

# Chehalis River Basin Repetitive Flood Loss Strategy

Repetitive Loss Areas Summary							
Jurisdiction	In CRS?	NFIP Data			Field Findings		
		FEMA List	Unmitigated	SRLs	Areas	Areas	Buildings
Aberdeen	No	9	9		6	4	>500
Bucoda	No	2	2		2	1	±175
Centralia	Yes	64	31	6	8	8	760
Chehalis	Yes	65	47	9	8	8	130



*Flood Safety  
Information*



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# Chehalis River Basin

## Repetitive Flood Loss Strategy

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## Executive Summary

Repeated flooding of the same areas was identified as a priority by the Chehalis River Basin Flood Authority. Developing a strategy for repetitive loss mitigation was one of the main assignments of French & Associates’ floodplain management assessment. Work on the strategy started with flood insurance data on repetitive loss properties.

**Extent of the Problem:** The flood insurance lists have a total of 249 repetitive loss properties in Basin communities. The table to the right identifies which community they are listed under (“NFIP Data”). The properties on the FEMA lists are not the entire problem. They are indicators of broad problem areas, as noted in the field findings. Accordingly, the project team plotted and visited all the sites on the lists to identify neighboring properties that have the same exposure to repetitive flooding (“Field Findings”).

Repetitive Loss Areas Summary							
Jurisdiction	In CRS?	NFIP Data				Field Findings	
		FEMA List	Unmitigated	SRLs	Areas	Areas	Buildings
Aberdeen	No	9	9		6	4	>500
Bucoda	No	2	2		2	1	±175
Centralia	Yes	64	31	6	8	8	760
Chehalis	Yes	65	47	9	8	8	130
Cosmopolis	No	0	0		0	0	
Grays Harbor County	No	30	28	1	14	15	100
Lewis County	Yes	54	27	3	15	15	165
Montesano	No	2	2		2	0	
Napavine	No	0	0		0	0	
Oakville	No	2	2		2	1	16
Pe Ell	No	0	0		0	0	
Thurston County	Yes	21	3		2	3	6
		249	151	19	59	55	>1,850

There are 55 different known repetitive flood loss areas in the Chehalis Basin. These areas are spread widely across the basin, in both populated and rural areas. The 55 areas have approximately 1,850 buildings in them, mostly single family homes. Most buildings are in good or fair condition and are appropriate to be elevated above flood levels.

**Loss Reduction Tools:** Four major ways to mitigate the impact of repetitive flooding on properties are reviewed: regulations, flood control, retrofitting, and public information

**Recommendations:**

- All four loss reduction tools should be used.
- Communities should use the Community Rating System for guidance and to gain support for projects that use the tools recommended by this report.
- Communities should prepare a repetitive loss area analysis for each area.
- Loss reduction projects should involve the property owners as much as possible.
- Community staff should be prepared for mitigation opportunities that may arise when a building is to be improved and after a building has been damaged.

The Flood Authority has \$1.5 million for flood loss mitigation. The following criteria are recommended for use of these funds.

- \$1,400,000 should be budgeted for funding retrofitting projects. The report lists recommended criteria to ensure the greatest return for these funds.
- The remaining \$100,000 should be budgeted to fund technical assistance to communities.

## Introduction

The Chehalis River Basin has experienced severe flooding in 1990, 1996, 2007, and 2009. The 2007 flood elicited a response by local and state governments that resulted in the formation of the Chehalis River Basin Flood Authority, which was charged with developing flood hazard mitigation measures throughout the Basin.

The Flood Authority has undertaken a broad approach to flood hazard mitigation. Examples of its projects include evaluating flood control alternatives, modeling flood flows to evaluate the impact of alternative measures, establishing an early flood warning program, and promoting and supporting livestock evacuation areas (“critter pads”).

In 2014, the Flood Authority initiated an analysis of the repetitive aspect of flooding in the area. The primary reason for this is to reduce the impact of chronic flooding. Another reason for this attention is the priority that Federal Emergency Management Agency programs put on mitigating losses from repetitive flooding. FEMA grants favor mitigating repetitive loss properties and addressing them is a prerequisite for participation in the Community Rating System (CRS).

**This report:** French & Associates was tasked to assess the repetitive flooding problem and draft a repetitive loss strategy. This report assesses the extent of repetitive flooding and then reviews the alternative tools that can mitigate the impact of repetitive flooding on property in the following chapters. At the end are recommendations for the Flood Authority and the Basin communities.

Note that some data are only available from the National Flood Insurance Program (NFIP) in aggregate form by community. However, in most cases, the data provided here, including all the field findings, are only for those portions of the three counties that are in the Chehalis River Basin.

## Extent of the Problem

### Repetitive Loss Data

This task assumed that there would be two sources of information on the location and extent of flooding resulting in repetitive losses: community knowledge and flood insurance records. Each of the twelve participating Basin communities were visited in June 2014 for a review of their floodplain management programs. At those visits, the insurance records were discussed and staff were asked if there were additional problem areas. No additional areas were identified. Accordingly, the initial repetitive loss data is based on the flood insurance records.

### Flood Insurance Data

Flood insurance is provided under FEMA's National Flood Insurance Program (NFIP). The NFIP is continually faced with the task of paying claims while trying to keep the price of flood insurance at an affordable level. It has a particular problem with repetitive flood loss properties. Almost \$9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments since 1978.

Currently, only 1.3% of all the policies in the NFIP cover repetitive loss properties, but FEMA's actuaries state that those properties are expected to account for 15% to 20% of future losses. NFIP actuaries have reported that repetitive loss is the single most important factor that affects the stability of the National Flood Insurance Fund. This is the reason why mitigating repeatedly flooded properties is a priority for FEMA.

**Definitions:** The NFIP defines a repetitive loss property as one with two or more flood insurance claims of more than \$1,000 having been paid within any 10-year period since 1978 (e.g., two claims during the periods 1978–1987, 1979–1988, etc.). There are over 150,000 repetitive loss properties in the country.

To focus resources on the worst cases, the category of "Severe Repetitive Loss" properties was created in the Flood Insurance Reform Act of 2004. Severe Repetitive Loss (SRL) properties are those 1–4 family properties that have had four or more claims of more than \$5,000 or two to three claims that cumulatively exceed the building's value. SRLs have special flood insurance policies written directly by FEMA instead of by an insurance company.

**NFIP data:** The eleven Basin communities in the NFIP (all but Napavine) submitted a request to FEMA for lists of the flood insurance policies in force in the community, the claims history, and the officially designated repetitive loss properties. The effective date of the NFIP data for the communities ran from February 28 to May 31, 2014. Since there were no floods between January 2014 and when the field work was conducted in June, the numbers are considered current for the purposes of this report. It should be noted that the NFIP data apply to all communities in the NFIP, including those not in the Community Rating System.

**The Privacy Act:** The FEMA lists contain information about private property that is protected under the Privacy Act of 1974. The Privacy Act means:

Personally identifiable Information such as the names or addresses of specific properties, whether they are covered by flood insurance or not, whether they have received flood insurance claims, or the amounts of such claims may not be released outside of local government agencies or to the public or used for solicitation or other purposes. General or aggregated information, such as total claims paid for a community or an area or data not connected to a particular property may be made public. – 2013 CRS Coordinator’s Manual, page 500-9.

The communities shared their lists with French & Associates as their representative. The lists are secured and not included with this report. This report only provides aggregate data, as required by the Privacy Act.

**Plotting NFIP data:** Flood insurance data come from the policies written by many different insurance agents. Most of the information on a policy is not updated when the policies are renewed. As a result, policy data often have one or more of the following problems:

- The repetitive claims can be from as far back as the early 1980s. In some communities, only half of the repetitive loss properties are still insured. It is possible that since the last claim, the building has been elevated or even removed and the property is no longer subject to repetitive damage.
- The address of the insured property may not be clear. Some are rural route numbers and some have been for the address of the policy holder, not the address of the insured building. During French & Associates’ field work, a few addresses could not be found, so staff recorded data for nearby properties that appeared to have repetitive flooding problems.
- Policies are tracked by the NFIP community ID number. Each city and county is a separate NFIP community. If a property in the unincorporated area of a county is annexed into a city, the NFIP community ID should change, but often is not. One reason for this is that the Flood Insurance Rate Maps are not updated for many years.
- Some community IDs are based on the address of the property. A property in the unincorporated area of a county with a city’s name and zip code in its address may be incorrectly listed under the city’s community ID.

When policy data were plotted for the communities in Grays Harbor County, it was found that many policies with a city’s community ID were for addresses that have the name of the city in them, but which were located outside the corporate limits. Similarly, there were many policies recorded under the County’s community ID that were within city limits. This is not unique to the Chehalis River Basin. For example, Pierce County did an intensive review of its flood insurance policies and found a 40% error rate in community ID numbers.

The worst case of this found by French & Associates is Oakville. The NFIP records assign two repetitive loss areas to Oakville when in fact they are both well outside the city limits. In fact, one is in Thurston County. Conversely, a repetitive flood loss area that was in Grays Harbor County was annexed into the City of Oakville before the floods of 2007 and 2009. This repetitive loss area is assigned to the County, in part because the Flood Insurance Rate Maps still show it outside the City.

## Repetitive Flood Loss Properties

For the purposes of this analysis, there are four types of repetitive flood loss properties:

1. FEMA list: There are 249 properties on FEMA's repetitive loss list in the 12 Basin cities and counties. These are *all* the properties that have received two flood insurance claim payments of \$1,000 or more over any ten year period since 1978, including those located in the three counties, but outside the Basin.
2. Unmitigated properties on FEMA's list. Over 50 of the properties on the FEMA list have been acquired, elevated, or otherwise protected from repetitive flooding. Others in the unincorporated counties are not in the Chehalis River Basin. The remaining unmitigated properties in the Chehalis River Basin still face a repetitive flooding problem.
3. SRL: A FEMA severe repetitive loss (SRL) property. These are unmitigated repetitive loss properties on the FEMA list that have had greater damage and have been put in this special category. There are 19 SRLs in the Chehalis River Basin in four of the communities (see table, page 6).
4. Buildings in a repetitive loss area: This project identified repetitive loss areas that include unmitigated properties *and* neighboring properties that have the same exposure to repetitive flooding. Most of these buildings do not have the history of NFIP claim payments. This may be because a property was not insured, was not insured during more than one flood, or the policies and addresses changed, so FEMA's tracking system does not recognize that the same building had repetitive claims.

FEMA considers similarly situated neighboring properties as "repetitive losses in waiting." From a community's perspective, a local government does not differentiate between insured and uninsured citizens and businesses.

For the purposes of this report, all but the mitigated properties on FEMA's list need to be addressed. In other words, attention should be given to all buildings in the repetitive loss areas, those on FEMA's list and those that are not. French & Associates concluded that there are more than 1,850 such buildings facing repetitive flooding in the Chehalis River Basin, as shown in the table on Page 6.

## CRS Repetitive Loss Requirements

The Community Rating System is a FEMA program that recognizes floodplain management activities that are above and beyond the NFIP's minimum requirements and that work toward the program's goals. The recognition comes in the form of reduced flood insurance premiums for policy holders in the CRS community. There is a separate report about the CRS in the Basin.

Currently, four Basin communities are in the CRS – Centralia, Chehalis, Lewis County, and Thurston County. Together, these communities are saving their residents \$450,000 each year in reduced flood insurance premiums. One of the recommendations of the floodplain management review recently conducted by French & Associates for the Flood Authority is that every community should investigate the costs and benefits of joining the Community Rating System.

Because FEMA is so concerned about repetitive losses, there are special prerequisites for communities that have repetitive loss properties who want to be in the CRS. These requirements guided French & Associates' efforts, in part to facilitate participation by those communities that have not yet joined.

Here are the requirements:

1. A community with one or more repetitive loss properties listed under its NFIP community ID number must review the list. If there are errors or out of date information, it must be reported to FEMA. Errors include the kind of issues explained under "Plotting NFIP data" on page 3. Updates include reporting if the building has been mitigated since the last claim.
2. A community's repetitive loss category is determined by the number of unmitigated properties on its updated and corrected list. There are three categories:
  - Category A: A community that has no repetitive loss properties or whose repetitive loss properties have all been mitigated. A Category A community has no special requirements except to submit information to update its repetitive loss list, as needed. The Basin's Category A communities are Napavine (no flood insurance policies), Cosmopolis, and Pe Ell. Montesano is listed as having two repetitive loss properties, but once it documents to FEMA that they are actually outside the city limits, it will be listed as a Category A.
  - Category B: A community with at least one, but fewer than 10, unmitigated repetitive loss properties. Category B communities include Aberdeen, Bucoda, and Oakville.
  - Category C: A community with 10 or more unmitigated repetitive loss properties. Centralia, Chehalis, and the three counties are Category C communities.
3. Category B and C communities have the following tasks:
  - a. Prepare a map of the repetitive loss area(s)
  - b. Review and describe the repetitive loss problem,
  - c. List the addresses of all properties with insurable buildings in those areas, and
  - d. Undertake an annual outreach project to those addresses.
4. In addition to the above, a Category C community must prepare a floodplain management plan or area analyses for its repetitive loss area(s). The plan or analyses would review alternative mitigation measures for the area(s) and identify feasible mitigation activities.

The work that went into this report can help the Category B and C communities meet these CRS prerequisites. Centralia, Chehalis, and Lewis and Thurston Counties have already met the prerequisites, but this report can assist them with their required five-year plan updates.

## Repetitive Loss Areas

### NFIP Data

The table below summarizes the original NFIP repetitive loss property data and the findings of French & Associates' field work. Maps showing the locations of these areas are in Appendix 1.

Repetitive Loss Areas Summary							
Jurisdiction	In CRS?	NFIP Data				Field Findings	
		FEMA List	Unmitigated	SRLs	Areas	Areas	Buildings
Aberdeen	No	9	9		6	4	>500
Bucoda	No	2	2		2	1	±175
Centralia	Yes	64	31	6	8	8	760
Chehalis	Yes	65	47	9	8	8	130
Cosmopolis	No	0	0		0	0	
Grays Harbor County	No	30	28	1	14	15	100
Lewis County	Yes	54	27	3	15	15	165
Montesano	No	2	2		2	0	
Napavine	No	0	0		0	0	
Oakville	No	2	2		2	1	16
Pe Ell	No	0	0		0	0	
Thurston County	Yes	21	3		2	3	6
		249	151	19	59	55	>1,850

Some notes on the table:

- The NFIP data apply to all communities in the NFIP, including those not in the CRS.
- The “FEMA list” numbers are based on the NFIP community ID number for each policy. See the discussion under “Plotting NFIP data” on page 3 for some precautions on depending on these numbers.
- The numbers in the “Unmitigated” column do not include mitigated repetitive loss properties on the FEMA list or policies outside of the Chehalis Basin portion of the counties. Thurston County has a total of 15 unmitigated repetitive loss properties, making it a Category C community.
- “SRLs” are severe repetitive loss properties, which are explained on page 4. These properties are also counted in the “Unmitigated” column.
- The “Field Findings” are based on the field work conducted by French & Associates.
- The “Buildings” column includes all properties in the areas and does not differentiate between insured and uninsured properties or mitigated or unmitigated properties.
- “FEMA List” data for the City of Chehalis are current, but the City’s repetitive loss areas were delineated in 2006 and do not include claims from the 2007 and 2009 floods.

## Field Data

Each of the 59 “FEMA list” areas were visited and on-site data were collected, such as the number, types, and condition of the buildings. New areas were designated in some cases. Several areas were transferred to the actual community they are in, not the NFIP community ID area.

Based on the NFIP policies’ community IDs, there would be 59 repetitive loss areas in the Basin. However, the following were combined:

- Two areas in Aberdeen were combined and a 90 block area of the City between Division Street and the western city limits is considered one area subject to similar flooding. Historic claims were spread throughout this area.
- Two areas in Bucoda were combined for the same reason.
- Two areas in Grays Harbor County included properties listed under Aberdeen’s and Montesano’s community IDs. These four areas were combined into two areas, both in Grays Harbor County.

The areas in Lewis County, Centralia, and Chehalis were not changed as those communities have spent more time than French & Associates plotting and updating their lists, mapping their areas, and implementing programs based on their designated areas. A check of the recently received FEMA list showed only one new property on any of the three communities’ lists since the 2009 flood. However, the data provided by Chehalis have not been updated since 2006 and will need to be in order for the City to maintain eligibility in the CRS.

The 55 newly designated areas are listed in the table on the next two pages. Maps showing the general location of these areas are in Appendix 1.

**Notes on the data:** The numbers of buildings in two of the areas are estimated. Aberdeen 1 covers a 90 block area between the western city limits and Division Street. This includes the entire Special Flood Hazard Area (SFHA) mapped by FEMA. While Bucoda has two repetitive loss properties in different parts of the Town, as with Aberdeen 1, historic claims were plotted throughout the floodplain and the field team’s finding is that the repetitive loss area is the Town’s SFHA.

An additional attribute collected in the field is not displayed in the table. The condition of the buildings in the 55 areas is not listed by area, but is summarized below. Building conditions are based on the windshield survey, not an in-depth structural review.

Good:	27
Fair:	18
Dilapidated:	4
Unknown:	6

“Unknown” means the field team confirmed there were buildings in the area but did not venture on private property in rural areas or otherwise could not get close enough to verify the condition of the buildings.

Repetitive Loss Areas					
Field Findings Area Name	Buildings	Flooding Source	Building Type	Foundation Type	Mitigation in area
Aberdeen 1	>500	Tidal, Fry Creek	SF+	Crawl+	Elev.
Aberdeen 2-A	2	Tidal, drainage	Com'l	Slab	
Aberdeen 2-B	10	Wishkah R., tidal	MF	Crawl	
Aberdeen 3	3	Tidal	SF+	Slab	
Bucoda 1	~175	Skookumchuck R.	SF	Crawl+	Elev.+
Centralia 1	133	Skookumchuck R.	SF	Elev.	Elev.
Centralia 2	132	Skookumchuck R.	SF+	Elev.	Elev.
Centralia 3	52	Skookumchuck R.	Com'l+	Elev.	Elev.
Centralia 4	40	Chehalis R.	SF	Elev.	Elev.
Centralia 5	184	Chehalis R., China Cr.	SF+	Elev.	Elev.
Centralia 6	33	Chehalis R.	SF	Elev.	Elev.
Centralia 7	94	Chehalis R.	SF	Elev.	Elev.
Centralia 8	94	Chehalis, Salzer Cr.	SF+	Elev.+	Elev.
Chehalis 1	14	Chehalis, Newaukum	SF	Elev.+	Elev.+
Chehalis 2	41	Chehalis, Newaukum	SF+	Elev.+	Elev.+
Chehalis 3	22	Chehalis, Newaukum	SF+	Elev.+	Elev.+
Chehalis 4	25	Chehalis R.	SF	Elev.	Elev.+
Chehalis 5-A	6	Chehalis R.	SF	Elev.	Elev.
Chehalis 5-B	11	Chehalis R.	Com'l	Crawl	
Chehalis 5-C	10	Chehalis, Coal Cr.	Com'l	Slab	
Chehalis 5-D	3	Chehalis, Coal Cr.	Com'l	Slab	
Grays Harbor County 1	7	Wishkah R.	SF	Crawl	Elev.
Grays Harbor County 2	4	Charley Creek	SF	Unk	
Grays Harbor County 3	8	Wynooche R.	SF	Unk	
Grays Harbor County 4	2	Chehalis R.	SF	Ink	Elev.
Grays Harbor County 5	3	W. Fk. Satsop R.	SF	Crawl	
Grays Harbor County 6	35	Satsop R.	SF	Elev.+	Elev.+
Grays Harbor County 7	10	Satsop R.	SF	Elev.+	Elev.
Grays Harbor County 8-A	2	Chehalis R.	Com'l+	Elev.	Elev.
Grays Harbor County 8-B	1	Local drainage	SF	Elev.	Elev.
Grays Harbor County 9	2	Chehalis R.	SF	Elev.	Elev.
Grays Harbor County 10	4	Chehalis R.	SF+	Ink	
Grays Harbor County 12	7	Chehalis, Black R.	SF	Ink	
Grays Harbor County 13	6	Chehalis R.	SF	Elev.	Elev.
Grays Harbor County 14	4	Chehalis R.	SF	Crawl	Elev.+
Grays Harbor County 15	2	Chehalis R.	SF	Elev.	Elev.
Lewis County 2	1	Independence Cr.	SF	Crawl	
Lewis County 3	36	Chehalis R., Lincoln Cr.	SF	Elev.+	Elev.

Repetitive Loss Areas					
Field Findings Area Name	Buildings	Flooding Source	Building Type	Foundation Type	Mitigation in area
Lewis County 4	27	Chehalis R.	SF	Elev.+	Elev.
Lewis County 5	12	Skookumchuck R.	SF	Elev.+	Elev.+
Lewis County 6	17	Big Hanaford Cr.	SF	Slab	Wall
Lewis County 7	30	Chehalis R., Salzer Cr.	SF+	Elev.+	Elev.
Lewis County 8	3	Bunker Cr.	SF	Crawl	
Lewis County 9	5	Bunker Cr., Chehalis	SF	Crawl	
Lewis County 10	8	SF Chehalis, Lake Cr.	SF+	Slab	
Lewis County 13	7	Chehalis, Newaukum	SF	Crawl	
Lewis County 14	5	Chehalis, Newaukum	SF	Crawl	
Lewis County 15	2	Newaukum R.	SF	Crawl	
Lewis County 16	3	NF Newaukum R.	SF	Ink	
Lewis County 17	5	NF Newaukum R.	SF	Crawl	
Lewis County 18	5	SF Newaukum R.	SF	Ink	
Oakville 1	16	Chehalis, Harris Cr.	SF	Crawl+	
Thurston County 1	2	Chehalis, Black R.	SF	Ink	
Thurston County 2	3	Chehalis, Black R.	SF	Ink	
Thurston County 3	1	Chehalis R.	SF	Crawl	
Total: 55 areas	>1,850				

Some notes on the table:

- Building types:
  - SF = single family house(s)
  - Com'l = commercial building(s)
  - Ink = unknown or unable to observe. Usually the field team could not see the feature without going on to private property. In several instances it was not safe to stop on a busy highway.
- “+” means the entry is for the predominant feature. For example, under “building type,” “SF+” means that most of the buildings are single family houses, but there are other types of buildings in that repetitive loss area.
- Building and foundation types are based on the windshield survey, i.e., what could be seen from the street or road. More detailed information should be collected as part of a repetitive loss area analysis (see page 23).
- Lewis County has 15 areas. The numbering starts with “Lewis County 2.” Areas 11 and 12 have been mitigated since the County numbered its areas.

## Summary

With the shortcomings in the data mentioned above in mind, here are some statistics:

- There are 55 different known repetitive flood loss areas in the Chehalis Basin. Maps showing the locations of these areas are in Appendix 1.
- These areas are spread widely across the basin, in both populated and rural areas.
- Ninety percent (90%) of the areas are next to, and subject to overbank flooding by, the Chehalis or other large river or creek.
- Four areas are subject to tidal flooding and only two are repeatedly flooded solely by local drainage problems.
- The 55 areas have approximately 1,850 buildings in them.
  - Most of the buildings are single family homes
  - Most of the buildings are on crawlspace or elevated foundations, the types of foundations that are most cost-effective to elevate above flood levels.
  - The buildings in 45 of the 55 areas (82%) are considered in “good” or “fair” condition.
  - Thirty of the 55 areas (55%) already have some buildings that have undertaken mitigation measures. There may be more, but the field team did not go onto private property and could not tell for several of the areas.
- The most common existing mitigation measure taken to date is elevation of the building. Some low floodwalls were noted.

In sum, there are a lot of repetitive flood loss areas and potential repetitive flood loss properties in the Chehalis River Basin. For the most part, the buildings are single family homes in fair or good condition. The bulk of them can probably be mitigated using feasible measures that have already been implemented on some of the buildings in the areas.

## Loss Reduction Tools

There are four general approaches to mitigating the impact of repetitive flooding on buildings:

1. Regulations: Construction standards for new buildings and building improvements;
2. Flood control measures: Projects that keep floodwaters away from buildings;
3. Retrofitting: Modifications to buildings that incorporate flood protection measures; and
4. Public information: Informing and educating people about protective measures.

This section reviews these four tools. To be most effective a program should include all four.

### Regulations

In some cases, a community's floodplain management regulations will mitigate repetitive flood losses. This section reviews those regulations and identifies additional ones that can help.

The minimum regulatory criteria for floodplain management in communities participating in the NFIP are detailed in 44 CFR parts 59 and 60 of the Code of Federal Regulations. In order to participate in the NFIP, communities must adopt and enforce regulations or ordinances that meet or exceed those criteria.

The regulations address many aspects of land development, including development other than buildings. This section discusses the three specific provisions that have a bearing on repetitively flooded buildings:

- Post-FIRM standards
- Building enclosure requirements
- Substantial improvement and substantial damage requirements

### Post-FIRM Standards

For new buildings constructed in a Special Flood Hazard Area (SFHA) after the date of the community's initial FIRM, the NFIP (and the community's ordinance) require that the lowest floor must be at or above the base flood elevation (BFE). The base flood elevation is commonly referred to as the 100-year flood elevation. It is the level to which the 1 percent annual chance flood is predicted to reach and is the minimum protection level for new construction under the NFIP. Some communities, including Thurston County, have higher standards for determining the BFE and/or for the building protection level.

Elevation to or above the BFE is a requirement for residential buildings in the SFHA. Elevation may be accomplished by putting the building on pilings, posts, piers, columns, compacted fill, or extended foundation walls. Nonresidential buildings may be elevated or dry floodproofed (made substantially impermeable to floodwater). It should be noted that while fill is allowed as an elevation measure, it can have adverse impacts on flood flows. The Community Rating System now credits prohibiting filling because of the problems it can create.

Studies indicate that post-FIRM standards work well in reducing flood damage. The best measure of the effectiveness of these standards is the NFIP insurance premium rate structure for post-FIRM buildings. Premiums reflect risk of damage and they are significantly lower for buildings that are elevated to or above the BFE.

In short, this NFIP requirement should ensure that all new buildings are protected from the base flood and, therefore, from repetitive flooding. This only works under three conditions:

- The building site has to be in the mapped Special Flood Hazard Area. The regulations do not apply outside the SFHA (although Thurston County does regulate some non SFHA areas). Most, but not all, of the 55 repetitive loss areas in the Basin are in the SFHA.
- The current map has to accurately depict the base flood. This is not the case where the map has no BFE for an area (known as “approximate A Zones”) or where the map is out of date. Most, but not all, of the maps have shortcomings. These are discussed in each of the floodplain management analysis reports provided to the twelve communities.
- The buildings have to meet all the NFIP flood protection standards. During the field work, the team found numerous cases of elevated buildings that did not have the required flood openings or they were not properly installed. Without proper openings to allow the flow of water under a structure, hydrostatic pressures can buckle the walls or floor of a post-FIRM building.

Communities are encouraged to correct or improve their maps. There is Community Rating System credit for communities that improve their maps and for regulating known flood problem areas outside the SFHA (CRS Activity 410 (Floodplain Mapping)).

### **Building Enclosure Requirements**

The NFIP’s post-FIRM standards require that any area below an elevated building located in the SFHA must comply with certain requirements. These requirements are intended to reduce damage to the building as well as its contents:

- The walls surrounding enclosed areas must have openings within 12” of the lowest adjacent grade to allow floodwaters to freely flow in and out to minimize the pressure of floodwater. Tests have shown that as little as three feet of hydrostatic pressure (pressure from standing water) can collapse a wall not constructed to resist pressure from the side.
- Enclosed areas are to be left unfinished and all materials below the BFE must be water-resistant.
- Uses of enclosed areas are limited to building access (foyers, stairwells), parking, limited storage, and crawlspaces.
- Utilities, including appliances and service equipment, must all be elevated above the BFE.

The most common problem with elevated post-FIRM buildings is improving the lower area, below the originally intended finished floor. Owners who have forgotten the last flood (or have not been flooded since they purchased the property) are often tempted to remodel the lower level to gain more living space. They replace bare walls and floors with carpeting, furniture, insulation, and even plumbing fixtures.



Elevated house in a Grays Harbor County repetitive loss area

Often such modifications happen behind enclosed walls and/or in remote areas and the building officials are not aware of them. If flooded, the owner can receive a flood insurance claim if the adjuster is not aware of the code requirements at the time of construction. If the problems are caught, the building should be re-rated and be subject to insurance premiums for an unprotected building.

The field team found numerous examples of buildings in repetitive loss areas that were already elevated (see below). It may be that they were built before the floodplain management rules went into effect or buildings constructed to post-FIRM standards were later modified. In other words, a windshield survey of an elevated building does not confirm that the building is protected from flood damage. It may have been built in compliance but received flood insurance claims for flood damage to a supposedly floodproofed area after the owner remodeled that area.

<p>This is an example of a properly elevated house in a repetitive loss area. Note the location of the openings, near the ground.</p>	<p>This is an example of an improperly elevated building in the Basin. The openings are too high to relieve hydrostatic pressure.</p>	<p>This is what happens to a block wall when the openings do not meet code and water pressure is not equalized.</p>

The Community Rating System provides credit for three higher regulatory standards that can address this problem. All three are found in CRS Activity 430 (Higher Regulatory Standards) in the 2013 *CRS Coordinator's Manual*.

- Credit is provided for requiring that the owner sign and record a deed restriction that specifically notifies future owners about the limitations on enclosures and the insurance consequences if enclosures are modified in a noncompliant manner.
- Credit is provided for prohibiting the lower floor of an elevated building from being enclosed. This can be unpopular for owners who want a garage or storage area protected from theft or the elements.

- Credit is provided for having the authority to conduct inspections of buildings long after the certificate of occupancy has been issued. This is done in some communities at the time of resale or when a new renter moves in and is often based on the housing maintenance code authorities. If the inspection finds that the building has been altered so it is no longer in compliance with its original permit, the building official can take action.

## **Substantial Improvement and Substantial Damage**

The vast majority of repetitive loss properties in the nation are pre-FIRM buildings. It is assumed that a pre-FIRM building was not constructed to be protected from the base flood. For insurance and regulatory purposes, they are “grandfathered in” and do not have to be protected from flooding. NFIP communities are required to address pre-FIRM buildings in two situations: when someone proposes major improvements and when major repairs are required.

“Substantial Improvement” is defined as any repair, reconstruction, rehabilitation, addition or improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the improvement or repair is started.

“Substantial Damage” occurs if an existing building is damaged by any cause and the cost of repairing it to the pre-damage condition equals or exceeds 50 percent of the building’s market value (prior to the event).

If an existing building undergoes improvements that qualify as a substantial improvement, the regulations require that the building be brought into compliance with the post-FIRM standards discussed earlier in this section. For most residential buildings, this prompts elevation-in-place, filling in any existing subgrade basement, or moving equipment and ductwork out of a crawlspace. Nonresidential buildings may also be floodproofed to meet the post-FIRM requirement.

The same applies for a substantially damaged building, but the owner may opt to demolish the structure and rebuild in full compliance with all building code and floodplain management requirements in effect at that time.

Regardless of the cause of damage, the NFIP regulations require local officials to make substantial damage determinations. They must determine the costs to repair and the market value of the building. Owners may be required to provide contractor estimates or to obtain appraisals to support (or counter) the local official’s determination. Experience has shown that making these required determinations can be difficult, especially when a large number of properties have been damaged by flooding or other disasters and staff resources are strained. Repairs are often started without the required permits and well before local officials are able to make appropriate determinations.

Substantial improvement/substantial damage regulations are the primary regulatory tool for bringing existing buildings up to the base flood protection level. Their success has been hampered by four factors:

1. As with the post-FIRM standards, these rules are in effect only in the regulatory floodplain. In all but Thurston County, that means the Special Flood Hazard Area on the FEMA Flood Insurance Rate Map.
2. An owner can get around the substantial improvement rule by submitting plans for a project worth less than 50% of the building and then applying later for another permit to complete the project.
3. The substantial damage rule is only effective if a building is substantially damaged. A review of available claims data shows that few repetitive loss buildings received very large claim payments (the files provided by FEMA to the Thurston County communities did not include the amount of the paid claim).

Only in Centralia, Chehalis, and Lewis Counties were there claim payments for more than \$100,000, and most of them were for commercial properties and non-repetitive loss buildings (presumably they were brought into compliance and did not get a second claim). Most of the claim payments were for less than \$50,000 and at least half were under \$10,000. Damage at these low levels will not be considered “substantial.”

4. Enforcing the substantial damage rules after a flood or other disaster is very difficult, both politically and administratively. Success often depends on a lot of assistance and oversight from the State and FEMA.

To improve the quality and consistency of substantial damage determinations, several years ago FEMA developed the Substantial Damage Estimator (SDE). It is a standardized methodology that allows the local official to input local parameters, such as area building construction costs. Most communities are now using this approach to make determinations simpler and more objective. More information can be found at <http://www.fema.gov/media-library/assets/documents/18692>.

To counter the regulatory shortcomings, the Community Rating System provides credit for regulations that count improvements cumulatively and/or that use a threshold lower than 50% (Activity 430 (Higher Regulatory Standards)). Thurston County’s regulations count improvements cumulatively and the County is receiving the CRS credit.

## **Administration and Enforcement**

Regulatory standards are only as effective as their enforcement. The floodplain management assessment reports for the 12 communities noted that some do not have full-time staff and most do not have enough floodplain construction for the staff to gain experience in these standards. These reports recommend training and on-call technical assistance to help with administration and enforcement.

This report also recommends training and on-call technical assistance, not only for regulating new development, but also on FEMA’s Substantial Damage Estimator. The assistance should help set up procedures to follow after a flood or other disaster on enforcement of the reconstruction rules, determining substantial damage, and informing property owners about mitigation opportunities.

## Flood Control Measures

Flood control projects modify flood flows and reduce the level of flooding. These are public projects and are constructed at some distance from the protected properties. Examples include:

- Flood control dams
- Detention/retention basins
- Levees and floodwalls
- Channel modifications
- Modifications to bridges and culverts to alleviate backwater flooding

Flood control projects are most desired by property owners and local officials for the following reasons:

- There is little disruption to the neighborhood and residents
- Someone else (usually a government agency) will fix the problem
- Public ownership and maintenance responsibilities are generally more dependable
- Multi-purpose projects, such as recreation or water supply reservoirs, can be community assets
- Reduced flood risk improves the market value of properties
- By not changing existing development, they retain the local tax base

However, flood control projects have the following limitations:

- They are most cost-effective when protecting more densely developed areas, not one or two properties.
- They often disturb the land and disrupt natural water flows, which can negatively impact fish habitat and natural and beneficial floodplain functions.
- They require regular maintenance, necessitating a continuing public outlay.
- They are built to a specific flood protection level that can be exceeded by larger floods.
- They can create a false sense of security as people in the protected area think that a flood will never exceed the design level.
- Unless the project lowers the base flood elevation to warrant remapping the area, they do not reduce the cost of flood insurance.

Three of the proposed projects being evaluated by the Flood Authority will reduce flood levels in some of the repetitive loss areas:

- Upstream retention structure
- Dillenbaugh Creek realignment
- Salzer Creek backwater control structure

Further, the proposed Washington State Department of Transportation Alternative 1 project to protect Interstate-5, in combination with the above proposed projects, could also result in reduced flooding in some of the Repetitive Loss Areas.

Thirty-one of the 55 repetitive loss areas could benefit from the above proposed projects:

- City of Chehalis: all 8 areas
- City of Centralia: Areas 3, 4, 5, 6, 7, 8
- Lewis County: Areas 2, 3, 4, 7, 9, 13, 14
- Thurston County: Areas 1, 2
- Grays Harbor County: Areas 4, 8-A, 9, 10, 12, 13, 14
- Oakville: Area 1

If the projects result in FEMA remapping a repetitive loss area to remove it from the Special Flood Hazard Area, the project is usually considered adequate mitigation. Once it is confirmed if any of the four flood control projects will be constructed and will result in remapping, the unmitigated areas should be considered eligible for retrofitting support (see the next section).

## **Retrofitting**

A variety of retrofitting measures can reduce a building's exposure to damage by flooding. These are implemented by the property owner, but some measures can be funded by a government grant. The most common ones are reviewed in this section. They are covered under four general categories:

- Removing the structure from harm's way
- Elevating it above flood levels,
- Modifying the grounds to keep water away, and
- Floodproofing the structure to minimize damage from the water

## **Removal**

Under this measure, either the property is acquired and the building demolished or the building is detached from its foundation and moved to a location outside of the floodplain. This is the best retrofitting measure in high hazard areas, such as high velocity or deep flooding and riverine shorelines subject to erosion.

Advantages of removal include:

- Permanent protection from flooding
- Provides open space for public use
- Best approach for dilapidated or unsound structures
- Lewis, Centralia, and Chehalis have experience with this approach and there are knowledgeable contractors in the area

Disadvantages of removal include:

- Acquisition is likely to be the most expensive measure (although, there are FEMA grants for acquisition and clearance of repetitive loss properties)
- Relocation can be very expensive, especially for buildings with slab foundations
- Communities may not want to accept ownership and maintenance for the vacant land
- Communities may not want to lose the tax base and utility payments
- Is not likely to be funded by the owners (who essentially would have to give away their properties to the community)
- Voluntary relocation programs leave a “checkerboard” effect, with both vacant lots and existing buildings (see aerial photo)
- Communities still must provide services to the remaining properties at a higher cost per property. For example, the same length of street will need to be maintained, even though it serves fewer properties.



This aerial photo shows the “checkerboard” effect that results when some owners opt to sell their floodprone property, but others do not volunteer. (Google Earth©)

## Elevation

With this measure, all damage-prone parts of the building are elevated above the flood protection level on a foundation intended to resist flood damage. This technique has variations that achieve the same result, including:

- Ground-floor conversion (where the living area is relocated to a new second story)
- By wet floodproofing a crawlspace or lower area and moving utilities up to the first floor, the building can be re-rated based on the elevation of the first floor
- “Mitigation reconstruction” where an existing building is replaced by a new, elevated structure on the same lot (also known as “demo/rebuild”)



The standard elevation technique is to jack the structure above the flood level and then construct a supporting wall.

Advantages of elevation include:

- The building meets the post-FIRM flood protection standards
- Reduced flood insurance premium rates
- Most cost-effective for buildings on crawlspaces or elevated foundations
- Retains tax base and neighborhood integrity
- Lewis County, Centralia, and Chehalis have experience with this approach

Disadvantages of elevation:

- Can be expensive (although the cost to the owner can be reduced by FEMA grants and the Increased Cost of Compliance provision in a flood insurance policy)
- Owners are concerned about the appearance
- Difficult for residents with mobility limitations
- May require a height variance in communities with height restrictions
- Enclosures below the elevated floor are subject to illegal conversion to a finished, livable damage-prone area. This is discussed in the section on Regulations, page 12.
- Owners may be out of their homes for up to several months during construction

## Flood Barriers

Barriers are modifications that divert shallow floodwaters away from a structure. Typical barriers are levees, dikes, floodwalls, berms, and regrading a yard. If warning time allows (possibly at the lower end of the Chehalis River), sandbagging or emergency walls could be erected.

Advantages of flood barriers include:

- Little disruption to existing buildings
- Can protect more than one building

Disadvantages of flood barriers:

- Only work in relatively shallow flooding, e.g., less than three feet deep
- Only work in areas where the soils are relatively impervious. Otherwise, floodwaters seep under or through the barrier.
- Only work where there is room to divert surface water without adversely affecting other properties. Barriers are generally not allowed in a regulatory floodway
- Overtopping or failure can lead to more significant damage than if the barrier had not been constructed in the first place
- If maintenance is neglected in one spot, the entire protected area can be flooded
- May require considerable land area



The owner of this house in Centralia built this floodwall around the house after his first flood. It has worked during subsequent floods.

- May have openings that require human intervention to install them, so adequate flood warning time is needed
- Does not bring a building up to post-FIRM standards
- Does not reduce the cost of flood insurance

## Floodproofing

There are two types of floodproofing:

- Dry floodproofing modifies walls and openings in order to keep floodwaters out of a building. The building itself is part of the barrier to the passage of floodwaters.
- Wet floodproofing allows water to enter the building, but the interior use, finishes, and contents are modified so damage is prevented or minimized.

Floodproofing works best to protect a structure from shallow, slow-moving water (although wet floodproofing can be effective against deeper, still, water). The buildings must be structurally sound.

Advantages of floodproofing include:

- Generally low cost
- Some measures can be undertaken by the owner
- Does not usually affect the exterior appearance of the building
- A nonresidential building dry floodproofed to one foot or more above the base flood elevation can receive a lower flood insurance premium



Elevating the water heater and furnace are easy and inexpensive examples of wet floodproofing.

Disadvantages:

- Usually requires human intervention to complete the protection measure (e.g., installing a shield in a doorway), so adequate flood warning time is needed
- Often requires continuous maintenance to remain effective
- Does not bring a residential building up to post-FIRM standards
- Does not reduce the cost of flood insurance for a residential building
- Dry floodproofing measures for a nonresidential building must be recertified each time the flood insurance premium is due

## Funding

There are five sources of funding for retrofitting projects:

1. The Federal Emergency Management Agency. There are several FEMA mitigation grants that are administered by the State's Emergency Management Division. These grants typically fund 75% of the cost of a project. The non-FEMA share is paid by the State, the community, or in many areas, by the benefitting property owner.

Several of the Basin communities have used these funds and they report that the paperwork and complications make them very hesitant to apply for another grant in the future. After a flood, it often takes up to two years to receive funds from FEMA's Hazard Mitigation Grant Program, making it very hard to gain and keep the interest of property owners who have to find a place to live during the interim. There are grants from the 2007 flood that have not yet been closed.

FEMA's disaster assistance program can also fund retrofitting of flooded public properties as part of their repairs.

2. State funds. The Department of Ecology's Flood Control Assistance Account Program (FCAAP) provides grants to communities. There is a 25% match in non-State funds for most grant awards. Non-emergency projects may not exceed \$500,000 per biennium. Current legislation provides that State funding is limited to \$4 million per biennium. Three cities and the three counties have had FCAAP plans that make them eligible for this funding. However, due to State budget restrictions, no grants are being offered during the biennium ending on June 30, 2015.
3. Flood Authority funds. The Flood Authority has received special appropriations in the past. It currently has \$1.5 million for flood loss mitigation. Guidelines on how these funds will be used are being developed.
4. Community funds. Each city and county has the authority to fund flood protection projects. Traditionally they do not fund retrofitting projects, as long as there are state and federal funding sources.
5. Property owners. Owners can be asked to contribute to an activity that directly benefits their properties. In many cases, owners have been willing to cover the 25% non-federal share of a FEMA grant. Where the cost of the project is relatively low, owners may well pay 100%. This is especially true after a flood when they may have cash from an insurance claim, disaster assistance, and/or the NFIP's Increased Cost of Compliance extra flood insurance claim payment.

Another advantage of owners contributing is that it gives them an investment in the project and an incentive to make sure the project is properly maintained.

Which funding source to use is dependent on the situation, the cost of the project, and the level of property owner interest. For example, after a flood that substantially damages buildings, it makes sense to pursue FEMA funds to cover 75% of the more expensive elevation projects. For

less expensive projects, especially when subject to shallow flooding that does not warrant a disaster declaration, more property owner contributions might be sought.

This report recommends maximum use of owner contributions to help public funds go farther and to provide the incentive for owners to maintain their investment. On the other hand, acquisition projects should be fully funded by government programs.

### **Measures Appropriate for the Chehalis Basin**

It can be seen that there are several different types of retrofitting measures. The more effective ones are more expensive, but there are FEMA mitigation grants for removal and elevation projects and those grants have repetitive loss properties as a priority.

In areas of shallow flooding, less expensive measures can often be constructed by the property owner. However, these measures are less dependable, may not work if no one is available to install them, and do not reduce the cost of flood insurance.

Elevation is likely to be the most appropriate measure for most of the buildings in the Basin's repetitive loss areas for the following reasons:

- Flooding in many areas is more than two or three feet deep
- Most buildings are on crawlspace or elevated foundations, which are the least expensive to raise
- Elevation is already an accepted measure in many areas
- Human intervention during a flood is not usually needed
- There are experienced elevation contractors in the area, although not all elevation projects have met all the NFIP post-FIRM standards
- There are FEMA mitigation grants to elevate buildings that meet the grant program prerequisites
- The cost of an elevation project will be balanced over time by the savings in flood insurance premiums

The other measures may still be appropriate where the flood hazard, building type and condition, and owner's desires are conducive to their use.

### **Selecting the Best Measure**

The most appropriate retrofitting measure depends on a variety of factors, including:

- Building condition
- Flood hazard
- Appearance
- Finances

There are decision trees that help make the selection based on the first two factors. In the end, it is up to the owner to decide if his or her home or business will be altered in order to protect it from the next flood. Even if a measure will work very well, if the owner doesn't like the way it looks, cannot afford it, or does not feel it will flood again soon, it probably will not be implemented.

Communities can help the decision process with technical and financial assistance. The CRS credits two technical assistance efforts:

- Activity 360 (Flood Protection Assistance) provides credit for one-on-one discussions with a property owner on their flood problems and what they can do about it. Credit is increased if the community's advice is provided after a site visit.
- Activity 510 (Floodplain Management Planning) credits a repetitive loss area analysis (RLAA). An RLAA can qualify as the mitigation plan required for Category C communities (see page 5).

## Public Information

Disseminating information is a vital part of any repetitive flooding mitigation program for two reasons. First, those affected by the program need to know the hazard they face and what they can do. As with any government program, the support and cooperation of all parties is essential for effective implementation. Those affected include the property owners, Federal, State and local officials, insurance adjusters, building contractors, and many others who can play a role in mitigating repetitive flooding.

Second, information dissemination can bring about voluntary mitigation activities at little or no cost to the government. People implemented flood mitigation projects long before there were NFIP regulations and funding programs. The box to the right summarizes one research project's findings.

There are two key parts of an information dissemination program: the messages and the ways they are disseminated.

### Area Analyses

A repetitive loss area analysis is an in-depth review of each repetitive loss area, alternative loss reduction measures (including flood control projects), and recommendations on a building-by-building basis. It can be an objective way to select appropriate mitigation measures. The analysis report can be useful to both local officials and property owners.

### Information Brings Results

Dr. Shirley Laska, of the University of New Orleans, has studied various programs that encourage flood-prone homeowner "self-protective behavior." In her book she notes: "The research reported herein demonstrates considerable interest among and effort by flooded homeowners to retrofit their homes to protect them from future flood damage. Several measures were undertaken by those who retrofitted. Moreover, they spent their own money – often considerable sums – to implement the measures...."

"Having some source of retrofitting information appeared to encourage retrofitting, and the measures implemented by flooded homeowners who did consult an information source were evaluated by those owners as more protective than the measures implemented by homeowners who did not rely on a source."

*Floodproof Retrofitting – Homeowner Self-Protective Behavior*, University of Colorado, 1991, pages 221 and 223.

## Messages

Five messages are appropriate for an information program for repetitive flooding:

1. The hazard of repetitive flooding: This includes what flooding does to buildings, their contents, and their occupants. Hazard information is particularly important for:
  - People who moved to a repetitive loss area since the last time it was flooded. Many have no idea there's a problem.
  - Properties outside the SFHA where the mortgage lender does not have to tell (and may not know) that the area is subject to flooding.
  - Properties in the SFHA that do not have a mortgage.
2. Ways to mitigate the impact of repetitive flooding: Retrofitting measures that can be initiated by the property owner are discussed in the previous section. An information program should describe these measures in lay terms, show success stories where they have been used effectively, and explain the costs and benefits of the different approaches.
3. Where to get help to mitigate the problem: A public information program should convey the message that property owners are not being left alone to deal with their problem. Sources of technical and financial assistance should be described.
4. Relevant building regulations: Repetitive flood loss property owners need to understand that there are codes that may affect their freedom to mitigate. For example, they cannot divert water onto someone else's land or increase the damage potential of the lower area in an elevated structure. At a minimum, the message should say "get a permit" and encourage owners to talk to the permit officials.
5. Flood insurance: Given that many buildings in the Basin are not currently insured and that some new residents may not be aware of the hazard, explaining the benefits of having full flood insurance coverage would benefit repetitive loss area residents. Insurance can be viewed as a mitigation measure, as it can help pay for implementing a retrofitting project and even to help cover the cost of bringing a substantially damaged building up to post-FIRM standards.

Lessons have been learned from experience and research by FEMA and the American Red Cross. The following guidelines are recommended for all information activities:

- The message, especially the description of the problem, needs to be expressed in human terms
- The messages need to focus on successful cases where mitigation has helped people
- The messages need to carefully explain the positive benefits of mitigation
- According to research conducted by the American Red Cross, the message needs to be repeated more than 20 times before the recipient accepts and retains the message

- The message should also be repeated by different parties, including elected officials, government staff, building contractors, engineers, insurance agents, adjusters, and others who communicate with property owners
- A special effort should be made to quickly reach repetitive loss areas and property owners after a flood

## Disseminating the Messages

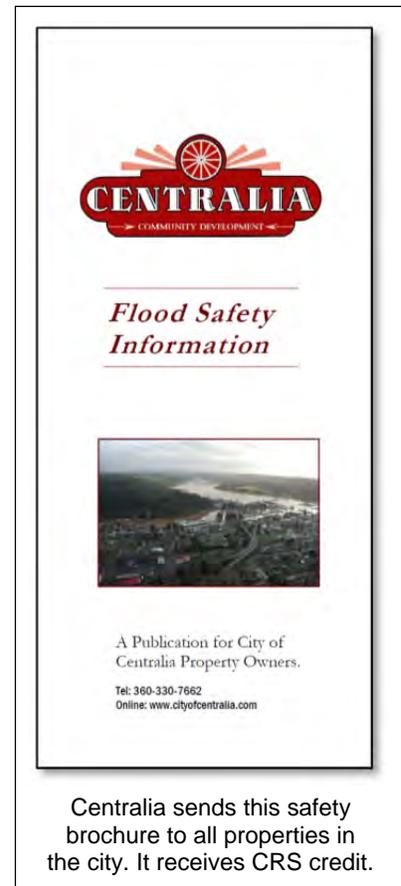
How the messages are delivered can determine the success of a public information program. The usual approach involves two levels of outreach. The first is to broadcast a short and simple version of the message to everyone potentially affected. The second level provides more detailed information to those who want to learn more.

Examples of projects that broadcast the message to everyone in a community or a repetitive loss area include:

- News releases, newspaper articles, public service announcements
- Brochures and booklets
- Mailings sent directly to owners of repetitive loss properties
- Presentations at service organizations, homeowners' associations, and other meetings likely to be attended by the owners
- Open houses and home improvement fairs
- Information inserted in utility or tax bills

People who are interested in learning more about their flood hazard, possible mitigation funding sources, and alternative mitigation measures need ready access to references and technical assistance. Examples of these services include:

- Providing information about past and potential flooding to inquirers
- Putting reference materials in the local library and/or sending them directly to requestors
- Developing websites on appropriate measures and links to more information (see example, next page)
- Visiting repetitive loss properties and offering mitigation suggestions to the owners
- Preparing plans and specifications for a repetitive loss mitigation project



**Back to Community Development**

Newsletter (Monthly)  
Electronic Message Sign  
Public Hearing Notices  
Press Release  
Annexations  
Land Use Applications and Forms  
Building Permits  
Volunteer Boards and Commissions  
Comprehensive Plans and Documents  
Demographics  
Flood Information  
1993 Flood Phase Guidelines Manual  
Comprehensive Flood Management & Natural Hazards Mitigation Plan  
Flood Forms and Handouts  
Flood Phase Map  
Floodplain Map  
National Flood Insurance Program  
Useful Flood Information Links  
Online City Maps  
Planning Division  
Zoning Information  
Historic Preservation  
Critical Areas  
Shoreline Master Plan Update

**Flood Information**

**IMPORTANT UPDATES FOR FLOOD INSURANCE POLICIES:**

Beginning March 2013 FEMA has enacted significant changes to the flood insurance program. To view a fact sheets highlighting some of the major changes, please [click here](#).

**EMERGENCY MANAGEMENT**  
[Centralia Emergency Management](#)  
[Lewis County Emergency Management](#)

**FLOOD READY**  
Are you **flood ready**? Prepare now for the upcoming 2014/2015 flood season by creating a **hazard plan** for your home and **business** FEMA has created a great website to help you prepare.

- 1. Flood Hazards for Centralia** - Chehalis and Skookumchuck rivers, China creek, Salzer Creek, and Coffee Creek. Please [click here](#) for a flood informational handout that is distributed to all property owners, real estate, insurance agents, mortgage lenders, and lending institutions in the Special Hazard area of Centralia. For additional Hazards that could affect Centralia and Lewis County please [click here](#).
- 2. Flood Safety/Flood Response Preparations** - [safety information, evacuation tips, etc..](#)
- 3. Flood Insurance** - [National Flood Insurance Program](#), facts of coverage, etc..
- 4. Property Protection Measures** - [Ways to permanently retrofit a building, flood proofing measures, protecting against other hazards](#), etc...

2007 Flood

Centralia's website has a wealth of more detailed information on a variety of flood protection topics.

## CRS Credit

Community Rating System credits for public information activities are based on the following guidelines:

1. The Objective is to change behavior
2. Good public information programs work: behavior changes
3. Good programs:
  - Are locally tailored
  - Are positive
  - Say what people should do
  - Repeat the message
  - Repeat the message from different sources
  - Are periodically evaluated and revised

Credits are provided through seven activities in the public information series:

- Activity 310 (Elevation Certificates)
- Activity 320 (Map Information Service)
- Activity 330 (Outreach Projects)
- Activity 340 (Hazard Disclosure)
- Activity 350 (Flood Protection Information)
- Activity 360 (Flood Protection Assistance)
- Activity 370 (Flood Insurance Promotion)

Activity 330 supports the first level of outreach – broadcasting a short and simple version of the message to everyone potentially affected. Activity 330 encourages communities to use the many different ways to disseminate six messages that are priorities to the program. This list includes four of the five messages listed earlier as appropriate for a repetitive flooding mitigation program.

Topics	Example Messages
1. Know your flood hazard	Your property is subject to flooding
2. Insure your property for your flood hazard	Take advantage of a low-cost Preferred Risk Policy
3. Protect people from the hazard	Turn around, don't drown
4. Protect your property from the hazard	We can help you get a grant to elevate your home. Call us at
5. Build responsibly	Before you build, get a permit from ....
6. Protect natural floodplain functions	Report broken silt fences: they help keep our streams clean

Activities 320, 350, and 360 credit community efforts along the second outreach level – providing more detailed information when requested. Activity 350 credits having references in the community’s public library and having detailed information available through their websites. All four CRS communities are receiving credit under Activities 310 – 360. Activity 370 is new in the 2013 *CRS Coordinator’s Manual*.

## Summary

Public information efforts work. Research has shown that educating people about their repetitive flood hazard can motivate them to take steps to protect themselves and their properties.

There are some key guidelines to make public information efforts effective. These have been incorporated into the CRS credits for such efforts. The four CRS communities (Centralia, Chehalis, and Lewis and Thurston Counties) are implementing programs that receive these credits.

## Recommendations

The Flood Authority and the nine communities with repetitive loss areas should recognize the exposure of their residents and should implement programs to help mitigate the impacts of repetitive flooding. A strategy to reduce the problems from repetitive flooding should have the following features:

1. The programs should include activities from all four of the loss reduction tools: regulations, flood control, retrofitting, and public information.
2. The Community Rating System was made to encourage and support the types of efforts reviewed here. Communities should use the CRS for guidance and to gain support for implementing the planning, regulatory, retrofitting, and public information activities recommended by this report.
3. Communities should start by preparing a repetitive loss area analysis for each area.
4. Loss reduction projects should involve the property owners as much as possible. They are vital to any retrofitting and some mitigation measures can be implemented by owners without government funding.
5. Community staff should be prepared for mitigation opportunities that may arise when a building is to be improved and after a building has been damaged. Procedures should be developed to ensure full enforcement of the floodplain management development regulations and to act quickly after a flood or other disaster.

The following criteria are recommended for use of the Flood Authority's \$1.5 million for flood loss mitigation.

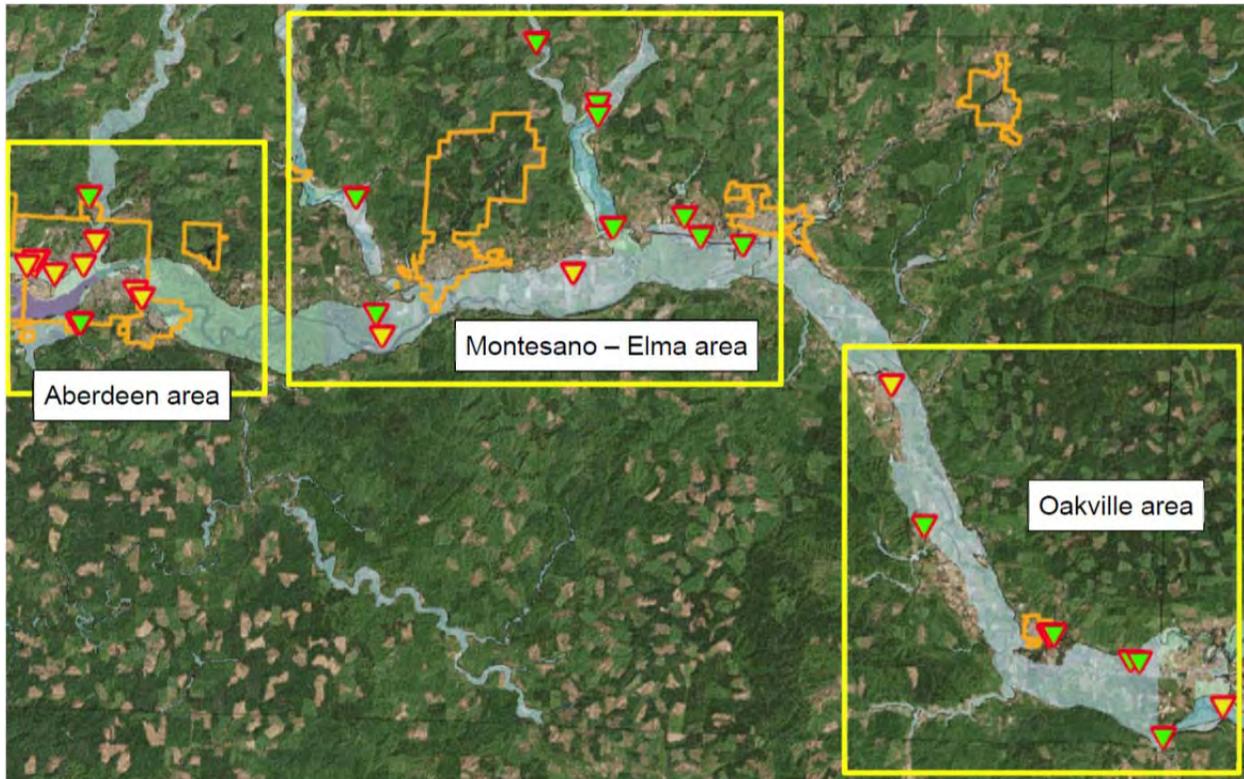
6. \$1,400,000 should be budgeted for funding retrofitting projects (there are separate Flood Authority sources for funding flood control projects). The following criteria should be used:
  - a. The Authority's share should be sufficient to assist all property owners, including those on limited incomes.
  - b. Funds should support and encourage city or county efforts. The Authority should not directly fund individual property owners.
  - c. The funds should help all residents of the Basin. Everyone should be informed of the various mitigation measures and sources of financial assistance. Everyone should have an equal chance to apply. Except where required by Federal funding criteria, there should be no differentiation between properties on FEMA's repetitive loss list and those that are not.
  - d. No elevation or acquisition project should be funded until a repetitive loss area analysis is prepared for that area. The analysis would be done by the community in accordance with CRS criteria.
  - e. No retrofitting assistance should be provided to a property that is slated to be protected by an area flood control project.

- f. Retrofitting projects in areas with no existing retrofitted buildings should be given some priority. Outside support helps the first person to retrofit. Once one person does it, the measure becomes more acceptable to the neighbors.
  - g. The programs should focus on mitigating the problem. “Mitigating” does not mean stopping all flooding or preventing all possible future flood damage. It means reducing the exposure of the property to repeated flood damage. In most cases, that will mean protecting the building from damage by the base or higher flood, but there is the possibility that higher floods would still cause damage. All mitigated buildings are still exposed to some flood risk and the owners should continue to carry flood insurance.
  - h. The programs should be cost-effective. There are three corollaries to this criterion:
    - 1) Federal grants programs have specific procedures to determine if the benefits exceed the cost of a project. Any Flood Authority funded program should follow the same procedures to provide consistency across the board.
    - 2) It may be more cost-effective to implement a retrofitting project that protects from shallow repetitive flooding than to bring a building up to post-FIRM standards, protected to the base flood.
    - 3) There may be cases where a building could remain exposed to repetitive shallow flooding that does not pose a threat to life safety. It may make more economic sense to continue to pay for flood insurance coverage and not spend thousands of taxpayer dollars to elevate, relocate, or build a flood control project to counter a minor hazard.
7. The remaining \$100,000 should be budgeted to fund technical assistance to communities interested in mitigating their repetitive losses. The assistance would include products and on-call response to help with the following:
- a. Public information materials on regulatory requirements, self-help retrofitting, flood insurance (and the premium benefit of elevating a building), and sources of financial assistance for communities to tailor for their programs.
  - b. Technical assistance to community staff providing advice to interested property owners.
  - c. Guidance and assistance on conducting repetitive loss area analyses.
  - d. Assistance in preparing post-flood procedures to act quickly to identify substantially damaged buildings and property owners interested in retrofitting and to take advantage of disaster assistance and Increased Cost of Compliance funds.
  - e. Working with State and FEMA staff to identify ways to improve administration of their grant programs so Basin communities will be interested in applying to them in the future.

While it cannot be predicted how many properties will be retrofitted or otherwise protected as a result of these technical assistance measures, the total cost is less than the cost of two \$60,000 elevation projects. If only two properties are protected by regulatory and public information tools, it would be a worthwhile investment.

## Appendix 1. Repetitive Loss Area Maps

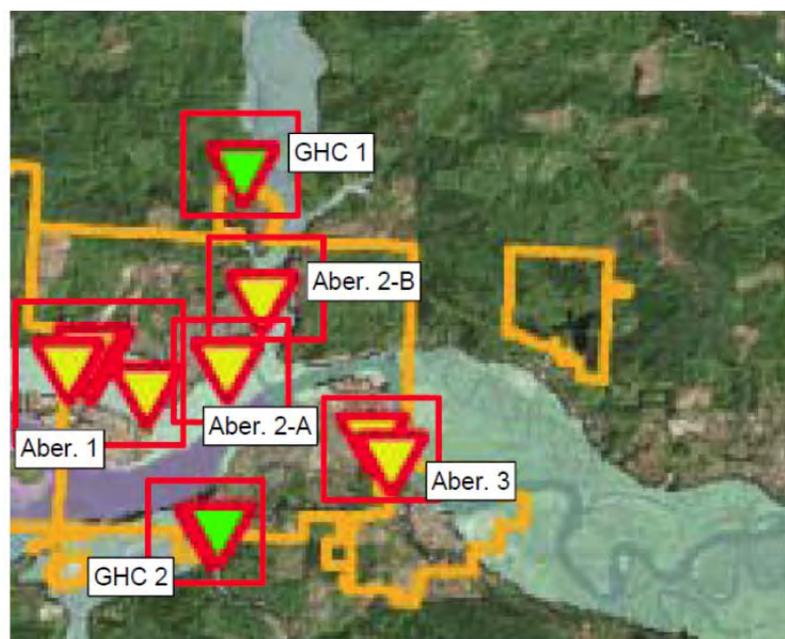
Maps of each area, showing which buildings are on FEMA's list, are available for the communities in Grays Harbor and Thurston Counties. They are not in this public document. Centralia, Chehalis, and Lewis County have their own detailed maps.

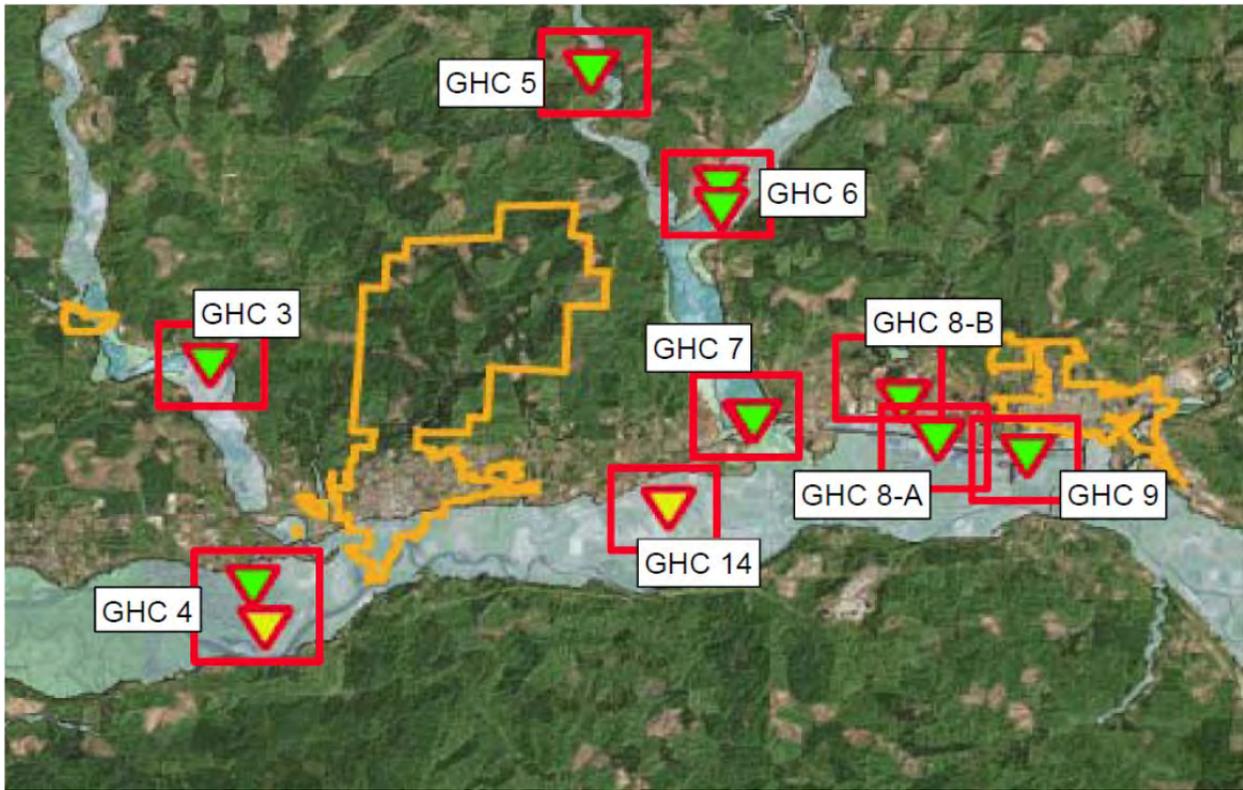


Grays Harbor County repetitive loss property plots

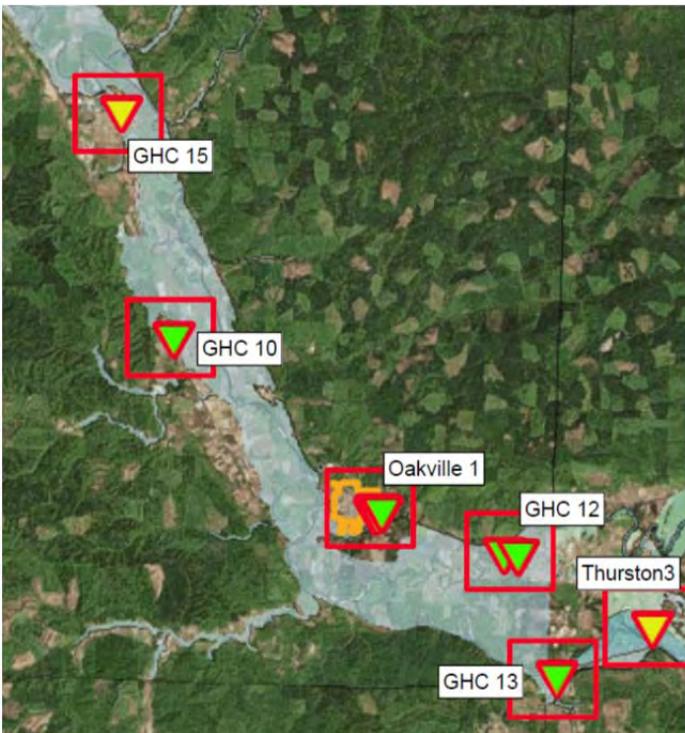
### Aberdeen area repetitive loss areas

The maps for Grays Harbor County areas show properties listed under the County's NFIP ID number as green triangles. Properties listed under a city's ID are in yellow. Note on the next page that the two NFIP list repetitive loss properties for Montesano (in yellow) are actually outside the city limits and are designated GHC 4 and GHC 14.

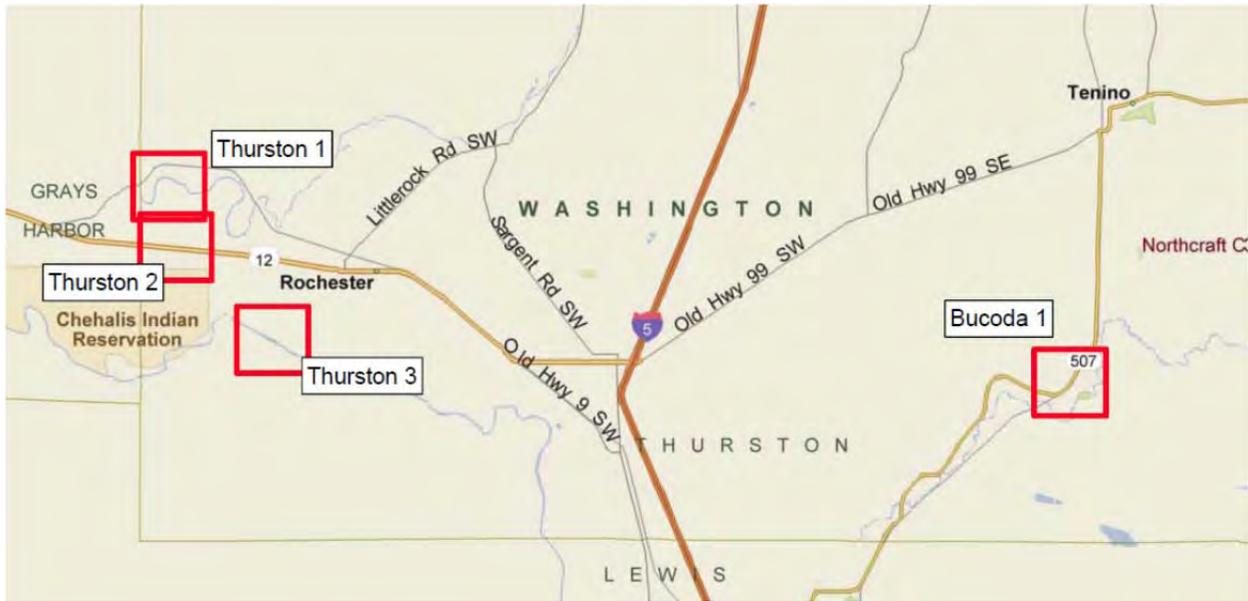




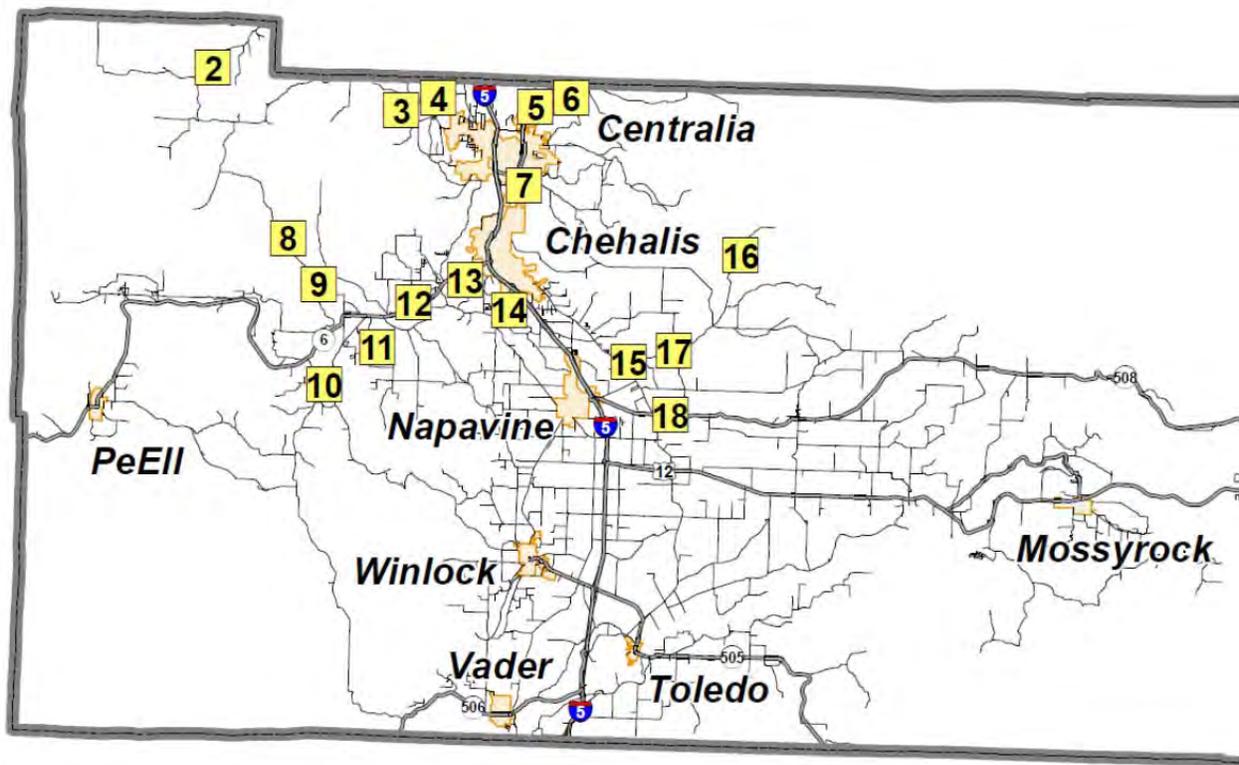
**Montesano – Elma area repetitive loss areas**



**Oakville area  
repetitive loss areas**



**Thurston County and Bucoda repetitive loss areas**



**Lewis County repetitive loss areas 2 – 18  
(Areas 11 and 12 have been mitigated)**

