Flood Mitigation Project Protects Gingerbread Houses

Full Mitigation Best Practice Story

Humboldt County, California

Ferndale, CA – The City of Ferndale is a small dairy community located in Humboldt County's Eel River Valley. Historic Victorian homes line its downtown streets. Francis Creek meanders through the city, attracting ducks and picnickers. This beautiful town has been declared a Federal disaster area seven times since 1980, due to flooding. The peaceful creek has been known to become a raging river in heavy winters, overflowing its banks and damaging homes and businesses.

When it flooded in 1995, Francis Creek caused $1.76 million in building damages and $289,000 in content losses. After the waters receded, it cost an additional $231,800 to clean up the debris. In 1996, the City of Ferndale, through the Governor's Office of Emergency Services (OES), applied to FEMA's Hazard Mitigation Grant Program (HMGP). The City sought a grant for a comprehensive flood mitigation project on a one-mile stretch of Francis Creek. The project called for increasing the creek's size and water flow by cleaning the creek bed of debris, widening the creek in some areas, and restoring its natural path in other areas. It also called for rebuilding 16 bridges where bridge supports unnecessarily restricted water flow.

At one point, the potential for adverse effects to environmentally-sensitive habitats nearly brought an end to the flood mitigation project. Then, OES and the City came up with a solution. They demonstrated that, with a few adjustments to the plan, the single project could serve multiple purposes. Not only would the project prevent future flooding, it would also improve roads, water quality, and protected species habitat. The California Department of Transportation (CA DOT) and the California Department of Water Resources (CA DWR) became involved. Funding for the project included contributions from FEMA/OES HMGP, FEMA/OES for disaster assistance from a previously approved Disaster Survey Report, CA DOT as a cost-share for drainage improvements within the state right-of-way, CA DWR Urban Streams Restoration Grant Program, and City Drainage Funds.

Engineers designed the project to carry a flow of 750 cubic feet per second (cfs). To widen the creek, 5,600 cubic yards of soil and concrete were removed, then 7,500 tons of boulders were added to shore up the banks of the creek. Workers also removed a concrete channel in front of Ferndale High School and restored the creek's natural course there. They replaced non-native vegetation with native vegetation and layered culvert floors with three feet of gravel, which improved the mobility of aquatic life.

Upon completion in October 2002, the $3.75 million project provided protection to 73 homes, 56 businesses and commercial structures, five churches, a fire station, and three schools. It also protected part of the city's infrastructure, including roads and bridges.

Soon after its completion, nature put the flood mitigation project to the test. In two severe storms in December 2002, the flow in Francis Creek was estimated to be about 600 cfs and 1,000 cfs respectively, which exceeded the 1995 event. The city stayed dry through both flood events. The mitigation project proved to be even more successful than anticipated.

The Mayor praised the mitigation project. "We waited for the banks to overflow, but they didn't. I'm grateful to the State. We couldn't have done it without them."

This successful project serves as a model for other communities. The key element was the collaboration of Federal, state, and local governments to achieve common goals. Goals such as educating the community, protecting the environment, providing risk management, and implementing a project to protect the community have all been met and exceeded.

Activity/Project Location

Geographical Area:	**Single County in a State**
FEMA Region:	**Region IX**
State:	**California**
County:	**Humboldt County**
City/Community:	**Ferndale**

Key Activity/Project Information

Sector:	**Public**
Hazard Type:	**Flooding**
Activity/Project Type:	**Flood Control**
Activity/Project Start Date:	**06/2000**
Activity/Project End Date:	**10/2002**
Funding Source:	**Hazard Mitigation Grant Program (HMGP); Local Sources; State sources**
Funding Recipient:	**Local Government**
Funding Recipient Name:	**City of Ferndale**
Application/Project Number:	**9999**

Activity/Project Economic Analysis

Cost:	**$3,750,000.00 (Actual)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**Yes**
Federal Disaster #:	**1046 , 03/12/1995**
Federal Disaster Year:	**1995**
Value Tested By Disaster?	**Yes**
Tested By Federal Disaster #:	**No Federal Disaster specified**
Year First Tested:	**2002**
Repetitive Loss Property?	**Yes**

Reference URLs

Reference URL 1: **http://www.fema.gov/government/grant/hmgp/index.shtm**

Reference URL 2: **http://www.oes.ca.gov**

Main Points

- The City of Ferndale sought an HMGP grant for a comprehensive flood mitigation project on a one-mile stretch of Francis Creek.
- The project called for increasing the creek's size and water flow by cleaning the creek bed of debris, widening the creek in some areas, and restoring its natural path in other areas.
- Funding for the flood mitigation project eventually came from a variety of sources; the key element was the collaboration of Federal, state, and local governments to achieve common goals.

The "Victorian Village" of Ferndale, California.

Francis Creek before mitigation.

Francis Creek during the flood mitigation project.

Francis Creek after the flood mitigation project.

Francis Creek flows harmlessly past Ferndale High School.

The Fern Street Bridge easily accommodates flood stage waters.