \$ 54,595,380 \$ 8,595,000 \$ 1,400,000

3.3 Vulnerability Assessment and Loss Estimates

Critical to understanding the flood risk and determining cost effective risk reduction measures is identifying and quantifying community assets that are exposed to the flood hazard. This section examines the exposure of public and private sector assets, generally by identifying which of those assets are within the 100-year (1%) floodplain as defined by the FEMA Special Flood Hazard Areas (SFHA). Floods are often accompanied by landslide and debris flows, which can cause significant damage in areas that are located away from floodplains. While this hazard is related to flood risk, it is not directly addressed in this plan.

Town Owned/Critical Facilities

Several important Town buildings and facilities are located in the Special Flood Hazard Area (1%/100-year floodplain), including the Town Hall, Police Station, and Fire Station. These facilities have suffered damage in past flood events, including the December 31, 2005 flood which resulted not only in significant repair costs, but also extended dislocation and the need for temporary relocation facilities. Location of these critical facilities in relation to the Special Flood Hazard Area is shown in Figure 3-9 below.

Roads

Approximately five linear miles of roadways are within the SFHA.

Commercial and Residential Properties

Commercial and residential properties exposed to the flood hazard were identified by overlaying County Assessor parcel files and the Town zoning map with the Special Flood Hazard Area map, and using current assessed value as the total dollar exposure. However, it should be noted that assessed value does not reflect either current market value or current replacement cost of structures or content.

Based on the above methodology, there are 54 commercial parcels with an assessed value of more than \$20 million located in the SFHA, with approximately 78,000 square feet of commercial space.

Using the same methodology of overlaying the Zoning map with the SFHA map, there are approximately 375 single family residential parcels exposed to the flood hazard, with an additional 20 vacant parcels available for development. Using the current median home value of approximately \$700,000 for a single family residence, the total possible exposure, assuming total loss would be in excess of \$250 million. The methodology also identified 88 parcels zoned for multifamily residential, with 9 vacant parcels available for development.

Repetitive Loss Structures

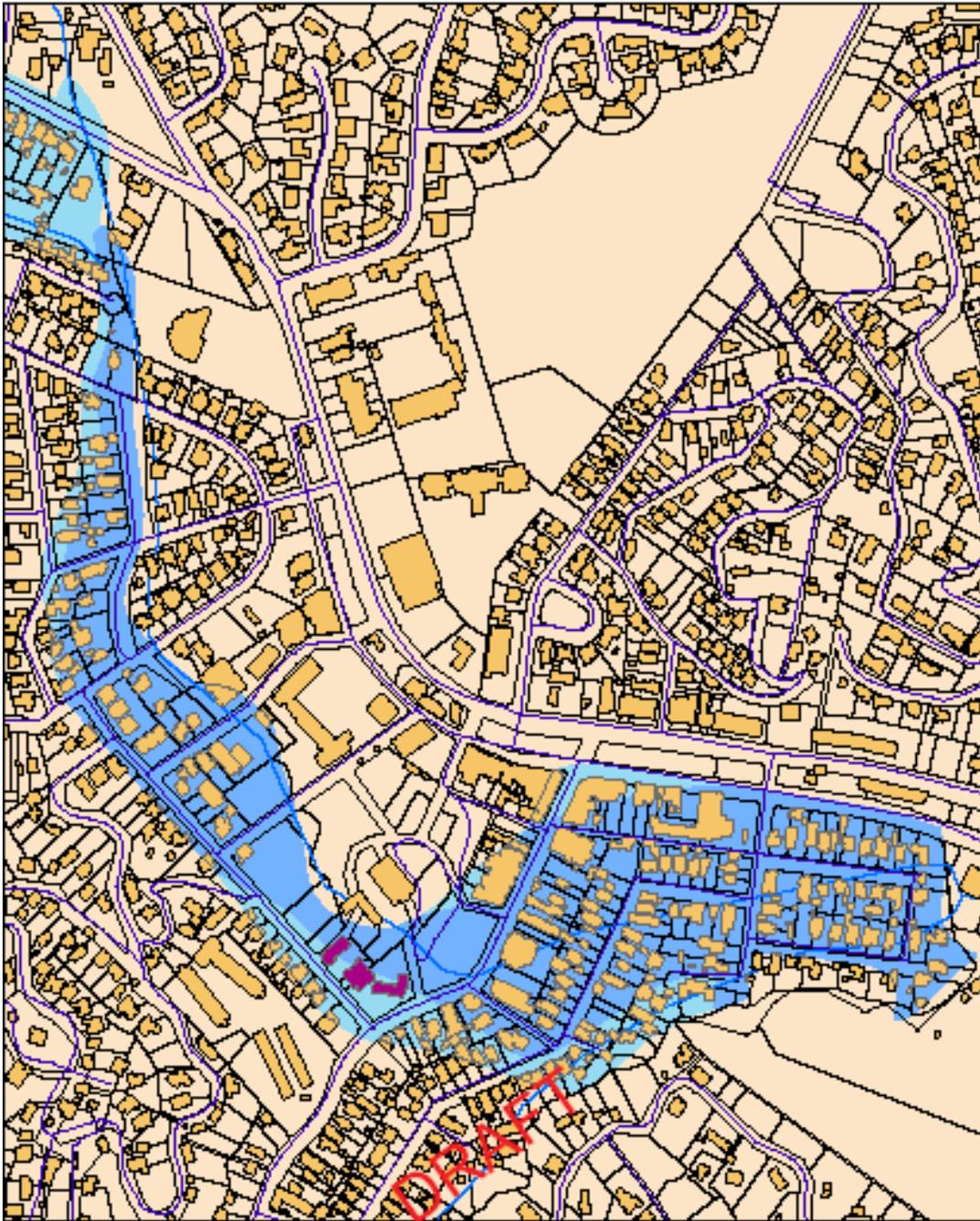
Repetitive Loss Structures as defined by the Federal Emergency Agency's National Flood Insurance Program (NFIP) are residential buildings that have experienced one or more of the following since 1978, regardless of any changes in ownership during that period:

- Four or more paid flood losses of more than \$1,000 each
- Two paid flood losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property
- Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property

Repetitive loss properties account for twenty-five to thirty percent of all claims paid by the NFIP, although they comprise only about one percent of insured properties. As of August 31, 2007, the Town of Fairfax has six FEMA-designated repetitive loss properties with an assessed value of \$1.2 million. (See Figure 3-10) At that time there were 107 properties insured under the NFIP in Fairfax, putting it slightly below the national repetitive loss average.

Total insured losses to those six properties totals nearly \$550,000. Left unmitigated either by individual action, such as home elevation, or through structural flood control measures, such as enlarging the Sherman Street culvert, these properties will likely incur a similar level of damage in future flood events.

TOWN OF FAIRFAX FAIRFAX CRITICAL FACILITIES



- 100 Year Floodplain
- 100 - 500 Year Floodplain
- Fairfax Critical Facilities

SOURCE: MARIN COUNTY MARIN MAP GIS - 2007

0 87.5 175 350 525 700 Feet

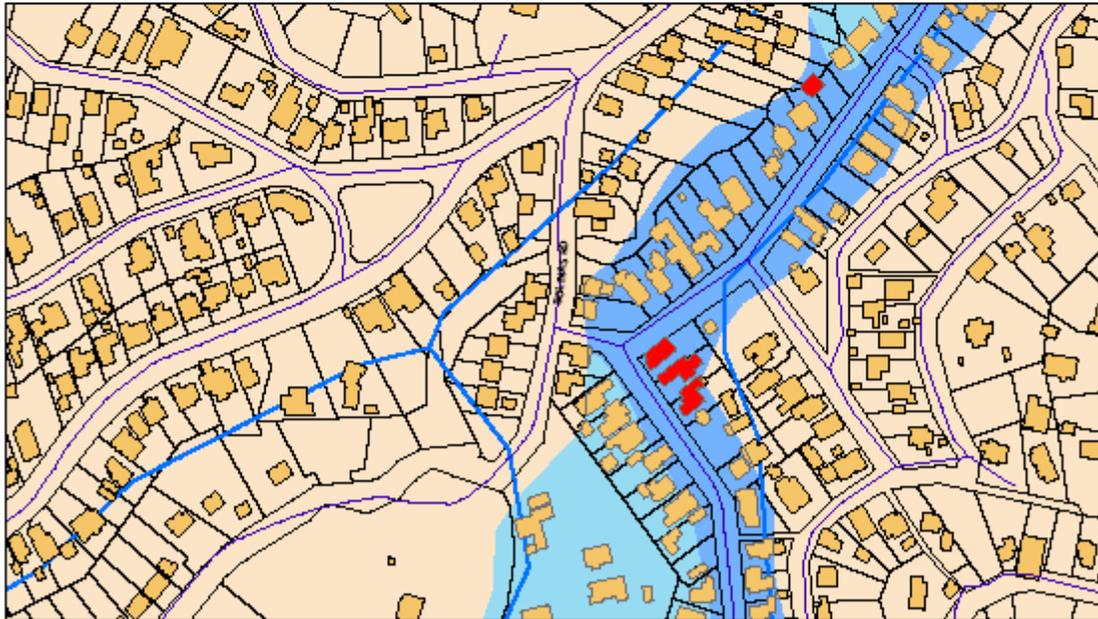
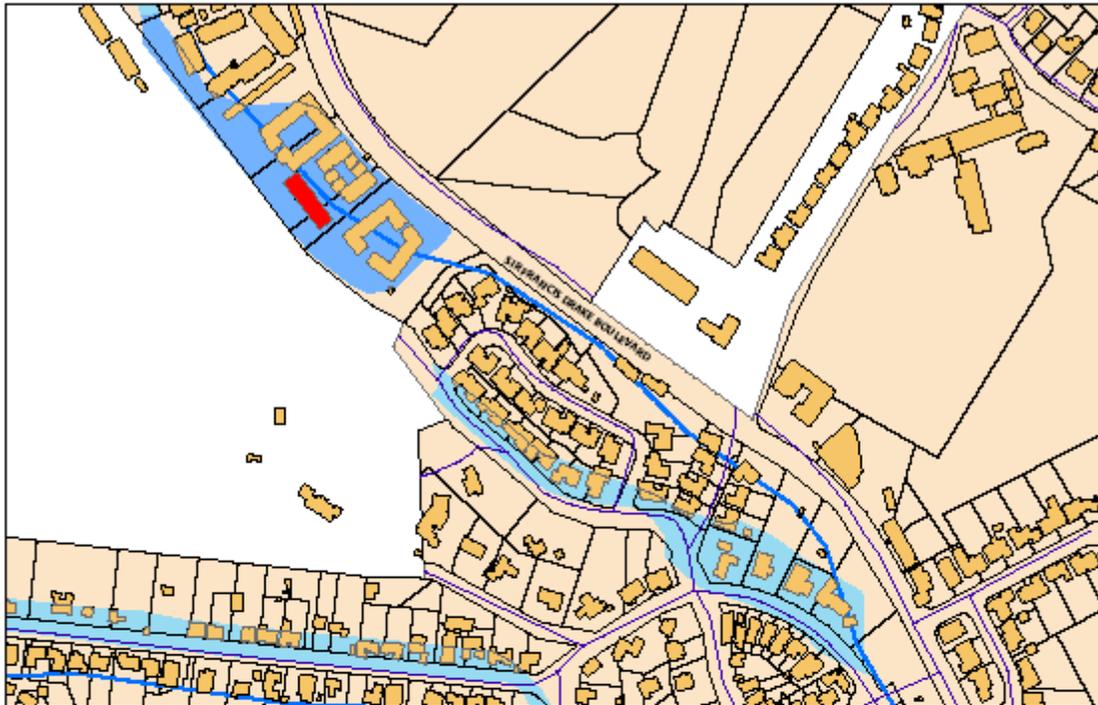


Base Map

- Major Roads
- Stream

FIGURE 3-9

TOWN OF FAIRFAX REPTITIVE LOSS PROPERTIES



- 100 Year Floodplain
- 100 - 500 Year Floodplain
- Repetitive Loss Properties

0 87.5 175 350 525 700 Feet



Base Map

- Creek
- Major Roads

SOURCE: MARIN COUNTY MARIN MAP GIS - 2007

FIGURE 3-10

Section 4: Capability Assessment

The Town of Fairfax can use a variety of different tools, assets, and authorities to effectively reduce or mitigate the impacts of floods in the community. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches. Examples of mitigation activities include educating citizens, enforcing building and development codes, carrying out capital improvement projects, adopting plans setting forth goals, policies and actions, establishing incentive programs and, in some cases, improving emergency response and preparation.

The capabilities available to the Town of Fairfax fall into the following broad categories: Agencies and People, Plans, Codes and Regulations, Programs and Mitigation Activities, and Financial Resources. This capability assessment reviews how the Town uses each of the capabilities available to mitigate its flood risk.

4.1 Agencies and People

Programs and policies are only meaningful if they are supported, enacted and enforced by motivated people with the time and resources to make them work. The Town of Fairfax has a number of departments, commissions, and councils that focus on disaster related issues, and it also benefits from the work of various state, federal, and non-governmental agencies. The most important players in the Town’s mitigation activities are described below.

Town Departments, Boards and Commissions

The key Town Departments involved in flood mitigation and their role in managing disasters are presented in Table 4-1.

Table 4-1 Town Departments, Boards and Commissions

Department	Role in Disaster Mitigation and Management
Ross Valley Fire Department (JPA between Towns of Fairfax and San Anselmo)	<ul style="list-style-type: none"> • Provides fire protection and emergency medical services within Fairfax-San Anselmo areas. • Maintains Fairfax Creek Depth Monitoring Device & electronic data collection/dissemination • Maintains and tests the Warning Siren • Conducts community preparedness and education trainings such as CERT and Get Ready
Police Department (16 staff members)	<ul style="list-style-type: none"> • Leads the Town Emergency Management Function • Activates and coordinates actions for the Town Emergency Operations Center (EOC) • Performs emergency response activities, including evacuation, and security.

Department	Role in Disaster Mitigation and Management
	<ul style="list-style-type: none"> • Maintains dispatch center for all 9-1-1 and non-emergency call • Supports community preparedness outreach efforts
Public Works Department (6 staff members)	<ul style="list-style-type: none"> • Manages the capital improvement program • Manages Measure K-funded infrastructure improvements • Public street maintenance and repair • Storm drain and disaster related repairs • Emergency drain cleaning and fallen tree clearing • Storm water program management plans • Specifications for bidding procedures • Cleaning and maintaining all parks, public landscaping • Town facilities management
Planning & Building Department (4 staff members)	<ul style="list-style-type: none"> • Facilitates the comprehensive update of the General Plan • Processes planning and building permit applications • Conducts building inspections • Conducts resale inspections • Processes variances and Planning Commission items • Supports the Planning Commission and Design Review Board, • Assures project compliance with the environmental review process • Planning Director is the Floodplain Manager
Boards and Commissions	Role in Disaster Mitigation and Management
Town Council (5 elected members)	<ul style="list-style-type: none"> • Adopts Building and Fire Codes • Adopts Zoning Ordinances and other ordinances affecting residential and commercial development • Adopts Emergency Operations Plan • Adopts Hazard Mitigation Plans • Adopts General Plan and Required Elements
Disaster Council (membership established in Town Code, Section 2.52)	<ul style="list-style-type: none"> • Develops and recommends for adoption by the Town Council, emergency and mutual-aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements.
Planning Commission (7 resident volunteers appointed by Town Council)	<ul style="list-style-type: none"> • Carries out the provisions of the Planning and Zoning Law • Develops, adopts, and implements the Town's General Plan • Administers the Town's zoning and subdivision ordinances
Design Review Board	<ul style="list-style-type: none"> • Reviews and approves the design elements of

Department	Role in Disaster Mitigation and Management
(5 resident volunteers appointed by Town Council)	development proposals in the residential and commercial areas
Volunteer Board	<ul style="list-style-type: none"> • Conducts twice a year Creek clearing

County Agencies

Marin County Sheriff Office of Emergency Services

The Sheriff’s Office of Emergency Services (OES) provides emergency management services for the County/Operational Area including its eleven cities/towns and 300+ special districts. OES coordinates emergency operations activities among all the various local jurisdictions and develops written guidelines for emergency prevention, preparedness, response, recovery and mitigation to natural, man-made, and technological disasters. The Sheriff’s OES serves as the liaison between the State and all the local government political subdivisions comprising the Marin County Operational Area, including the Town of Fairfax.

Marin County Flood Control and Water Conservation District (MCFCWCD)

Established in 1953, the District administers flood control projects and oversees revenue collection in each of the Flood Control Zones in Marin County. The Town of Fairfax rejoined Flood Control Zone 9 (Ross Valley) in 2006, in direct response to the December 31, 2005 flood and its desire to actively participate in future watershed flood mitigation efforts. The District administers flood control projects and oversees revenue collection in each of the active Flood Control Zones in Marin.

Flood Control Zones raise money through property taxes and assessment overrides, such as the property owners’ storm drainage user fee which was approved by a majority ballot in 2007. County Code requires that projects include the purchase of land to re-establish the floodplain, flood proofing of property by raising flood prone buildings and making them watertight, construction of berms and retaining walls, and floodplain zoning. Other flood control activities undertaken in flood zones include the construction of physical facilities such as engineered stream channels, pump stations, levees and bank stabilization works.

The MCFSWCD also administers the Marin County Stormwater Pollution and Prevention Program (MCSTOPPP) which is described later in this section.

State Agencies

The roles of key state agencies that could support the Town’s flood mitigation activities are described below.

Governor's Office of Emergency Services (OES)

The OES serves as the lead state agency for emergency management in California. Among many other activities, it administers federal mitigation programs in the State, prepares the State Multihazard Mitigation Plan, and supports and oversees hazard mitigation planning activities of local governments.

Department of Water Resources (DWR)

The Department of Water Resources (DWR) is the state agency with primary responsibility for managing water in California, and for flood disaster preparedness and response. The DWR coordinates the National Flood Insurance Program (NFIP) in the State, as well as coordinating the Floodplain Management Task Force. Under contract with FEMA, DWR performs Community Assistance Visits (CAVs) every 5 years for each community participating in the NFIP to ensure that the community is implementing the minimum floodplain management criteria of the NFIP. The most recent CAV for the Town of Fairfax was completed in June 2007, and the Town was found to be in compliance with all NFIP requirements. DWR also delivers floodplain management workshops for local officials in subjects such as compliance with NFIP floodplain management criteria, preparation of elevation certificates, and flood-resistant construction.

Federal Agencies

The roles of key federal agencies involved in flood mitigation are described below.

Federal Emergency Management Agency (FEMA)

FEMA, part of the U.S. Department of Homeland Security, is the key federal agency with responsibility to help communities prepare for, prevent, respond to, and recover from disasters. The Mitigation Directorate manages the National Flood Insurance Program (NFIP) and a range of programs designed to reduce future losses to homes, businesses, schools, public buildings and critical facilities from floods, earthquakes, wildland fires and other natural disasters.

FEMA also provides mitigation funds to state and local governments through a variety of grant programs, including the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA) and the Pre-Disaster Mitigation Program (PDM).

The US Army Corps of Engineers (USACE)

The USACE, San Francisco District, has responsibility for civil works, flood control, flood fighting, environmental restoration, and Clean Water Act regulatory activities for a geographic area in the western United States that covers approximately 40,000 square miles, including the Town of Fairfax. Additionally, the USACE conducts or funds studies, including the San Pablo Bay Watershed Restoration Project. Since the 1960's,

the USACE has been involved in flood control projects for Corte Madera Creek, which were designed to reduce flooding in communities downstream of Fairfax.

Natural Resources Conservation Service (NRCS)

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) addresses natural resource conservation on private lands. NRCS works closely with local resource conservation districts and resource conservation and development councils. In California, the NRCS provides outreach, management support, engineering, resource technology, technical soil services, and watershed planning services.

The NRCS provides three types of technical and financial assistance programs for watersheds: Emergency Watershed Protection Program and Floodplain Easement Component; Watershed Protection and Flood Prevention Program; and Watershed Rehabilitation. Flood issues addressed by these programs include: watershed protection; flood prevention; erosion and sediment control; water supply; water conservation; wetland and water storage capacity; upstream flood damages; and wetland creation and restoration. Additionally, the NRCS develops conservation-related surveys and plans, including watershed plans, river basin surveys and studies, flood hazard analyses, and floodplain management assistance.

Non-Governmental Organizations

There are numerous non-government groups that contribute to flood risk reduction in the Town of Fairfax. By working with these groups, the Town can extend its resources and personnel to more effectively reach its mitigation goals. Some of the most active groups are described below.

Fairfax Volunteers

Fairfax Volunteers is a Town-sponsored group whose mission is to foster good will in the Town of Fairfax through implementation of a Volunteer Program that meets Town and community needs. Guided by a seven member Advisory Board, the Volunteers have undertaken several projects that directly support flood mitigation, healthy streams, and other disaster management objectives, including: coordination of a Volunteer Flood Response Team after the Flood of 2005; annual creek cleanups; the Stream Life Awareness Campaign; renovation of bridges throughout the Town and the Community Center; coordination of CERT training; and the Fairfax Trails Project, which included developing a map showing flood zones and emergency trails.

Sustainable Fairfax

Sustainable Fairfax is one of the first nonprofit educational organizations in Marin County to pioneer sustainability, with a legacy of educating the Town Council, supporting the community, providing services to the Town, and conducting educational events since 1999. The Sustainability Center which opened in 2007 has a permaculture

demonstration in the backyard that features flood mitigation and water reclamation for the home user.

Sustainable Fairfax has held brainstorming sessions on sustainability for Fairfax's General Plan revision. Ideas presented to the General Plan Advisory Committee included: on-site water retention; reducing runoff to the creeks; erosion control; use of drought resistant plants; and eliminating pesticide use.

Friends of Corte Madera Creek Watershed

Friends of Corte Madera Creek Watershed, an all-volunteer, non-profit organization, was founded in 1995 to protect the remaining natural ecosystems of the area, especially those relating to urbanized creeks and wetlands, and where possible to increase the diversity of these ecosystems. Friends encourages residents and businesses to adopt creek-friendly practices, and works with local governments and public agencies to advocate for policies that benefit natural ecosystems. Hands-on activities are focused on creek clean-ups and habitat enhancement projects on public property. Since the December 31, 2005 flood, the Friends of Corte Madera Creek have been involved in several activities that have supported the Town's flood mitigation efforts, including participation in the Fairfax and San Anselmo Creek Surveys; establishing high water marks; supporting the 300 Olema road streambank stabilization project; and participating in the Ross Valley Watershed Flood Protection and Creek Restoration Program.

Ross Valley Mitigation League

Established following the December 31, 2005 floods, this volunteer group has participated in several efforts to support Ross Valley Watershed communities, including identifying and mapping the high water marks.

Marin Center for Volunteer and Nonprofit Leadership (MCVNL)

The Center promotes volunteerism, strengthens nonprofits, and enhances community leadership in Marin County. As one of the Volunteer Centers of the Bay Area, the Center works with local agencies coordinating emergency preparedness and mobilizing volunteer resources to help the community when disaster strikes. The main role in responding to disasters is to mobilize emergent volunteers who want to help and connect them with organizations that need assistance. Disaster-related volunteer work may include such tasks as damage assessment, food preparation, language interpretation, and message delivery. Other tasks run the gamut from cleaning up to entering data to transporting people to answering phones.

Marin Interagency Disaster Coalition

Volunteer and private agencies are part of the Marin Operational Area's mutual aid system. The Marin Interagency Disaster Coalition (composed of the American Red Cross, The Salvation Army, Marin Community Food Bank, Volunteer Center of Marin,

Marin Interfaith Council and Marin Humane Society) is an essential element of Marin County's response to meet the care and shelter needs of disaster victims. These agencies are represented at the Marin County EOC when activated.

American Red Cross - Marin

American Red Cross - Marin, part of American Red Cross Bay Area, meets immediate emergency disaster-caused needs by providing shelter, food, clothing, and health and mental health services to address basic human needs. The Red Cross also feeds disaster victims and emergency workers, handles inquiries from concerned family members outside the disaster area, provides blood and blood products to disaster victims, and helps those affected by disaster to access other available resources. During non disaster times, the Red Cross supports the Town of Fairfax by conducting emergency preparedness training and public education materials and presentations.

Salvation Army

The Salvation Army provides numerous disaster relief services. The Salvation Army's disaster response is community based, varying from place to place dependent upon the community's situation and the magnitude of the disaster. In a disaster, The Salvation Army has the ability to provide both immediate emergency assistance and long-term recovery help. Emergency response services are activated on short notice according to an agreed-upon notification procedure, while long-term recovery is strategically planned in response to the situation, through working and partnering with many other community entities. The Salvation Army is also active in emergency preparedness and public education in the community.

4.2 Plans

The Town of Fairfax has several plans that address disaster management. These plans define important Town policies and support the ordinances and activities described elsewhere in this document. This section reviews Town plans and highlights the elements that are relevant to disaster mitigation and can support future implementation of flood mitigation actions identified in this plan.

The General Plan

All cities and counties in California are required to adopt a General Plan that lays out major policy goals to guide future development. The General Plan includes required elements, which are sections that address a variety of important topics. The element most closely related to this Flood Mitigation Plan is the Environmental Safety Element, which focuses on reducing geologic, flood and wildfire risks. Other elements also provide guidance relevant to mitigation, including the Land Use, Open Space, Housing,

Circulation and Town Center Elements. The Fairfax General Plan is currently being updated, including the Environmental Safety Element.

Capital Improvement Program

The Capital Improvement Program for the Fiscal Year 2005-2006 included several projects that support flood mitigation, including:

- Fairfax Creek Restoration Project - Watershed stabilization and flood reduction project along Fairfax Creek in the vicinity of 300 Olema Road.
- Street and Storm Drain Rehabilitation - Pastori Pipe and Wood Lane Pipe, and Cascade Drive roadway stabilization project to protect road and creek bank from further erosion
- Scenic Road Retaining Wall - Construction of a new retaining wall on the downhill side of Scenic Road

Funding for the Capital Improvement Program includes General Fund, Local Measure F and Measure K Funds, State and Federal Funds, and Creek Restoration Funds.

Town of Fairfax Emergency Operations Plan (EOP)

The EOP establishes policies and procedures and assigns responsibilities to ensure the effective management of emergency operations within the Town of Fairfax. It provides information on the Town's emergency management structure and how the emergency management team is activated.

Additionally, the plan includes threat assessments that provide a brief analysis of hazards and how those hazards could affect the Town. The document serves as the legal and conceptual framework for emergency management in Fairfax. Fairfax is part of the Marin County Operational Area which serves as the county-wide coordination point for all major emergencies and disasters, and is the link to the State Office of Emergency Services under the Standardized Emergency Management System (SEMS).

Other documents supporting emergency preparedness and response include:

- Fairfax Police Department Uniform Evacuation Protocol: includes Incident Commander Checklist, evacuation protocols, and supporting documents and forms.
- Disaster Preparedness Evacuation Planning Guide: provides information to the public on how Alerts, Warnings, and Evacuation Orders are issued and includes guidance on pre-evacuation steps to take before an emergency occurs.
- Ross Valley Flood Notification Protocol: prepared by the Marin County Office of Emergency Services for the Telephone Emergency Notification System (TENS).

4.3 Codes and Regulations

The Town of Fairfax Municipal Code of Ordinances includes codes and regulations to govern development, construction and land use activities, in addition to administrative and other functions. They include construction standards, site requirements, use limitations, study requirements and mitigation requirements which help directly or indirectly to minimize the exposure of people and property to loss or injury resulting from disasters. A brief summary description of each relevant Title and Chapter of the Code is described below, particularly as relates to the flood hazard, but also as relates to general building practices and other hazards such as fire and landslide.

Title 2: Administration and Personnel

Chapter 2.5.2 Emergency Services

Section 2.52.010 - The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the Town in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of the Town with all other public agencies, corporations, organizations and affected private persons.

Title 8: Health and Safety

Chapter 8.04 Uniform Fire Code

Adopts the 2001 California Fire Code which consists of the 2000 Edition of the Uniform Fire Code, and the Uniform Fire Code Standards published by the International Fire Code Institute, 2000 Edition.

Chapter 8.06 International Wildland-Urban Interface Code

In December 2007, the Town Council adopted the 2006 Edition of the International Wildland Urban Interface Code, regulating and governing the mitigation of hazard to life and property from the intrusion of fire from wildland exposures, from adjacent structures, and prevention of structure fires from spreading to wildland fuels in the Town of Fairfax; and further providing for the issuance of permits and collection of fees.

Chapter 8.28 Watercourses

- Defines creek as San Anselmo Creek, all its tributaries, Fairfax Creek, or any other creek, channel or watercourse wherein, during the rainy season of the year or any other time, water runs in a defined channel.
- Declares that any weeds, trees, debris, rubbish, rank growth or thing whatsoever in any creek which at any time interferes with the free and unobstructed flow of water in the creek constitutes a nuisance, and provides for summary abatement.
- Declares that it is unlawful for any person to throw, deposit or place any rubbish, debris, garbage or other personal property in any creek, or to in any way obstruct the free flow of water, in any creek at any time.

- Requires that every owner of property in the Town shall, at all times, keep free and clear of weeds, trees, debris, rubbish or any other obstruction all creeks or portions thereof which flow upon, over or across the property of the owner, and the failure to do so shall constitute a misdemeanor.
- Provides for removal of obstructions by the Public Works Director, and allows for entrance to private property for that purpose.
- Authorizes the Public Works Director to widen, straighten and deepen the channel in any creek in the Town to such an extent as to provide a channel that will carry all water normally flowing in the creek during seasonal rains.

Chapter 8.32 Urban Runoff Pollution Prevention

The intent of this chapter is to protect and enhance the water quality of the state's, and the nation's watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Clean Water Act by:

- Minimizing discharges other than storm runoff to storm drains or watercourses;
- Controlling the discharge to storm drains or watercourses from spills, dumping or disposal of materials other than rain water; and
- Reducing pollutants in storm water discharges to the maximum extent practicable.
- Specifying discharge regulations and requirements.
- Establishing criteria for inspections and enforcement.

Chapter 8.48 Regulatory Fee for Clean Water Storm Water Activities

The purpose of this chapter is to ensure the future health, safety and general welfare of the citizens of the Town by establishing a funding source to provide:

- enforcement of the Town's Urban Runoff Pollution Prevention Ordinance;
- maintenance and repair of the Town's stormwater drainage facilities;
- capital improvements to the Town's storm drainage system; and,
- other clean stormwater activities.

Title 15: Building and Construction

In December 2007, the Fairfax Town Council adopted the following codes:

- 2007 edition of the California Building Code (Title 24 Part 2) based upon the 2006 International Building Code (IBC) including Appendix Chapter 1, Administration, Appendix Chapter A, Employee Qualifications, Appendix Chapter G, Flood-Resistant Construction, Appendix Chapter H, Signs, Appendix Chapter I, Patio Covers, and Appendix Chapter J, Grading.
- 2007 edition of the California Electrical Code (Title 24 Part 3) based upon the 2005 National Electrical Code (NEC) including Annex G, Administration.
- 2007 edition of the California Mechanical Code (Title 24 Part 4) based upon the 2006 Uniform Mechanical Code (UMC) including Appendix Chapter 1, Administration.
- 2007 edition of the California Plumbing Code (Title 24 Part 5) based upon the 2006 Uniform Plumbing Code (UPC) including Appendix Chapter 1 Administration.
- 2007 edition of the California Energy Code (Title 24 Part 6)

- 2007 edition of the California Existing Building Code (Title 24 Part 10) based upon the 2006 International Existing Building Code (IEBC) including Appendix Chapter A1.

Title 16: Subdivision

Chapter 16.04 General Provisions

The purpose is to:

- Adopt regulations to supplement and implement the Subdivision Map Act of the State of California (Cal. Gov't Code, Title 7, Division 2, commencing with § 66410) and may be cited as the “Subdivisions Ordinance of the Town of Fairfax”; (In instances where this chapter is in direct conflict with the Subdivision Map Act, the latter shall control.)
- Implement the Fairfax general plan, any planned development plan or specific plan and zoning ordinance; and
- Establish reasonable standards of design and reasonable procedures for subdivision and resubdivision in order to further the orderly layout and use of land and insure proper legal descriptions and monumenting of subdivided land.

Chapter 16.08 Tentative Maps

A tentative map shall be required for all requests for a major subdivision or a minor subdivision. Section 16.08.20 identifies all mapping requirements. Listed below are the criteria most relevant to flood risk reduction:

- A topographical contour map showing accurately the existing watercourses terrain within the subdivision, existing drainage channels, roads, culverts, overhead and underground utility lines which may affect the design of the subdivision, wells and springs, major structures, irrigation ditches, utility poles and other improvements in their correct location.
- Map(s) showing area(s) of property which is (are) affected by geologic conditions posing potential safety hazard(s) and areas subject to inundation or ponding;
- Location, approximate grade, direction of flow and type of existing and proposed storm drainage channels, storm drains and retention and detention areas;
- Location, alignment and tops and bottoms of all banks of all natural drainage ways;
- Statement or plan as to proposals for draining the areas subject to 100- and 250-year flooding or inundation by waters flowing into or from the subdivision; and,
- Preliminary grading plan.

Title 17: Zoning

Section 17.040.010 General Provisions

Pursuant to the provisions of California Government Code § 65800, an official land use zoning ordinance for the Town of Fairfax was adopted and established to serve the public health, safety, comfort, convenience and general welfare, and to provide the economic and social advantages resulting from an orderly planned use of land resources, and to encourage, guide and provide for the future growth and development of the Town in accord with the Fairfax General Plan.

Section 17.040.040 Setbacks; Structures Adjacent to Fairfax and San Anselmo Creeks

- No building, accessory building, structure or swimming pool shall be constructed closer to the top of the stream bank of the Fairfax and San Anselmo creeks than 20 feet or two times the average depth of the bank, whichever is greater, without authorization by variance, except for retaining walls and bulkheads which replace failing structures and which do not increase the height, width, length or configuration of the original structure.
- All structures approved under this section must comply with the requirements in Chapter 8.24, Watercourses, of this code.

Section 17.068.30 Floodplains: Statement of Purpose

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- protect human life and health;
- minimize expenditure of public money for costly flood control projects;
- minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- minimize prolonged business interruptions;
- minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in the areas of special flood hazard;
- help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;
- insure that potential buyers are notified that property is in an area of special flood hazard; and
- insure that those who occupy the areas of special flood hazard assume responsibility for their actions.

Section 17.068.040 Methods of Reducing Flood Losses

In order to accomplish its purposes, this chapter includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve the uses, be protected against flood damage at the time of initial construction;

- Controlling the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel flood waters;
- Controlling filling, grading, dredging and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

4.4 Programs and Mitigation Activities

Town of Fairfax Activities

Repair of Town Facilities Damaged in the December 31, 2005 Flood

The Town of Fairfax is committed to completing the repair of Town facilities in a way that both reduces the potential for damage from future floods and contributes to healthier creeks. The Town has been working in concert with the Federal Emergency Management Agency and the State Office of Emergency Services to expedite the design, review and construction of necessary projects.

Although the Town Hall has suffered flood damage in numerous flood events, and elevation or relocation of the structure is highly desirable, it was found that it was not cost effective to do so. Therefore, wet flood proofing and flood gates were installed to provide protection in the future.

In respect to damaged bridges and drainage culverts, the Town commissioned a study by Fluvial Geomorphology Consulting (FGC) in July 2006. The main purpose of the study was to evaluate the potential of biotechnical bank stabilization and riparian and aquatic habitat protection and enhancement as part of necessary repair work at six project sites. The resulting report provided recommendations for approximately 200 flood management improvement projects along Fairfax and San Anselmo Creeks, most of which would suit the dual purpose of flood risk reduction and habitat restoration.

Flood Mitigation and Creek Restoration - 300 Olema Road

The area in the vicinity of 300 Olema Road has a history of repeated flooding. In 2006, the Town initiated a flood mitigation and creek restoration project in conjunction with the Department of Water Resources Urban Streams Restoration Program, the Friends of Corte Madera Creek Watershed, the Marin Conservation Corp, and the Ross Valley Sanitary District. The project is made up of several components including: replacing the undersized culvert with a single span bridge and removing one wall and the bottom of the concrete channel; widening the natural channel downstream of 300 Olema; providing erosion control through plantings and installation of a willow wall and mattress; and installation of a drip irrigation system. Unfortunately the project has not yet been completed due to difficulties encountered with a property owner who would be affected by the channel widening portion of the project.

Creek Clean-Ups

A creek-wide clearing and clean-up took place in September 2006, accomplished through the joint efforts of the Marin Conservation Corps, the Towns, and the County. Items which could cause major blockages in the coming winter rainy season such as debris, overgrown vegetation, and branches were removed from the creeks.

This was in addition to the annual Creek Clean-up which is coordinated by the Fairfax Volunteers each October. Each year volunteers gather debris and construct a temporary sculpture in the park to raise awareness of how much refuse finds its way into the watershed. The 2007 effort focused on Cascade and Fairfax Creeks.

Flood Gate Program for Commercial Properties

As an incentive to local businesses who suffered damage in the last flood, the Town Council approved the waiver of permit fees for the installation of floodgates for any structure in Town, a savings of approximately \$80 per installation. A further incentive was later provided by making matching funds available for the purchase and installation of the flood gates. The Town is allocating a portion of the ERAF excess funds to support this project.

Flood Warning and Notification

Creek Depth Monitoring Device:

A creek depth monitoring device was installed in the Fairfax Creek behind the Youth Center, adjacent to the Town Hall and Police Station. It is solar powered and is connected to a remote computer monitoring system that can send notices to staff computers and cell phones when the creek reaches a critical level. The Mayor, Town Manager, Police Chief, Fire Chief, and Public Works Director analyze the data and make a determination regarding activation of the siren and notification procedures. Real time data is also provided via the Town website and through the Ross Valley Fire Department website so that any resident or interested party can log on during a rain event to monitor the potential for flooding. The monitoring device will also be useful in the effort to collect better data for the Ross Valley Watershed hydrology effort.

Siren Warning System:

As part of a Disaster Awareness Program, the Town Council approved the installation of three emergency warning sirens to be installed throughout the Town. The first of the sirens was installed in the Fairfax Corporation Yard. The purchase and installation of the sirens was funded through a \$50,000 grant from Marin County Supervisor Hal Brown, Measure F, and PG&E, who donated and installed the utility pole. The siren is a Federal Signal Corporation Eclipse 8 siren, which sits atop a 70-foot pole. With 360 degree omni-directional coverage, it is expected to reach one mile in all directions, and will be very effective in notifying residents of imminent flood danger. Residents are advised to

tune to local radio and television stations for information when they hear the siren (KCBS 740, KGO 810, or KTVU Channel 2).

Notification:

The Town of Fairfax has joined with other Ross Valley communities in using the Telephone Emergency Notification System (TENS) to provide local residents with hazard information in a timely and effective manner. The Marin County Office of Emergency Services coordinated the formation of the Ross Valley Flood Notification Area and will provide the notifications according to protocols established jointly by the participating jurisdictions.

Community Preparedness Activities Undertaken Since December 31, 2005

- Rejoined Flood Control District 9
- Reactivated the Town of Fairfax Citizen's Disaster Council
- Created a Disaster Preparedness web page on the Town web site
- Held 2 Disaster Preparedness Fairs in 2006
- Distributed Emergency Plan Brochure at Town Hall, Police Department and several local businesses that contributed funds to secure the brochures
- Continued providing sand and sandbags for residents and businesses
- Distributed flood and creek tips to targeted groups in advance of severe storms

Get Ready Ross Valley:

The Ross Valley Fire Department and the Ross Valley Firefighters Club, in conjunction with Marin County Get Ready has conducted numerous two-hour neighborhood disaster preparedness trainings to residents, Town employees, schools districts, and other interested parties. This community based program is designed to train resident trainers who can in turn provide the training in their neighborhood. The program emphasizes basic skills and preparation needed before, during and after a disaster to survive on your own for 72 hours and support community needs as well. It is estimated that more than 300 people have received the training in the Ross Valley.

Community Emergency Response Team (CERT) Training:

The Ross Valley Fire Department also conducts CERT Training in the community. The goal is to train individuals to be self-sufficient in the immediate hours and days following a major disaster. The training is provided over a period of 2-3 days, using hands on scenarios and problem solving. Community Emergency Response Teams are trained in basic emergency response procedures such as: conducting an initial size-up of the situation in their immediate area; reducing immediate dangers by turning off utilities, suppressing small fires, and evacuating hazardous areas; performing immediate medical triage and basic treatment of injuries; assessing structural integrity and performing light search and rescue; collecting and recording vital information to be relayed to professional responders on damage, victims, and actions taken or resources needed; and, providing leadership to untrained volunteers.

Other Local Agency Mitigation Programs

Marin County Stormwater Pollution Prevention Program (MCSTOPPP)

Formed in 1993, MCSTOPP is a joint effort of Marin's cities, towns and unincorporated areas. Their goal is to: prevent stormwater pollution; protect and enhance water quality in creeks and wetlands, preserve beneficial uses of local waterways; and comply with State and Federal regulations. Though the County and each of the eleven cities and towns carry out their own individual stormwater pollution prevention programs, MCSTOPP provides for the coordination and consistency of approaches between the individual participants and documents their efforts in annual reports. These reports include information on illegal discharges, street cleaning efforts, creek maintenance, new development, and other issues of concern. MCSTOPP provided a small grant to the Stream Life Awareness Campaign Committee to support the fabrication of steelhead crossing signs produced by Manor School students.

Ross Valley Watershed Flood Protection and Creek Restoration Program (RVWP)

This program was initiated in January 2006, in response to the December 31, 2005 floods that impacted many Marin County communities, to create a comprehensive strategy for the entire Ross Valley Watershed. Led by the County of Marin Department of Public Works, the Program is a collaborative effort that includes the City of Larkspur and Towns of Fairfax, Ross and San Anselmo. The goal of the program is for the involved communities to agree on short-, mid-, and long-term flood protection measures for the Ross Valley, and to conserve and enhance the Ross Valley creek network. Objectives of the program include:

- Complete the Corte Madera Creek Flood Control Project
- Perform essential maintenance for flood conveyance
- Initiate flood protection for Kentfield, upper Ross, San Anselmo and Fairfax
- Institute state of the art flood early warning and emergency response systems
- Integrate fish passage and habitat restoration in flood protection measures.

Following hydrologic studies, and creek walks to identify points of constriction, the program identified eight priority solutions, one of which is to replace the Downtown Fairfax culvert, which is undersized and the main cause of flooding in the Town. It was also suggested that there may be potential sites for retention basins upstream to reduce the runoff flow to the culvert. Additional hydraulic modeling is planned for Fairfax Creek from Lansdale Station to 300 Olema Road to provide more detailed analysis of cost effective options for Fairfax.

Federal and State Programs

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a congressionally authorized program to reduce the costs and impact of flooding across the United States. Under this program, the Federal government makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods. Fairfax meets the requirements for NFIP compliance through Section 17.068 of the Town Code.

Flood insurance reduces the cost of Federal disaster assistance – according to FEMA, every three dollars paid in flood insurance reduces disaster assistance payments by one dollar. However, the NFIP achieves its greatest fiscal impact by encouraging communities to reduce flood risks. FEMA estimates that sound floodplain management practices reduce flood damage by \$1 billion annually; and that buildings constructed in compliance with NFIP requirements are likely to suffer 80 percent less damage annually than non-compliant buildings.

To encourage communities to increase the effectiveness of floodplain management programs, FEMA has implemented the Community Rating System (CRS). Under the Community Rating System, communities receive credit for implementing floodplain management measures that go beyond the minimum criteria of the NFIP. For example, when a community moves from a Level 10 (the basic level of participating) to Level 9, flood insurance policy holders receive a five percent discount on their insurance premiums. The CRS grants credits for eighteen different activities that fall under four categories: Public Information (six activities); Mapping and Regulations (five activities); Flood Damage Reduction (four activities); and Flood Preparedness (three activities). The maximum premium reduction a community can receive under the CRS is 45%. Currently, the Town of Fairfax is exploring participation in the CRS. As of October 2007, there were 170 NFIP policies in effect in the Town, at a total annual premium of \$134,229.

Small Watershed Program

The Small Watershed Program, authorized under Federal law in 1944 and 1954, is administered by NRCS. This funding program serves three general purposes: 1) to prevent damage from erosion, floodwater, and sediment; 2) to further the conservation development and disposal of water; and 3) to promote the conservation and proper utilization of land. The Small Watershed Program achieves these goals through watershed surveys and planning and watershed and flood prevention operations and construction. The Small Watershed Program, which is limited to watersheds of 250,000 acres or smaller, has funded over \$100 million for flood control, agricultural management and watershed protection in the State of California.

4.5 Financial Resources

While some mitigation activities can be carried out without significant cost, others need a substantial expenditure. The financial resources listed below are potentially available to the Town to pursue the flood mitigation measures identified in this plan.

Federal and State Funding Sources

Federal and state mitigation funding sources are described below. A matrix of key mitigation grant programs showing eligibility criteria, types of projects, and match requirements is included in the Appendix.

Hazard Mitigation Grant Program (HMGP)

This FEMA administered program provides grants to states and local governments following a presidential disaster declaration. The funds can be used to implement long-term hazard mitigation measures. According to the Disaster Mitigation Act of 2000, communities must have an approved Local Hazard Mitigation Plan (LHMP) to receive HMGP funds after May 1, 2005. Funds will be granted only to projects that conform to local and state mitigation plans. Federal grant funds can provide 75 percent of a project's total cost; other sources must provide 25 percent matching funds.

Pre-Disaster Mitigation Program (PDM)

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis. In fiscal year 2007, \$100 million was available for PDM competitive grants, technical assistance and program support. FEMA grants can fund 75 percent of a project; other non-federal sources must provide 25 percent matching funds.

Flood Mitigation Assistance Program (FMA)

FMA is a program under the National Flood Insurance Program (NFIP) that provides funding for states and communities to prepare Flood Mitigation Plans and conduct flood mitigation projects. Communities are encouraged to prioritize projects relating to repetitive loss properties. A community must have a Flood Mitigation Plan to receive a FMA grant, and only projects specified in that plan are eligible for grants. FEMA contributes 75 percent of a project's cost; other non-federal sources must provide 25 percent matching funds. Preparation of this Flood Mitigation Plan was supported by a FMA grant.

Repetitive Flood Claims (RFC) Grant Program

The Repetitive Flood Claims Grant Program provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claims payments for flood damages. RFC funds may only mitigate structures that are located within a State or community that cannot meet the requirements of the Flood Mitigation Assistance (FMA) Program (described above), for either cost share or capacity to manage the activities. The long-term goal of the RFC is to reduce or eliminate claims under the NFIP through mitigation activities that are in the best interest of the NFIP. The RFC Program was launched by FEMA in 2006, at a funding level of \$10 million nationwide. Only mitigation projects for acquisition of insured properties that have one or more claim payments for flood damages, and either demolition or relocation of structures, with conversion of property to deed restricted open space uses, are eligible. All RFC grants are eligible for up to 100 percent Federal assistance.

Increased Cost of Compliance (ICC)

Increased Cost of Compliance provides NFIP-insured property owners with substantial flood damage with up to \$30,000 to bring a home or business into compliance with the local floodplain ordinance through elevation, floodproofing, relocation, or demolition. Eligible properties must have sustained “repetitive damage”, or damage by flooding twice in the past 10 years, where the cost of repairing the flood damage, on average, equaled or exceeded 25 percent of the property market value at the time of each flood. Also, there must have been flood insurance claim payments for each of the two flood losses and the community’s floodplain management ordinance must have a repetitive loss provision. Through a separate claim process, owners of flood damaged property may apply for up to \$30,000 to help pay for flood mitigation projects carried out in compliance with local floodplain ordinance requirements, including: floodproofing, relocation, elevation, or demolition.

Property owners may file ICC claims if: 1) the local community determines the home or business meets the substantial damage criteria (outlined in the Town flood damage protection ordinance); or, 2) the community must have a repetitive loss provision in its floodplain management ordinance, and must determine that the home or business meets the eligibility criteria listed above. Because of increasing property market values, more properties may qualify under the substantial damage criteria than the repetitive loss criteria.

Community Development Block Grant (CDBG)

Block grants are administered by the Department of Housing and Urban Development to fund housing, economic development, public works, community facilities and public service activities serving lower income people. These funds can be used for mitigation works. CDBG funds are considered local funds once they are received, and thereby are eligible to provide the 25 percent local match required for receipt of the federal mitigation grant funds.

Emergency Watershed Program Assistance

The Natural Resources Conservation Service (NRCS) implements the Emergency Watershed Protection Program, in response to emergencies caused by natural disasters. The program offers emergency assistance to jurisdictions and special districts after a disaster causes impairments in a watershed. The program works on a 75 percent Federal and 25 percent local match cost-sharing basis. Eligible activities include bank reinforcement, levee and structural repair, reseeding of damaged areas, and debris removal from stream channels, road culverts and bridge abutments.

Local Funding Sources

The Town of Fairfax General Fund supports the ongoing mitigation activities of the Town, such as enforcing disaster resistant building codes and other regulations described earlier in this section. These funds are raised through property taxes, fees, and special assessments. Some of the proposed mitigation strategies outlined in this plan can be implemented through existing staff resources and with special funds as described below. However, it is recognized that external funding sources, such as federal or state grants will be required to support local funding sources.

Measure K Bond Assessment for Capital Projects

Measure K was placed on the November 1999 election ballot to gain voter approval to issue bonds to supplement the Fairfax General Fund revenues in order to maintain safe neighborhoods, streets and community facilities; repair and resurface neighborhood streets and major corridors; replace 60 year old stormdrains; repair leaky roofs and make seismic upgrades to community facilities; and make sidewalks more accessible to the disabled. The ballot measure passed with the require two-thirds majority vote and bonds in the amount not to exceed \$6.83 million were authorized. These funds support both on going maintenance activities such as street resurfacing, as well as mitigation activities.

Storm Runoff Fee

In 1995, the Town established a funding source to provide enforcement of the Town's Urban Runoff Pollution Prevention Ordinance, to provide maintenance and repair of the Town's stormwater drainage facilities, to provide capital improvements to the Town's storm drainage system, and to provide other clean stormwater activities. The charge is per "run-off unit" as set forth in the Municipal Code and is \$15 per run-off unit which is collected with the property tax roll.

Flood Control District 9 Drainage User Fee

Marin County Flood Zone 9, which includes Fairfax, held an election in 2007 which added an assessment not to exceed \$180 for a single-family home to provide for flood protection and watershed improvements. The assessment gained a simple majority approval, however, the election outcome is currently being challenged in the courts,

resulting in a delay in spending the fees that are being collected with property taxes. This fee is designed to assist with the implementation of many of the recommendations developed by the Ross Valley Watershed Flood Protection and Creel Restoration Program.

Excess Educational Revenue Augmentation Fund (ERAF)

ERAF is a mechanism enacted in 1992 by the State, to shift local tax revenues from cities, counties, and special districts to a state ERAF fund. The State uses this fund to help school and community college districts meet minimum funding requirements. The “Excess ERAF” refund to the County is the result of the local tax base increasing at a rate faster than the increase in the State funding limits for schools and community colleges. The “excess” is proportional to each city’s contribution as set forth by state statute. ERAF funds received in 2007 are being used to support the commercial business flood gate incentive program, and to fund a one-year part-time position to assist the Town in working with FEMA to complete damage repairs resulting from the December 31, 2005 flood, as well as seeking an improved rating in the NFIP Community Rating System and exploring other grant fund opportunities.

Section 5: Goals, Objectives, and Strategies

5.1 Overall Goal

To reduce personal injury, loss of life, and damage to property and the environment from flood hazards.

5.2 Considerations for Mitigation Planning & Risk Reduction

Based on information gathered and input provided during the planning process, the following considerations guided the development of the flood mitigation objectives and strategies.

- Historic records of flooding in Fairfax are incomplete.
- Hydraulic studies do not adequately address all potential flooding sources.
- Information on location, condition and adequacy of storm drain components is incomplete.
- There is a need and desire to join with neighboring communities for watershed planning (i.e., Ross Valley Watershed Program).
- Flood Control District 9 may provide financial support for certain flood risk reduction measures, but alternative funding sources and/or financial incentives must be identified.
- Floodplain management ordinance meets minimum requirements for participation in the National Flood Insurance Program.
- Public Information and Education to promote community action are key elements of risk reduction.
- Creek ownership and stewardship requires a public/private approach to risk reduction.
- Multiple regulatory agencies have approval authority for creek related activities.
- Mitigating Repetitive Loss Properties is a federal priority.
- Fairfax could qualify for reduced flood insurance rates under the Community Rating System of the National Flood Insurance Program.
- The annual Neighborhood Creek Clean-up Program is effective.
- Water quality, habitat protection, and fish passage are important elements of flood management activities.
- Implementation will require a proactive effort to leverage diverse funding sources, technical expertise, and human resources.
- Cost-effectiveness is a primary concern in determining feasibility of future mitigation projects. Additional studies must be completed to provide data for benefit-cost analyses of proposed mitigation strategies.

5.3 Objectives/Strategies

Objective 1:

Assure that adequate and up to date flood hazard information and maps are available and utilized to guide decisions that impact flood vulnerability, exposure, and risk.

- 1.1 Review newly released Flood Rate Insurance Maps, make map information available to the public and ensure the most up to date information is used for permit and plan review.
- 1.2 Complete the hydrologic study for Fairfax Creek.
- 1.3 Review the hydrologic study conducted by the Ross Valley Watershed Program and identify areas where additional watershed analysis of runoff and drainage systems are necessary to complete a comprehensive survey of insufficient capacity in the storm drain and natural creek system.
- 1.4 Document and maintain creek depth monitoring data during significant storm or flood events to contribute to the understanding of the flood hazard.
- 1.5 Document past flood history and damages to quantify flood impacts and support benefit cost analysis of flood mitigation measures.
- 1.6 Complete identification and mapping of high water marks from the December 31, 2005 flood and enter into Geographic Information System maintained by Marin Maps.

Objective 2:

Update and enforce Town codes and ordinances to minimize the risks of flood hazards.

- 2.1 Continue to enforce the Town of Fairfax Flood Ordinance (Section 17.068 of the Municipal Code) for all development, redevelopment or substantial improvement projects in the floodplain and floodway, through the permit review process.
- 2.2 Continue to comply with all requirements of the National Flood Insurance Program.
- 2.3 Explore potential for enhancing current building codes or design standards that will result in a watershed based design approach to drainage.
- 2.4 Ensure that drainage systems in new or substantially improved development are designed and constructed to reduce off-site flow and encourage the use of permeable paving and on-site stormwater retention.
- 2.5 Prepare and adopt an ordinance to encourage the use of permeable surfaces for driveways, patios, walkways, etc. in new development or substantial improvements.
- 2.6 Amend flood management ordinance to require additional creek setbacks and/or increased elevation above base flood elevation for new development or substantial improvements.
- 2.7 Ensure that storm drainage systems are adequate to accommodate new development and substantial improvements by requiring owner to pay the cost of any required improvements to the existing drainage system necessitated by the proposed development.
- 2.8 Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring that lots and rights-of-way are laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. Design criteria should be calculated based on saturated soils.

Objective 3:

Reduce community risk and vulnerability through maintaining and improving drainage systems.

- 3.1 Reduce the impact of future floods on community services by aggressively seeking funding to elevate or relocate critical town facilities including the Town Hall, Police Station and Fire Station.
- 3.2 Repair damaged culverts, drains, and bridges to withstand future flooding and incorporate streambank erosion and fish passage solutions.
- 3.3 Identify cost-effective and technically feasible structural improvements to the Downtown Fairfax culvert (under Sherman Avenue) and the culvert running behind Dominga that results in damage to Bolinas Avenue businesses.
- 3.4 Conduct an inventory and analysis of town maintained storm drains and culverts, including age, size, materials, etc. Determine any inadequacies in meeting current capacity needs, and prioritize necessary improvements. Prepare a Storm Drain Master Plan.
- 3.5 Consider the downstream impacts of culvert improvements/enlargements on streambank erosion and existing retaining walls.
- 3.6 Review and prioritize recommendations for flood management measures included in the report “Geomorphic Assessment of Town of Fairfax Project Sites”.
- 3.7 Locate and mark all storm drains/culverts and identify area and properties draining into each.
- 3.8 Continue maintenance efforts carried out by the Public Works Department to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate), to allow for free flow of water.
- 3.9 Continue to support community volunteer efforts prior to and during the rainy season to monitor creeks and drainage culverts and remove visible obstructions.
- 3.10 Consider assigning storm drains monitoring and clearing to the community of properties served by them.

Objective 4:

Increase the mitigation capability of residents, business owners and others who could be affected by floods.

- 4.1 Provide property owners with educational materials that describe the upstream/downstream impacts, drainage systems, and stormwater runoff implications of individual actions on watersheds and creeks.
- 4.2 Partner with Sustainable Fairfax, the Ross Valley Mitigation League, the Friends of Corte Madera Creek Watershed and similar groups to develop and distribute educational materials and provide training to the community on ways to reduce the impacts of flooding on their property, their neighbor's properties and the community as a whole.
- 4.3 Continue to hold the annual community creek clean up day prior to the winter storm season.
- 4.4 Provide property owners with educational materials that describe locally appropriate techniques for bank stabilization and erosion control that can reduce flooding and promote healthy creeks.
- 4.5 Encourage home and apartment owners and commercial business owners to participate in structural elevation programs that will protect property.
- 4.6 Identify and aggressively seek available grant funds to support residential and commercial elevation projects and projects that decrease runoff and increase stormwater detention.
- 4.7 Provide financial incentives, technical guidance and a public outreach campaign for commercial business owners to install flood gates at the entrance to their property.
- 4.8 Encourage owners of properties in a floodplain to consider purchasing flood insurance, by including flood insurance information in community flood preparedness materials, and seeking a higher Community Rating System (CRS) rating for the Town of Fairfax that will result in policy premium reductions.

Objective 5:

Increase the Town's capacity to respond to and recover from emergencies and disasters caused by flood hazards.

- 5.1 Complete installation of warning sirens to inform the public of imminent flood potential.
- 5.2 Develop and disseminate protocols for activation of warning sirens, TENS/MEANS, and other flood notification measures, and include them in the Emergency Operations Plan.
- 5.3 Conduct public education program to inform residents of appropriate measures to take when an alarm is sounded and document flood evacuation procedures in Emergency Operations Plan.
- 5.4 Make sandbags and plastic sheeting available to residents in anticipation of rainstorms. Facilitate access by publicizing distribution locations, providing a sandbag filling device and providing assistance to the disabled and elderly upon request.
- 5.5 Maintain the Disaster Preparedness web site to include flood and disaster preparedness information and links to flood prevention and mitigation resources.
- 5.6 Conduct annual flood awareness campaign.
- 5.7 Continue to provide community emergency preparedness training through the CERT and Get Ready programs.
- 5.8 Continue the Citizen's Voluntary Creek Monitoring Group that formed after the 12/31/05 flood; support and value this effort.

Objective 6:

Continue to support watershed based planning efforts to further comprehensive flood mitigation planning and implementation of mitigation measures.

- 6.1 Continue to participate in the Ross Valley Watershed Program and Flood Control District 9.
- 6.2 Conduct a cost benefit analysis of flood risk reduction projects proposed under the Ross Valley Watershed Program to identify those measures which will have the greatest benefit to the Town of Fairfax.
- 6.3 Work cooperatively with upstream and downstream communities to monitor creek and watercourse flows to predict potential flooding.
- 6.4 Work to solve ongoing localized flooding issues on private property, without taking on further liability risk for the Town.
- 6.5 Encourage other special districts (e.g., Ross Valley Sanitary) to take responsibility and action for their infrastructure that may be contributing to flooding or fish passage barrier situations.

5.4 Setting Priorities for Flood Mitigation Actions

Federal regulations guiding the development and approval of the Flood Mitigation Plan require that a priority be assigned to each mitigation action included in the Plan.

Disaster Council and Technical Oversight Committee Members were asked to assign a priority rank for each of the draft mitigation actions included under the six objectives on the previous pages.

Each action was assigned a rank of 1, 2, or 3, with a rank of 1 being the highest priority ranking, and 3 being the lowest in priority.

Factors which were considered when assigning a priority rank included:

- potential effectiveness of the action in reducing future flood damage
- ease of implementation
- multiple objectives achieved
- overall feasibility (given social, technical, administrative, political, legal, environmental, and economic conditions)

Those items assigned a rank of 1 by over 50% of the respondents, and receiving an average score of 1.5 or lower, were included in the Implementation Strategy.

5.5 Implementation Strategy

The Implementation Strategy is designed to help the community achieve its overall goals and objectives for flood risk reduction. A strategy has been developed for each of the highest priority mitigation actions identified through the planning process. There are three key elements included in the following implementation strategy matrix: responsible agency, timeframe, and funding.

Responsible Agency

Flood mitigation is not the responsibility of any single person or department, but rather involves many players from the public and private sector. For each mitigation action, key Town Departments are identified as well as external governmental and multi-jurisdictional agencies, and volunteer groups who have been actively involved in community efforts to reduce the flood risk. Additional partners may be identified as various actions are pursued.

Timeframe

The Implementation Strategy recognizes a five-year planning horizon. For mitigation actions identified as “on-going”, they are expected to continue on a periodic or annual basis. Others have been assigned a one to two year timeframe based on efforts underway or expected to be initiated and completed within that timeframe. Other, more complex projects are expected to take a longer period of time to implement, and may extend well beyond the five-year timeframe.

Funding

This column includes information on potential funding sources that could be applied to or pursued to implement each mitigation action. The Town of Fairfax has limited resources and recognizes that external funding will be required to implement most structural projects. In some cases, specific programs are cited; in other cases, they have not yet been identified. It should be noted that many of the on-going programs are supported through the annual budget process and through volunteer efforts which are crucial to success of flood risk reduction activities in the community.

Objective 1: Assure that adequate and up to date flood hazard information and maps are available and utilized to guide decisions that impact flood vulnerability, exposure, and risk.	Responsibility	Timeframe	Funding
1.1 Review newly released Flood Rate Insurance Maps, make map information available to the public and ensure the most up to date information is used for permit and plan review.	Planning	On-Going	General Fund
1.2 Complete the hydrologic study for Fairfax Creek.	RVWP Public Works Consultant	2008	FEMA FCD 9
1.4 Document and maintain creek depth monitoring data during significant storm or flood events to contribute to the understanding of the flood hazard.	Ross Valley Fire Dept.	On-Going	General Fund RVFD Fund
1.5 Document past flood history and damages to quantify flood impacts and support benefit cost analysis of flood mitigation measures.	Public Works Volunteer Groups	2008-09	External Funding Required
1.6 Complete identification and mapping of high water marks from the December 31, 2005 flood and enter into Geographic Information System maintained by Marin Maps.	Public Works Consultant Volunteer Groups	2008-09	External Funding Required

Objective 2: Update and enforce Town codes and ordinances to minimize the risks of flood hazards.	Responsibility	Timeframe	Funding
2.4 Ensure that drainage systems in new or substantial improved development are designed and constructed to reduce off-site flow, and encourage the use of permeable paving and on-site stormwater detention.	Building Planning	On-Going	General Fund
2.7 Ensure that storm drainage systems are adequate to accommodate new development and substantial improvements by requiring owner to pay the cost of any required improvements to the existing drainage system necessitated by the proposed development.	Building Planning	On-Going	General Fund
2.8 Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring that lots and rights-of-way are laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. Design criteria should be calculated based on saturated soils.	Building Planning Sanitary District	On-Going	General Fund

Objective 3: Reduce community risk and vulnerability through maintaining and improving drainage systems.	Responsibility	Timeframe	Funding
3.2 Repair damaged culverts, drains, and bridges to withstand future flooding and incorporate streambank erosion and fish passage solutions.	Public Works FEMA/OES	2008-2009	FEMA/OES General Fund
3.4 Conduct an inventory and analysis of town maintained storm drains and culverts, including age, size, materials, etc. Determine any inadequacies in meeting current capacity needs, and prioritize necessary improvements. Prepare Storm Drain Master Plan.	Public Works Consultants	2008-2010	External Funding Required
3.7 Locate and mark all storm drains/culverts and identify area and properties draining into each.	Public Works Volunteer Groups Property Owners Consultants	2008-2013	External Funding Required
3.8 Continue maintenance efforts carried out by the Public Works Department to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate), to allow for free flow of water.	Public Works	On-Going	General Fund
3.9 Continue to support community volunteer efforts prior to and during the rainy season to monitor creeks and drainage culverts and remove visible obstructions.	Public Works Volunteer Groups Property Owners	On-Going	General Fund

Objective 4: Increase the mitigation capability of residents, business owners and others who could be affected by floods.	Responsibility	Timeframe	Funding
4.3 Continue to hold the annual community creek clean up day prior to the winter storm season.	Fairfax Volunteers	Annual	General Fund
4.6 Identify and aggressively seek available grant funds to support residential and commercial elevation projects and projects that decrease runoff and increase storm water detention.	Public Works	2008-2013	HMGP/FMA Grants
4.7 Provide financial incentives, technical guidance and a public outreach campaign for commercial business owners to install flood gates at the entrance to their property.	Public Works Building Chamber of Commerce	2008	ERAF Grant

Objective 5: Increase the Town's capacity to respond to and recover from emergencies and disasters caused by flood hazards.	Responsibility	Timeframe	Funding
5.1 Complete installation of warning sirens to inform the public of imminent flood potential.	RVFD	2008	Grants PG&E
5.3 Conduct public education program to inform residents of appropriate measures to take when an alarm is sounded and document flood evacuation procedures in Emergency Operations Plan.	Disaster Council RVFP Police	2008	General Fund
5.7 Continue to provide community emergency preparedness training through the CERT and Get Ready programs.	RVFP Marin County OES	On-Going	Grants
5.8 Continue the Citizen's Voluntary Creek Monitoring Group that formed after the 12/31005 flood; support and value this effort.	Public Works Town Manager	On-Going	General Fund

Objective 6: Continue to support watershed based planning efforts to further comprehensive flood mitigation planning and implementation of mitigation measures.	Responsibility	Timeframe	Funding
6.1 Continue to participate in the Ross Valley Watershed Program and Flood Control District 9.	Town Council Town Manager Public Works	On-Going	General Fund
6.3 Work cooperatively with upstream and downstream communities to monitor creek and watercourse flows to predict potential flooding.	All Town Departments	On-Going	General Fund
6.4 Work to solve ongoing localized flooding issues on private property, without taking on further liability risk for the Town.	Planning Public Works	2008-2013	General Fund Federal Grants
6.5 Encourage other special districts (e.g. Ross Valley Sanitary) to take responsibility and action for their infrastructure that may be contributing to flooding or fish passage barrier situations.	Town Manager Public Works	2008-2013	General Fund

Section 6: Plan Maintenance Process

To ensure the Plan stays current and incremental progress is made on implementing the mitigation strategies, the Town of Fairfax will make every effort to update this Plan every five years. However, the Town may update this Plan at its own discretion any time prior to that if new hazard information becomes available, priorities for implementation change, an actual flood event occurs, or other circumstances prompt an update.

6.1 Monitoring, Evaluating and Updating the Plan

The Town of Fairfax will use similar mechanisms to monitor and update the Plan as were used to develop the Plan. The Town Manager will assume the leadership role in monitoring the progress of plan implementation, with a focus on the highest priority actions. Key departments with responsibility for mitigation implementation will continue to actively participate in the process. All plan updates will be subject to the public input and review process that is a part of all plan development in the Town of Fairfax.

On an annual basis the Town Manager will solicit progress reports from the department(s) assigned responsibility for implementation of each of the highest priority mitigation actions outlined in the Implementation Strategy. Data will be collected on the status of the mitigation action in order to identify those actions that have been completed, those that have been delayed, obstacles encountered, resources required, and other items that impact implementation. The progress reports will be compiled, and adjustments made to the Implementation Strategy to reflect the current status of each mitigation initiative. Suggestions for changes in priorities of existing actions may be made at that time, as well as suggestions for new mitigation actions to be incorporated into the next update of the Plan.

6.2 Implementation Through Existing Programs

The mitigation objectives and actions outlined in the previous section are designed to be carried out through the normal governmental and operational mechanisms used by the Town in the performance of its duties and responsibilities on a day to day basis. For example, any code revisions or updates will be accomplished using standard procedures for code development. Structural improvements to buildings and infrastructure will be incorporated into the Town of Fairfax Capital Projects Plan and be subject to that process. To the extent possible, mitigation projects are most successful when fully integrated into on-going programs and mechanisms rather than establishing parallel or new mechanisms for implementation. Therefore, the Town will strive to fully incorporate the Implementation Strategy Plan into existing programs.

Additionally, to ensure consistency with overall Town development policies, the Town Council Resolution adopting this Plan also stipulated the Flood Mitigation Plan as an Annex to the Fairfax Local Hazard Mitigation Plan and an Appendix to the General Plan Environmental Safety Element.

However, in this era of increased demands and constrained resources at all levels of government, the lack of resources, especially from external sources, may hamper the ability of the Town to implement some mitigation actions identified in the plan or to implement them within the timeframe specified.

6.3 *Continued Public Involvement*

The Town of Fairfax values the role its community members play in the plan development process, and the contributions made in support of this Plan. The Town Manager will post any progress reports or proposed updates to the Plan on the Town website. At such time as the Town proceeds with a formal update of the Plan, a community stakeholders meeting will be held to solicit public comment and input. All draft updates will be posted on the website and a public review period and hearing will be conducted prior to finalizing the draft for submission to the Town Council.

References

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Federal Emergency Management Agency, National Flood Insurance Program Community Rating System Coordinator's Manual, FIA-15/2006.

Federal Emergency Management Agency, National Flood Insurance Program, Program Description, August 1, 2002.

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Marin County Public Works Department. 1966. Storm Drainage Study for the Fairfax Area. Prepared for the City of Fairfax and the Marin County Planning Department By Marin County Flood Control District.

Creek Care, A Guide for Marin Residents, Marin County Stormwater Pollution Prevention Program. www.mcstopp.org

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Stetson Engineers Inc., Fluvial Geomorphology Consulting, Friends of Corte Madera Creek Watershed, A Framework for Developing Effective Management Solutions to Flooding in the Ross Valley Using Hydraulic Modeling, April 2006.

Ross Taylor and Associates, Corte Madera Stream Crossing Inventory and Fish Passage Evaluation. Prepared for Friends of the Corte Madera Creek Watershed. February 2006.

List of Acronyms

ABAG	Association of Bay Area Governments
CAV	Community Assistance Visits
CDBG	Community Development Block Grant
CERT	Community Emergency Response Team
CFS	Cubic Feet per Second
CMSA	Central Marin Sanitation Agency
CFR	Code of Federal Regulations
CRS	Community Rating System
DWR	Department of Water Resources
EOC	Emergency Operations Center
ERAF	Excess Educational Revenue Augmentation Fund
ESE	Environmental Safety Element
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FMAP	Flood Mitigation Assistance Planning Grant
HMGP	Hazard Mitigation Grant Program
JPA	Joint Powers Agreement
LHMP	Local Hazard Mitigation Plan
MCFCWCD	Marin County Flood Control and Water Conservation District
MCSTOPP	Marin County Stormwater Pollution and Prevention Program
MCVNL	Marin Center for Volunteer and Nonprofit Leadership
MMWD	Marin Municipal Water District
NRCS	Natural Resources Conservation Service
NFIP	National Flood Insurance Program
OES	Office of Emergency Services
PDM	Pre Disaster Mitigation
RVWP	Ross Valley Watershed Flood Protection and Creek Restoration Program
SFHA	Special Flood Hazard Area
USACE	United States Army Corps of Engineers

APPENDICES

DISASTER COUNCIL ROSTER

Ken Hughes, Fairfax Police Chief	Town of Fairfax	142 Bolinas Rd, Fairfax, CA 94930	453-5330	khughes@fairfaxpd.org
Cynthia Powell Community Service Officer-Fairfax Police Dept.	Town of Fairfax	142 Bolinas Rd, Fairfax, CA 94930	453-5330	cpowell@fairfaxpd.org
Craig Carroll, Captain	Ross Valley Fire Dept	777 San Anselmo Ave. San Anselmo 94960	453-1289 x30	blaze24311@yahoo.com
Jon Marchant	Marchant Chapman Real Estate	63 Live Oak Fairfax, CA 94930	451-1474 388-1899	jon@marchantchapman.com ;
Mary Ann Maggiore, Mayor	Town of Fairfax	79 Willow Ave., Fairfax, CA 94930	460-1106	maggiore@infoasis.com
Michael Rock, Town Manager	Town of Fairfax	142 Bolinas Rd, Fairfax, CA 94930	453-1584	mrock@townoffairfax.org
Maria Baird, Community Resources Coordinator	Town of Fairfax	16 Park Rd. Fairfax, CA 94939	456-5652	mbaird@townoffairfax.org
Dennis Riley, Director of Student Services	Ross Valley School District	110 Shaw Dr., San Anselmo, CA 94960	451-4065 451-4066	driley@marin.k12.ca.us
Gail Wiemann	Fairfax Library	2097 Sir Francis Drake Blvd. Fairfax, CA 94930	453-8092	gweimann@co.marin.ca.us
Bob Wheeler, Disaster Specialist	Marin Red Cross	712 Fifth Ave. San Rafael, CA 94901	328-0809	wheelerro@usa.redcross.org
Roger Meagor, Ross Valley Fire Chief	Ross Valley Fire Dept	777 San Anselmo Ave. San Anselmo 94960	258-4686	r.meagor@rossvalleyfire.org
Bruce Stahley, Emergency Services Coordinator	Marin Co. Office of Emergency Services	3501 Civic Center Dr., Rm. 266, San Rafael, CA 94903	499-6584	bstahley@co.marin.ca.us
Cindy Swift	U.S. Army Corps of Engineers	1455 Market St. San Francisco, CA 94103	503-6515	cindyswift@sbcglobal.net cindy.swift@us.army.mil
Tessa Burns	Red Cross	712 5 th Ave. San Rafael, CA 94901	721-2370 694-9039	tessas@usa.redcross.org

Town of Fairfax

Flood Mitigation Plan Community Workshop

Thursday, July 26th
7:00 - 9:00 p.m.
Fairfax Women's Club
46 Park Road, Fairfax

Participate in
flood prevention
planning for
Fairfax!



Everyone with an interest in flooding solutions in Fairfax is invited to participate in this workshop. The Town of Fairfax is engaging the services of Paula Schulz of Natural Hazards Mitigation to update our flood mitigation plan, funded by a FEMA flood hazard mitigation planning grant received by the Town.

The workshop will be a combination of brief presentations, informal discussion, and an interactive session where participants will fill out a short questionnaire regarding their flooding experiences and have the opportunity to locate and mark their property on a community map. We are interested in obtaining specific information from participants regarding flood impacts and potential solutions to prevent future damage.

Questions regarding the workshop may be directed to Town Manager Linda Kelly at 458-2345.

Town of Fairfax

Community Workshop: Flood Hazard Mitigation Plan



**Thursday, Nov. 29th
7 – 9 p.m.
Fairfax Women’s Club
46 Park Road, Fairfax**

This is the second of two public workshops regarding the update to the Town’s Flood Hazard Mitigation Plan, funded through a FEMA grant. Consultant Paula Schulz of Natural Hazards Mitigation will present the flood damage survey results, the draft flood mitigation plan, the community’s role in implementation of the plan, and the Community Rating System (CRS) for flood insurance. The meeting is open to everyone and public participation in the process is encouraged.

Questions may be directed to Linda Kelly, Town Manager, at 458-2345.

Sorella restaurant photo courtesy of Brenda Lein

Town of Fairfax

Flood Mitigation Planning Project

Community Flood Damage and Action Survey Summary

Based on a total of 9 Workshop Responses & 12 Post-Workshop Responses

1. Have you experienced damage to your property from flooding in the Town of Fairfax?

[10] Yes [11] No (Skip to Question 4 below)

2. How many times have you been flooded?

[4] Once [3] Twice [1] Three or more times

3. What was damaged? Check all that apply, and fill in an estimated cost of damage.

[6] House/Apartment	\$ 295,000
[1] Furniture/Appliances	\$ 3,000
[2] Garage or Shed	\$ 500
[4] Business	\$ 8,000
[4] Erosion of creek frontage	\$ 2,000,000
[2] Landslide/mudslide damage	\$ 0
[2] Vehicle	\$ 6,000
[] Other (write in) retaining wall; mud cleanup; lost floor insulation; driveway; garden	\$ 292,000

4. Whether our not your personal property received flood damage, was your daily life interrupted by flood effects, such as access to public safety or Town services, parks, roads, power outages, business access?

[19] Yes [2] No

5. Have you taken any of the following steps to limit your future flood losses?
Check all that apply.

[3] Purchased flood insurance
[2] Elevated electric box or appliances above flood level
[0] Elevated structure above flood level
[11] Improved drainage around property
[0] Installed permeable paving
[1] Installed floodgates
[3] Placed sandbags around property

- [0] Moved your household to a residence outside of the flood plain
- [6] Other: routed gutters to tank and then to landscape so that water can slowly be absorbed; repairing creek bank; repaired damage to furnace ducting; planted willows to stabilize bank; marked location of drain grate so it can be located when submerged; creek berm repairs.

6. What kinds of incentives would help you put flood mitigation measures in place?
Check all that apply.

- [6] Flood insurance discounts
- [12] Permit fee waivers
- [13] Tax break or rebate
- [10] Low interest rate loan
- [10] Cost sharing
- [7] Incentives to install floodgates, where appropriate
- [7] Other: private dams to minimize peak flow and use stored water for irrigation; incentives to install retention basins, enlarge culverts, improve drainage; expeditious permit process; we should all look to restrict the amount of water entering the creeks; support and cooperation with concerned neighborhood organizations, such as the Ridgeway-Willow Watershed Neighbors; expedite permits for repair work; supply plants to stabilize eroding sides of creek banks.

7. There are many things the community can do to reduce the risk of flooding. Please check the box that best represents how important each activity is to you from the standpoint of protecting yourself, your property and your community from the impacts of future flooding in the Town of Fairfax.

Activities	Very Important	Somewhat Important	Not Important
Access to Preparedness Information	[10]	[10]	[1]
Warning/Evacuation Systems	[12]	[8]	[1]
Stream & Culvert Clearing	[18]	[2]	[1]
Improving Drainage	[17]	[3]	[1]
Providing Sandbags	[5]	[12]	[4]
Protecting Private Property	[8]	[7]	[4]
Protecting Government Buildings	[11]	[8]	[0]
Providing Emergency Services	[15]	[5]	[1]
Protecting Utilities from Damage	[13]	[7]	[0]
Restricting Development in Floodplain	[14]	[6]	[0]
Enhancing Creeks and Streams	[16]	[4]	[0]
Participation in Watershed Planning	[15]	[5]	[1]
Improving Floodplain Mapping	[10]	[8]	[1]
Conducting Hydrologic Studies	[13]	[6]	[1]
Installation of floodgates on private property	[7]	[8]	[2]
Write-in comments:			
Recognition of multiple property owners' interest in culvert/historic creeks	[]	[]	[]

Storm drain mapping	[]	[]	[]
Improved permitting process(county) requiring flood mitigation	[]	[]	[]
Educate the public re: creeks and storm drains	[]	[]	[]
Use Ross Valley Mitigation League for education	[]	[]	[]
Educational funding toward homeowner projects	[1]	[]	[]
Rebates for people who change to permeable Driveways or gutter to landscape	[1]	[]	[]
Control watershed (source) runoff	[1]	[]	[]
Zoning changes to encourage pier foundations in flood zones, allowing water to pass between them, and providing better support for structure in earthquake (flood zone is often alluvial subsidence as well	[1]	[]	[]
Ban new construction along creeks	[1]	[]	[]
Encourage homeowners/businesses in flood zone to elevate structures per FEMA and optionally reduce building permit fees for this specific purpose	[1]	[]	[]
The town should look at long-term mitigation of buying high risk, creekside properties with intent to restore creek habitat or create park land. overtime, the commercial downtown could be eased out of the 100-year floodplain	[1]	[]	[]
Restricting development at all elevations that adds to stormwater runoff until a better drainage system is in place throughout our watershed	[1]	[]	[]

I own (15) or rent (1) my home. I own (3) or rent (3) my place of business in Fairfax.

PROGRAM	Hazard Mitigation Grant Program (HMGP)	Flood Mitigation Assistance (FMA)	Pre-Disaster Mitigation (PDM)	Urban Steams Restoration
Granting Agency	FEMA	FEMA	FEMA	DWR
Eligible applicants	<ul style="list-style-type: none"> ▪ State & local governments ▪ Indian tribes or other tribal organizations ▪ Certain non-profit organizations ▪ Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf. 	<ul style="list-style-type: none"> ▪ Any State agency ▪ Participating NFIP communities ▪ Local organizations ▪ Individuals wishing to participate in FMA should contact their community officials. 	<ul style="list-style-type: none"> ▪ State-level agencies including state institutions ▪ Local governments ▪ Public colleges and universities ▪ Federally-recognized Indian tribal governments ▪ Authorized Indian tribal organizations ▪ Indian tribal colleges and universities. ▪ Private non-profit (PNP) organizations and private colleges and universities are not eligible applicants; however, an eligible, relevant state agency or local government may apply for assistance to benefit the private entity. 	<ul style="list-style-type: none"> ▪ Local public agency and citizen's group (both required)
Hazard Type(s)	Any	Flood	Any	Flood

PROGRAM	Hazard Mitigation Grant Program (HMGP)	Flood Mitigation Assistance (FMA)	Pre-Disaster Mitigation (PDM)	Urban Steams Restoration
Planning Grants Available?	Yes	Yes	Yes	No
Eligible types of project activities (Partial listing only)	<ul style="list-style-type: none"> ▪ Acquisition of hazard-prone property and conversion to open space ▪ Retrofitting existing buildings and facilities ▪ Elevation of flood-prone structures ▪ Vegetative management/ soil stabilization ▪ Infrastructure protection measures ▪ Stormwater management ▪ Minor structural flood control projects ▪ Post-disaster code enforcement activities. 	<ul style="list-style-type: none"> ▪ Acquisition and demolition of NFIP insured hazard prone property and conversion to open space ▪ Elevation of NFIP insured flood prone structures ▪ Relocation of NFIP insured structures to sites not prone to floods ▪ Minor structural flood control projects 	<ul style="list-style-type: none"> ▪ Acquisition of real property for conversion to open space ▪ Relocation of public or private structures ▪ Elevation of existing public or private structures to avoid coastal or riverine flooding ▪ Structural retrofitting and non-structural retrofitting ▪ Hydraulic studies, analyses, engineering studies, and drainage studies for the purpose of project design and feasibility in conjunction with a project. ▪ Protective measures for utilities; water and sanitary sewer systems and/or infrastructure ▪ Storm water management projects (e.g., culverts, retention basins) to reduce or eliminate long-term risk from flood hazards ▪ Localized flood control projects 	<ul style="list-style-type: none"> ▪ Creek cleanups ▪ Eradication of exotic or invasive plants ▪ Revegetation efforts; ▪ Bioengineering bank stabilization projects; ▪ Channel reconfiguration to improve stream geomorphology and aquatic habitat functions; ▪ Acquisition of parcels critical for flood management ▪ Coordination of community involvement in projects.

PROGRAM	Hazard Mitigation Grant Program (HMGP)	Flood Mitigation Assistance (FMA)	Pre-Disaster Mitigation (PDM)	Urban Steams Restoration
Project must conform with State Hazard Mitigation or other Plan.	Yes, Local Hazard Mitigation Plan (LHMP) NFIP participation may be necessary in some cases	Yes, Flood Mitigation Plan (FMP) NFIP participation required. Communities that are suspended or on probation are not eligible.	Yes, Local Hazard Mitigation Plan (LHMP) NFIP participation may be necessary in some cases	No
Federal share of project cost	Maximum 75%	Maximum 75%	75% with special case for small, impoverished communities of up to 90%	State program: requires community matching funds or in-kind (typically 20%)