

BUYOUTS/RELOCATION/FLOODPROOFING: REGULATORY PROGRAMS AND EXPERIENCE IN OTHER COMMUNITIES

The following provides details on new federal and state programs, including associated funding options for program implementation, potential local funding options, a discussion of the land swap approach, and a description of several local experiences in planning and implementing buyout, relocation, and floodproofing programs.

FEDERAL AND STATE PROGRAMS

There are currently two federal programs and two state programs through which buyouts, relocation or floodproofing may occur. The two federal programs are implemented under the Reigle Community Development and Regulatory Improvement Act and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The Reigle program takes the place of a similar program implemented under Section 1362 of the National Flood Insurance Act. The two current federal programs are distinguished in that the latter program is designed for assistance during federally declared disasters and activities under the former program take place during non-emergency times.

The Washington State Hazard Mitigation Grant Program is the mechanism through which various program elements of the Stafford Act are implemented. The other state program under which buyouts, relocation, or floodproofing may occur is the Flood Control Assistance Account Program (FCAAP).

Reigle Community Development and Regulatory Improvement Act

Title V of the Reigle Community Development and Regulatory Improvement Act of 1994 (Public Law 103-325) is referred to as the National Flood Insurance Reform Act of 1994. One of the major provisions of the Act is the establishment of a program to provide financial assistance to states and communities for planning and implementation of flood mitigation activities. Details on the program are contained under Subtitle D—Mitigation of Flood Risks.

A new National Flood Mitigation Fund is set up through the act to fund flood mitigation planning and implementation activities. Money for this new fund comes from the National Flood Insurance Fund. The total amounts that are to be credited to the new mitigation fund are as follows:

- \$10,000,000 in the fiscal year ending September 30, 1994
- \$15,000,000 in the fiscal year ending September 30, 1995
- \$20,000,000 in the fiscal year ending September 30, 1996
- \$20,000,000 in each fiscal year thereafter.

Repeal of Previous Programs

The first two sections of Subtitle D repeal Sections 1362 and 1306c of the National Flood Insurance Act of 1968, which contained provisions for acquisition of properties located

in flood-risk areas. A one year transition period beginning on the date of enactment of the Reigle Act, September 23, 1994, is provided for final implementation of activities under Sections 1362 and 1306c.

Conditions

The following conditions for participation in the program are described in the Act:

- The definition of "community" is described as a political subdivision that has building code and zoning code jurisdiction over the flood hazard area, and is participating in the flood insurance program.
- To be eligible for funding for activities, the state or community must have a "flood risk mitigation plan" that:
 - Describes the activities to be funded
 - Is consistent with specific criteria contained in section 1361 of the National Flood Insurance Act of 1968 ("Criteria for Land Management and Use")
 - Provides protection to structures which are covered by an existing flood insurance policy
 - Is approved by the Director
 - Includes a comprehensive strategy for mitigation activities for areas affected by the plan
 - Has been adopted by the State or the community following a public hearing.

The Director (FEMA) has 120 days in which to review submitted mitigation plans and notify the State or community that the plan has been approved or disapproved.

- Funding can only be used for activities included in the approved plan. Activities must be technically feasible, cost effective, and cost-beneficial to the National Mitigation Fund. Mitigation activities for repetitive loss structures and structures that have incurred substantial damage will receive higher priority.

Funding

There are different funding limits for planning and implementation activities under the act. These are described below. Both categories of grants are provided on a 75 to 25 percent federal to local cost-share basis.

Planning

- The total amount available for mitigation planning will be \$1,500,000 per year. Single grants to States and communities cannot exceed \$150,000 and \$50,000, respectively. The total amount of grants to any one state and all communities in that state in a fiscal year may not exceed \$300,000.
- Grants for mitigation planning to States or communities cannot be awarded more than once every 5 years and each grant may cover a period of 1 to 3 years

Implementation

- Limits on grants for mitigation activities during any 5-year period may not exceed \$10,000,000 to any State or \$3,300,000 to any community. The sum of the amounts of mitigation grants that can be made during any 5-year period to any one State and all communities in that State is limited to \$20,000,000
- The limits on grants for mitigation activities described above can be waived for any 5-year period during which a major disaster or emergency is declared by the President as a result of flood conditions in the State or community

Eligible Activities

The act lists specific activities that are eligible for funding. They are as follows:

- Demolition or relocation of any structure located on land along the shore of a lake or other body of water that is certified by an appropriate State or local land use authority to be subject to imminent collapse or subsidence as a result of erosion or flooding
- Elevation, relocation, demolition, or floodproofing of structures (including public structures) located in areas having special flood hazards or other areas of flood risk
- Acquisition by States and communities of properties (including public properties) located in areas having special flood hazards or other areas of flood risk and properties substantially damaged by flood, for public use, as the Director determines is consistent with sound land management and use in such area
- Minor physical mitigation efforts that do not duplicate the flood prevention activities of other Federal Agencies and that lessen the frequency and severity of flooding and decrease predicted flood damages, which shall not include major flood control project such as dikes, levees, seawalls, groins, and jetties unless the Director

specifically determines in approving a mitigation plan that such activities are the most cost-effective mitigation activities for the National Flood Mitigation Fund

- Beach nourishment activities
- The provision of technical assistance by States to communities and individuals to conduct eligible mitigation activities
- Other activities that the Director considers appropriate and specifies in regulation
- Other mitigation activities that are not described above that are described in the mitigation plan of a State or community

Section 1362 of the National Flood Insurance Act of 1968

As described above, the Reigle Community Development and Regulatory Improvement Act rescinded Section 1362 of the National Flood Insurance Act. The following discussion is presented for informational purposes.

Section 1362 of the National Flood Insurance Act of 1968 authorized the Secretary of HUD to purchase properties located in flood risk areas from willing sellers. The purchased property was then transferred to state or local governments. To qualify for purchase, properties must have met the following three criteria:

- Been damaged substantially beyond repair by a flood, or damaged by floods on not less than three previous occasions in five years with the cost of repair averaging at least 25 percent of the value of the structure.
- Been covered by flood insurance
- Been located in any flood-risk area, as determined by the Secretary

Section 1362 provided an opportunity for a federal agency to establish a continuing program to purchase properties for the specific purpose of reducing future flood losses, as opposed to purchasing properties as part of an individual project.

Section 1362 also contained provisions for granting of low interest loans (2 percent rate for 10 year term) for the purpose of elevation of structures. Structures must have been located in a regulatory floodway and insured under the flood insurance program. Structures were to be elevated so they would not interfere with the flow of water from the base flood within the regulatory floodway. A total of \$4,500,000 was set aside for these activities.

National Flood Insurance Program - Regulations for Floodplain Management and Flood Hazard Identification: 44 CFR, Part 77 - Acquisition of Flood Damaged Structures

Part 77 contains further procedural details relating to the broad policy established under Section 1362. While these provisions may be revised following completion of guidelines for planning and implementation activities funded under the new National Flood Mitigation Fund, they are presented here for informational purposes.

Part 77 modifies the 3-part criteria for purchase of real property under Section 1362 by adding two additional criteria as follows:

- A state or local community must enter into an agreement authorized by ordinance or legally binding resolution to take title to and manage the property in a manner consistent with sound land management use as determined by the Administrator
- The community must agree to remove without cost to FEMA, by demolition, relocation, donation, or sale any damaged structures to which the community accepts title from FEMA. This criteria includes the possibility that FEMA may assume a part or all of the cost of the removal

The following series of steps for acquisition and disposition of property are presented within the regulations:

- Agreement is made to sell property and is completely voluntary on the part of the property owner
- Relocation assistance is not available to property owners who sell their property under Section 1362
- The property is appraised based on the *Uniform Appraisal Standards for Federal Land Acquisitions* published by the Interagency Land Acquisition Conference, GPO (1973). Appraisals are made based on the adjusted (for time), pre-damage fair market value of the structure and land. Compensation also includes flood insurance claim payments that resulted from the most recent flood if the repairs have not yet been made.
- FEMA purchases property that meets the criteria described above
- The title is subject to specific restrictive covenants, conditions, and agreements which will run with the land and be binding on subsequent successors, grantees, or assigns. Specific criteria from which deed restrictions will be developed may include:
 - The land must be dedicated in perpetuity for open space purposes

- The community shall manage the land for its dedicated purposes
- The community shall not, without the prior approval of the Administrator, erect or permit to be erected any structures or other improvements on the land unless the structures are, except for restrooms, open on all sides and functionally related to a designated open space use
- The community shall not permit any use which will create a threat to human life from flooding
- The State or local community joins in execution of and takes title to and manages the property as described above
- The property is transferred subject to all relevant and applicable local laws and regulations
- The community agrees to remove damaged structures as described above
- The rights to enforce the restrictive covenants are assigned to the Administrator, with a declaration that any future violations may result in the reversion of title to FEMA

Allowable open space uses of the property are listed in the regulation. They include the following:

- Parks for outdoor recreational activities
- Nature reserves
- Cultivation
- Grazing
- Camping (except where adequate warning time is not available to allow evacuation)
- Temporary storage in the open of wheeled vehicles which are easily movable (except mobile homes)
- Unimproved parking lots
- Buffer zones
- Open space areas that are part of Planned Unit Developments (PUDs)

Structures that are functionally related to these uses are also listed. They are as follows:

- Open-sided picnic and camping facilities
- Kiosks and refreshment stands
- Non-habitable, elevated, or floodproofed service structures associated with a marina

Any such structures are required to be built in accordance with the deed restrictions and floodproofed or elevated to withstand the effects of the 500-year flood.

Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288)

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (The Stafford Act) provides assistance following Presidential declarations of major disasters. Title IV presents details on major disaster assistance programs, including provisions for property acquisition and relocation assistance. Cost sharing is available for up to 75 percent of the cost of any hazard mitigation measures which: "the President has determined are cost-effective and which substantially reduce the risk of future damage, hardship, loss, or suffering in any area affected by a major disaster". However, the total amount of mitigation funding under any disaster declaration cannot exceed 15 percent of the total grant funds provided for the disaster.

The specific terms and conditions used to determine if an acquisition or relocation project is eligible to receive federal funding under the Stafford Act is as follows:

- Acquisition and relocation projects funded under this act must be "cost-effective" and "substantially reduce the risk of future damage, hardship, loss or suffering in any area affected by a major disaster"
- Acquisition and relocation projects and all other mitigation measures must be identified based on an evaluation of natural hazards.
- The applicant (the County or the State) must complete an agreement stating that:
 - The property will be dedicated and maintained in perpetuity for a use that is compatible with open space, recreational, or wetlands management practices
 - The only new structures that will be erected on the property are: 1) public facilities that are open on all sides and functionally related to a designated open space, 2) rest rooms, or 3) a structure that is approved by the Director in writing before the start of construction
 - No application will be made for additional disaster assistance for projects relating to the property and no federal funding will be granted for such projects

State Hazard Mitigation Grant Program

The Washington State Department of Community, Trade, and Economic Development coordinates state disaster mitigation, preparedness, response and recovery activities. Under this mandate, the agency administers the State Hazard Mitigation Grant Program (also called the "404 program" after the section of the Stafford Act dealing with Hazard

Mitigation), which is authorized and partially funded under the Stafford Act. State Hazard Mitigation Grants are made to local governments on a cost share basis, with the federal, state, and local percentage matches set at 75, 12.5 and 12.5 percent, respectively. Federal funding for this program is contingent on a Presidential Disaster Declaration. State and federal money distributed under this program can only be used for acquisition of property and demolition of structures. Funding can not be used for elevation of structures or relocation of residents.

Funding for the program since 1989 has totaled approximately \$9 million, with approximately \$6 million coming from the federal government and \$3 million from state sources. Even with this apparently high level of mitigation funding, total requests by applicants for State Hazard Mitigation Grants have consistently been greater than monies available. Therefore, the State has established a competitive procedure for funding. Applications are reviewed by a panel of state and local officials and scored based on how well they meet the specific terms and conditions required by the Stafford Act (see previous discussion of Stafford Act). This process is administered by the Department of Community Development. Selected applications are then sent to FEMA for approval.

Flood Control Assistance Account Program

Funding for flood control maintenance projects and preparation of CFHMP's are available through FCAAP. It may be possible to receive funding for acquisition, relocation, or floodproofing activities as a type of "maintenance" project. Distribution of FCAAP grant money depends on the amount appropriated by the State Legislature each biennium and is based on the eligibility of the applicant and the proposed project. Conditions for funding include the following:

- Grants are limited to 50 percent of the total cost for non-emergency projects
- The non-emergency FCAAP contribution is limited to \$500,000 per county.
- Emergency funds of up to \$150,000 per county per biennium are available on a first come/first served basis; the State will fund up to 80 percent of the cost of emergency projects
- Unused emergency funds (\$500,000 total emergency fund) can be disbursed on a discretionary basis by Ecology
- The state can fund 75 percent of the cost for comprehensive flood hazard management plans

LOCAL FUNDING OPTIONS

A brief listing of local approaches for partial or complete funding of buyout, relocation, or floodproofing projects is as follows:

- Flood Control Zone Districts - Flood Control Zone Districts, such as the one that exists for the Skokomish River have the authority to use several different funding mechanisms in order to achieve locally identified goals. It is conceivable that funds from the Flood Control Zone District can be used to meet a portion or all of the costs of buyout, relocation, or floodproofing programs.
- River Improvement Funds - Provisions for River Improvement Funds are included in RCW 86.12. Originally, the purpose of the fund was to finance drainage activities related to flood control, but it can and is being used in some counties to fund activities related to flood or stormwater control as specified in RCW 86.12.020.
- Local Improvement Districts - Local Improvement Districts (LIDs) allow the County to issue bonds for the cost of improvements and to recover the cost through assessments made on "specially benefiting" property or properties. Special benefit is defined by the increased property value that results from the improvements. This approach is typically used to fund development of local infrastructure.
- County Revenues - It may be possible to use a number of County funding sources to finance all or part of a buyout, relocation, or floodproofing program, including county general funds.

LAND SWAPS

The land swap approach involves a transfer of government held land to private property owners who are willing to relocate from their flood prone property. Once acquired by the government, any structures on the property are demolished and the property is used for open space purposes, thereby eliminating the flood hazard. The land swap approach is one option being considered for acquisition of floodprone properties in the town of Hamilton in Skagit County.

Hamilton is located just north of the Skagit River approximately 10 miles east of the town of Sedro Woolley. The State Department of Community, Trade, and Economic Development and FEMA have been working with citizens of the town to complete a program of acquisition and relocation, possibly involving a land swap approach. Several attempts were made by the governmental agencies involved to identify and purchase properties to which residents could be relocated, however prices for these properties increased beyond the available funding after they were identified. The current focus for the town is to relocate the fire hall and a pump station to a new town center, outside of the flood prone area.

LOCAL EXPERIENCES

Three previously completed Flood Hazard/Floodplain Management Plans which contain provisions for buyout, relocation, or floodproofing and descriptions of historical experiences in these areas were reviewed in order to gain an understanding of how

other communities have planned for and implemented these activities. Summaries of relevant sections of the following three plans are presented below:

- King County Flood Hazard Reduction Plan
- City of Snoqualmie Floodplain Management Plan and Repetitive Loss Plan
- Lewis County Comprehensive Flood Hazard Management Plan.

King County Flood Hazard Reduction Plan

Background

The King County Flood Hazard Reduction Plan was completed in January 1993 and presents a program of flood hazard management actions for six river basins within the county. They are as follows:

- Skykomish River Basin
- Snoqualmie River Basin
- Sammamish River Basin
- Cedar River Basin
- Green River Basin
- White River Basin.

The plan was developed to prevent or mitigate damages from future floods that may be similar or more extreme in magnitude than previous floods. The Thanksgiving 1990 flood alone caused more than \$15 million in damage in King County. The plan addresses the following topics:

- Policies to guide floodplain land use and flood control activities in King County
- Program and project recommendations, including capital improvement projects, maintenance, relocation, and elevation of homes, and flood warning improvements and river planning activities
- Implementation priorities for program and project recommendations
- An analysis of major financing alternatives and issues.

Relocation and elevation are described as new activities that have never before been funded in King County. The following are positive characteristics of these approaches that are described in the plan:

- Cost effective and permanent solution to flooding, particularly in low-density areas
- None of the ongoing repair costs associated with structural CIP's
- Reduces public expenditures for flood insurance claim payments
- Can increase flood storage and conveyance capacity (relocation)
- Creates open space areas along the major rivers (relocation)
- Provides added benefits of public river access and preservation of wildlife habitat (relocation)
- Reduces public expenditures for repair of existing flood- and erosion-control facilities (relocation)
- Costs less than a new levee or levee improvement (elevation)
- Does not create a new maintenance commitment (elevation)
- Makes citizens eligible for lower flood insurance rates (elevation).

Relocation can involve either demolition of a structure and relocation of its residents, or the actual relocation of the structure. King County would acquire the land previously occupied by the structure in both cases. The plan cites the high costs of relocating a home and its residents as the reason why relocation should be recommended only in very high hazard areas. These areas are subject to deep, high velocity flows or undercutting due to channel migration.

Elevation involves raising the finished floor of a structure above the predicted level of the 100-year flood, thus reducing the potential for flood damages. Elevation is described as being appropriate in areas where homes are subjected to low velocity floodwaters. Elevation is inappropriate in areas subject to high velocity flows (e.g. the FEMA floodway) because the home would still be at risk of serious damage or collapse. Elevation is also inappropriate in areas where a home is threatened by bank erosion.

The following discussion focuses on policies and recommendations relating to relocation and elevation projects.

Policies

The following policies relating to relocation and acquisition are presented in the plan:

Voluntary Acquisition Versus Condemnation

County acquisition of threatened buildings should be voluntary on the part of the property owner except under very limited circumstances. These circumstances are as follows:

- Federal, state, and/or local regulations prohibit reconstruction of the building
- The property in question is causing significant flood damage to other properties
- A property owner refuses to sell a portion of an area in which the majority of property owners have agreed to sell to the county
- A property owner refuses to sell an area needed to complete an approved capital improvement project.

Strong points are made in the plan regarding property owners rights. The plan indicates that no projects will be implemented without extensive discussion between the County and the affected homeowners. Site-specific recommendations presented in the plan are described as preliminary contingent on the response of affected property owners. Homeowners are given the final say as to whether or not their home is relocated or purchased by the County in nearly all situations.

Using Land Created by Relocation or Acquisition

Vacant land is created when structures are relocated or acquired and demolished by the County. This land will have value as open space, habitat, parks, or agricultural land. Open land created by the relocation or acquisition of structures should become either a County easement (if the structure is relocated to another site on the same lot) or be owned and managed by King County as open space, riparian corridor, agriculture, or a recreation area.

Recommendations

A total of 44 potential relocation projects are identified in the plan, which would involve relocation of 347 structures at an estimated cost of \$49.4 million. A total of eighteen potential elevation projects are identified in the project at an estimated cost of \$4 million. The total costs for relocation and elevation are \$53.5 million, or approximately 17 percent of the total cost of all recommended capital projects.

Costs for relocation projects include the following:

- Fair market value of the structures and properties (Unit costs of \$180,000 were assumed for house relocation and \$24,000 for mobile home relocation)
- Appraisals and title searches
- Developing and managing contracts for demolition or relocation of structures
- Preparation and tracking of permits
- Working with residents to clarify the project proposal

- Coordinating with other affected agencies.

For the purposes of estimating relocation costs, it was assumed that the structure would be acquired and demolished, rather than moved.

Costs for elevation projects include the following:

- Average of \$24,000 for elevation of a fixed structure (Actual costs will vary depending on the size and design of each structure)
- Managing construction contracts
- Obtaining necessary permits
- Working with property owners.

City of Snoqualmie Floodplain Management Plan and Repetitive Loss Plan

The City of Snoqualmie faces flood hazards from the Snoqualmie River. The river is constricted as it flows over Snoqualmie Falls. During flood events, backwater from the falls spreads over the floodplain upstream of the falls, inundating most of the developed portion of the City. Damages to property during the 1990 flood were estimated at \$15 million.

The City developed a Floodplain Management Plan and Repetitive Loss Plan in order to minimize future damages in the floodplain. The Plan was adopted in September 1993. Properties that have repetitive losses are defined as those having two or more claims of at least \$1,000 that have been paid by the National Flood Insurance Program since 1978. Twenty one properties were identified by the City as repetitive losses in 1993.

The City has participated in the Community Rating System (CRS) since 1992. The CRS is a program developed by FEMA that provides reductions in flood insurance premiums when communities complete activities that will decrease flood hazards. Several of the activities that have been completed by the City are documented in the Floodplain Management Plan and Repetitive Loss Plan and annual progress reports that are submitted under the program. Activities that have been completed related to buyout, relocation, and floodproofing are as follows:

- Five properties were purchased and their residences removed under the FEMA 1362 program that was recently discontinued
- At least twenty eight residences have been elevated above the 100-year flood elevation
- The high school has been floodproofed
- The City maintains certificates of elevation for all post-FIRM structures and maintains files of Corps of Engineers surveys of building elevations originally prepared in 1981

- The City mails educational materials to residents twice a year. Flood protection measures that residents can complete are described in the materials
- The City requires that structures be built on engineered fill or pile foundations with "flow through" features. The City also implements floodplain regulations which do not allow a net import of fill. Any import of needed structural fill must be compensated for by an equal amount brought out of the floodplain. The City maintains a log of fill activity in the floodplain.
- The City assists property owners who wish to elevate or floodproof their home or business
- The City plans to require houses that are being substantially improved to be elevated at the same time
- The City plans to revise local regulations so that new structures will be required to be built a minimum of one foot above the base flood elevation

Lewis County Comprehensive Flood Hazard Management Plan

The Lewis County Comprehensive Flood Hazard Management Plan, completed in 1994, addresses flood issues related to the Chehalis, Nisqually, and Cowlitz Rivers. The major focus of the plan is on the Chehalis/Centralia region where flooding has historically caused millions of dollars in damages. During the 1990 flood, residential damages in Centralia and Chehalis totaled \$4.3 million. Approximately 905 residential dwellings were damaged during the flood.

Corps of Engineers Activities

The Lewis County CFHMP includes a summary of historical and current flood hazard reduction efforts. Since 1935, the COE and other agencies proposed numerous structural flood control measures to prevent flooding in the Chehalis River valley, including dam construction and modification, channel alterations, levees and pump stations. None of the major structural flood control measures have ever been approved or constructed due to a lack of funding, environmental considerations, and regulatory requirements.

The Corps completed a Flood Damage Reduction Interim Feasibility Report and Environmental Impact Statement for the Centralia/Chehalis area in 1982. Evacuation and relocation of residential and commercial structures was determined by the Corps not to be a viable alternative for consideration. Evacuation and relocation is defined as the removal of structures from the floodplain and relocation to a flood free site. Approximately 2,390 residences and 315 commercial, industrial, or public structures are located in the 100-year floodplain in Centralia. The plan indicates that economical and political reasons related to this large investment in the floodplain area prohibits

consideration of evacuation and relocation for the entire flood plain area. The relocation of smaller areas was also determined to be publicly unacceptable.

The Corps of Engineers also evaluated floodproofing as an alternative in their 1982 report. The cost of floodproofing all 1,300 residential and 130 commercial or industrial structures in Centralia was estimated to be \$22,600,000 in 1976 dollars. This cost included raising residential buildings so that all first floor levels were above the 100-year flood, and modification of commercial and industrial buildings so that openings below the flood-water surface would be watertight. While flood damages to residential and commercial structures would be largely eliminated, other adverse impacts from flooding would continue. This would include damages to public streets and utilities, cutoff of road and road access, disruption of police, fire, and ambulance service, and deposition of silt and debris. The COE determined that this alternative was not economically justified.

CFHMP Recommendations

Due to the history of inaction in implementing structural flood hazard management measures and based on input from the community, the CFHMP was developed to focus on nonstructural flood hazard management measures. The following is a summary of the nonstructural measures recommended in the plan:

- Improvement of flood warning and emergency response procedures
- Flood-proofing of individual structures
- Completion of flood audits for residential and commercial buildings in the floodplain
- Modification of the flood damage prevention ordinances of Centralia, Chehalis, and Lewis County to achieve consistency in the valley
- Use of the best available historical flood records to assess flood hazards
- Modification of the Flood Insurance Rate Maps so that they represent flood hazard areas based on the actual flood inundation history.

Flood proofing approaches are described in detail in the plan. The plan categorizes flood-proofing approaches as permanent, contingent, and emergency. Permanent flood proofing is always in place and requires no action if flooding occurs. Floodwalls, levees, closures and sealants, elevation, and relocation are included in this category. Contingent floodproofing requires installation prior to flood occurrence and includes flood shields, watertight doors, and movable floodwalls. Emergency floodproofing techniques are improvised when flooding occurs. Sandbag dikes and earth filled retaining walls are included in this category.

The plan recommends establishing elevation and relocation as the preferred flood-proofing method for the Centralia/Chehalis area. Relocation or elevation projects are

recognized as having high short-term costs, however they provide the lowest cost alternative in the very high hazard areas.

The COE completed a flood audit for approximately 200 property owners during the period in which the CFHMP was being prepared. Fifteen flood-prone areas within the cities of Centralia and Chehalis were identified based on historical FEMA flood damage reports. Residents in these areas were solicited to participate in the flood audit program. Approximately 200 property owners responded and participated in the program. That represents a 10 percent participation rate in the program.