

500 FLOOD DAMAGE REDUCTION ACTIVITIES

This series of activities focuses on reducing flood damage to existing buildings. It complements the previous series, which dealt with preventing damage to new development. Damage reduction measures that are recognized under this series include acquiring, relocating, or retrofitting existing buildings; maintaining and improving drainageways and retention basins; and planning for the best ways to implement these and other loss prevention and reduction activities.

Credit points for Activities 510, 520, and 530 are adjusted according to the number of buildings affected by the damage reduction measure. See Sections 301 through 303 for a discussion of impact adjustment ratios based on building counts.

Sections 501 through 503 and Activity 510 (Floodplain Management Planning) are mandatory for some or all repetitive loss communities. See Sections 501 and 502 for a discussion of the applicability of these requirements.

Section 507 discusses community compliance with applicable environmental and historic preservation laws and executive orders before implementation of a project or activity.

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501 The Repetitive Loss List

501.a. Repetitive losses

Repetitive loss properties are those properties for which two or more claims of more than \$1,000 have been paid by the National Flood Insurance Program (NFIP) within any 10-year period since 1978 (e.g., two claims during the periods 1978–1987, 1979–1988, etc.).

Almost \$9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments since 1978. Although the NFIP has resulted in 40 years of successful floodplain management, and many of these structures are no longer insured, repetitive loss properties are still a drain on the NFIP. Currently, 1.3% of all policies cover repetitive loss properties, but 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.

501.b. The Repetitive Loss List

Each year, the Federal Emergency Management Agency (FEMA) produces a list of repetitive loss properties for communities in or interested in the Community Rating System (CRS). Before applying for the CRS and at each verification cycle, a community must determine its repetitive loss category (see next section).

The list includes the property address, the dates of the claims, and, usually, the current insured's and/or previous owner's name. It is available digitally as an Excel spreadsheet and as individual worksheet pages (Repetitive Loss Update Worksheet (AW-501)). Either format can be ordered through the ISO/CRS Specialist or the FEMA Regional Office.

Each year, a compact disk that includes a new set of AW-501 update worksheets is sent to each participating CRS community for informational purposes. It reflects the community's previously submitted changes, new properties that have been added as a result of recent floods, and changes resulting from other communities' updates. Except during cycle

Repetitive Flood Loss Properties

In the United States there are over 160,000 **repetitive loss properties**, i.e., properties that have had two or more claims of more than \$1,000 paid by the NFIP within any 10-year period since 1978. Although some of these properties have had mitigation measures applied to them, most remain at risk of flooding.

To focus resources on those properties that represent the best opportunities for mitigation, Congress defined a subset called "**Severe Repetitive Loss Properties**" when it passed the Flood Insurance Reform Act of 2004. Severe Repetitive Loss 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.

FEMA is directed by the Act to define Severe Repetitive Loss Property for multi-family buildings. For the purposes of the CRS, the Severe Repetitive Loss Property subset also includes non-residential buildings that meet the same criteria as for 1–4 family properties. The flood insurance policies on these properties are serviced by a separate Special Direct Facility and not by individual Write Your Own insurance companies.

verification and as specified in Section 502.b, a community is not required under the CRS to respond to each year's new list. However, the list can be a valuable planning tool and source of information about the location and extent of flooding within the community. Communities are encouraged to submit any known updates every year.

501.c. Updating the List

As part of its application and cycle verification obligations, the community must review the list for accuracy, for correct addresses, to determine whether the properties are actually in the community's corporate limits, and to determine whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding. The result of this review is recorded on a Repetitive Loss Update Worksheet (AW-501). See the example in Figure 500-1.

A community with repetitive losses must sign the Repetitive Loss List Community Certification, CC-RL, certifying that each address has been checked (see the example in Figure 500-2). If there are updates, the submittal must include corrected Repetitive Loss Update Worksheets (AW-501) with any required supporting documentation. If no updates are needed, only the CC-RL is submitted. The CC-RL can found in Appendix E.

This review is a minimum requirement for participation in the CRS. If the community does not conduct the review of the list at cycle verification, it will lose its CRS credit for addressing its repetitive loss properties, which can result in a reversion to a Class 10.

The community must note the following situations in which the form should be updated:

- The property is not located in the community's jurisdiction. The property may be outside the community's corporate limits, it may be in another city, or it may have been annexed by another community. If it can be determined in which community the property belongs, the property will be reassigned to the correct community. If a property is not in the community, it will not be reassigned unless the community in which the property does belong can be definitely identified.
- There was an error in the repetitive loss data base, such as a duplicate listing or an incorrect address.
- The property has subsequently been protected from the types of events that caused the losses. Buildings that have been acquired, relocated, retrofitted, or otherwise protected from the types of frequent floods that caused the past damage are not counted in determining the community's CRS requirements.
- The property is protected from damage by the base flood shown on the current Flood Insurance Rate Map (FIRM). For example, the community may demonstrate that the building is elevated or floodproofed above the base flood elevation but was flooded by a higher level. If the property is outside the Special Flood Hazard Area (SFHA), the community may show that all of the repetitive losses were caused by events with recurrence intervals of over 100 years (e.g., two 200-year storms).

Federal Emergency Management Agency National Flood Insurance Program NFIP REPETITIVE LOSS UPDATE WORKSHEET (AW-501)		OMB #1660-0022 EXPIRES Sept 30, 2013	
THE INFORMATION ON THE FORM IS BASED ON CLAIMS ON OR BEFORE 01/31/2011			
REPETITIVE LOSS NUMBER: 0987654			
Internal Use Only		<input type="checkbox"/> A	<input type="checkbox"/> N/A
NFIP Community Name: BALDWIN COUNTY*			CID#: 015000
Local Property Identifier: 56-09-29-0-999-000			
Current Property Address -----		Previous Property Address/Community ID# -----	
12345 MEMORY LANE FAIRHOPE AL 365325963			
Last Claimant:			
Insured: YES		Named Insured: ELMER FLOOD	
Dates of Losses:		Total Number of Losses for Property: 2	
20040916	19980927		
REQUESTED UPDATES MARK ALL UPDATES BELOW THAT APPLY (IMPORTANT - SEE INSTRUCTIONS)			
1. INFORMATION PROVIDED NOT SUFFICIENT TO IDENTIFY PROPERTY. Choose this update if all attempts to locate the property fail. Please describe the steps you took to locate the property in the comments section below.			
2. COSMETIC CHANGES REQUIRED TO THE ADDRESS: Update the address shown above and/or add your local alternative property identifier such as a Tax Assessor #.			
3. PROPERTY NOT IN OUR COMMUNITY OR JURISDICTION: Choose this update if you have positively determined that the property shown is not located in your community. Please provide the correct NFIP community name and if known the NFIP Community ID Number. If available, please attach a map showing the property location. ASSIGN TO NFIP COMMUNITY NAME: _____ NFIP COMMUNITY ID # _____			
4. <input checked="" type="checkbox"/> FLOOD PROTECTION PROVIDED. Choose this update if some type of structural intervention has occurred to the building, property or the source of flooding that protects the building from future events similar to those that occurred in the past. The update must be supported by documentation such as an Elevation Certificate and the Mitigation action and funding information below must be provided. Mitigation Action 1.) F Source of Primary Mitigation Funding 3.) Q Secondary Source of Funding 3.) W			
5. NO BUILDING ON PROPERTY. Choose this update only if the property in question can be positively identified as the site of the previously flooded building and documentation is available to support that an insurable building no longer exists at this site. The update must be supported by documentation such as a Demolition or Relocation Permit and the Mitigation action and funding information below must be provided. Mitigation Action 2.) Source of Primary Mitigation Funding 3.) Secondary Source of Funding 3.) See Appropriate Mitigation Action and Funding Codes			
6. DUPLICATE LISTING WITH RL NUMBER: _____ COMBINE AS ONE LISTING. Choose this update to identify two or more separate listings that are for the same building. List all other RL numbers that are duplicates to this property. Please indicate which address shown is the correct address to use.			
7. HISTORIC BUILDING: Choose this update if you know the building is or would be eligible to be listed on a State or National Historic Registry.			
COMMENTS SECTION: _____ Previously updated - this property is no longer considered a RL property _____ Updated as - Flood protection provided - on 11/05/2009 _____			
A signed RL Transmittal Sheet must accompany this form for approval of the update!			
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Figure 500-1. An example of an AW-501.

[NOTE: This address is fictitious. The Privacy Act prohibits publication of a real AW-501.]

OMB No. xxxxxxxxx
Expires: xxxxxxxxx

Community _____ State _____ CID _____

501 The Repetitive Loss List

(See Section 501 in the *CRS Coordinator's Manual*).

___ We have reviewed the repetitive loss list dated _____, 20____, and [check one]
 ___ Attached are updated Repetitive Loss Update Certifications, AW-501; OR
 ___ There are no changes to FEMA's repetitive loss list.

As the current CRS Coordinator for _____ [community name], I have examined the repetitive loss data provided for each of our _____ [number] assigned repetitive loss properties. For each property in need of update, I have attached an AW-501 that reflects the current and accurate address, the correct National Flood Insurance Program (NFIP) community identification number, and all known mitigation actions with the primary source of funding noted. To the best of my knowledge and belief, any AW-501 not updated and submitted as part of this application has been checked and is not in need of update at this time.

Signature: _____ (Community CRS Coordinator)

To facilitate verification, please provide the names of the CRS Coordinator and local repetitive loss contact person, if other than the CRS Coordinator

	CRS Coordinator	Repetitive Loss Contact
Name		
Title		
Phone		
Fax		
Address		
E-mail		

Comments:

Community Certifications
CC-RL
Edition: 2013

Figure 500-2. The Repetitive Loss List Community Certification (CC-RL).

502 Repetitive Loss Category

Every CRS community with one or more unmitigated repetitive loss property on FEMA's current list must keep the list updated and submit a Repetitive Loss List Community Certification (CC-RL) at each verification visit.

Additional requirements depend on the community's repetitive loss category, which is determined by the number of repetitive loss properties without mitigation measures AFTER the community has updated the repetitive loss property information and submitted it for approval. Properties that have been mitigated, that are shown to be in another community, that are not currently insured, or that are documented as impossible to identify and locate in the community are not counted when determining the repetitive loss category.

502.a. The Categories

For CRS purposes, there are three categories of repetitive loss communities based on the number of properties on the UPDATED repetitive loss list (i.e., after the changes and updates have been reported and accepted by FEMA):

- (1) Category A: A community that has no repetitive loss properties, or whose repetitive loss properties all have been mitigated. A Category A community has no special requirements except to submit information to update its repetitive loss list, as needed.
- (2) Category B: A community with at least one, but fewer than 10, repetitive loss properties that have not been mitigated. At each verification visit, a Category B community must
 - (a) Prepare a map of the repetitive loss area(s) (see Section 503),
 - (b) Review and describe its repetitive loss problem,
 - (c) Prepare a list of the addresses of all properties with insurable buildings in those areas, and
 - (d) Undertake an annual outreach project to those addresses (see Section 504). A copy of the outreach project is submitted with each year's recertification.
- (3) Category C: A community with 10 or more repetitive loss properties that have not been mitigated. A Category C community must
 - (a) Do the same things as a Category B community, AND
 - (b) Prepare a floodplain management plan or area analyses for its repetitive loss area(s). The plan and area analysis requirements are explained in Activity 510 (Floodplain Management Planning).

502.b. Effective Dates

A community's repetitive loss category may change over time as a result of flood damage reduction measures implemented by the community, floods that add new insurance losses to the FEMA list, or data updates. A CRS community has no immediate need to take action as a result of a change in its repetitive loss category except as follows:

- (1) When it applies for or modifies its credit for Activity 510 (Floodplain Management Planning);
- (2) When it submits a modification that will result in an increase in its CRS classification; and
- (3) When it is slated for a complete cycle verification of its program.

The last two situations are explained in more detail in Sections 214 and 232. They require that a community submit documentation for all of its activities, including Activity 510.

If a community becomes a Category B community during the year of its cycle verification (see Section 232), it must begin the required outreach project during the following year.

If a community becomes a Category C community during the year of its cycle verification, it has until October 1 of the following year to prepare to adopt the required floodplain management plan or area analyses for its repetitive loss areas. (However, all updates to its repetitive loss list must be submitted with the rest of the cycle verification materials.)

503 Repetitive Loss Areas

At each verification visit, a category B or C community must submit

- (1) AW-501s (if needed);
- (2) A signed CC-RL;
- (3) A map of its repetitive loss areas. The repetitive loss areas must include the properties on the repetitive loss list obtained from FEMA and all nearby properties with the same or similar flooding conditions. The map is needed for the outreach project described in the next section and for planning purposes in Activity 510 (Floodplain Management Planning);
- (4) A description of the cause(s) of the repetitive flooding; and
- (5) A list of the addresses of all properties with insurable buildings in the repetitive loss area(s) and the number of buildings in the repetitive loss area(s), bRLA.

503.a. The Map

The community must plot all the properties on FEMA’s repetitive loss list and define all repetitive loss areas. In some cases, such as those in which the address consists of a rural route or box number, a property will be unplottable. However, local officials can often identify a property by the name of the insured, especially if the last flood was recent. All that is needed is for the general area of the property to be located, e.g., the 400 block of a street.

The community then defines its repetitive loss AREAS. The repetitive loss areas include buildings on FEMA’s list and nearby buildings that were subject to the same flood hazard. It is important to note that the only reason a property appears on FEMA’s list is because the structure had flood insurance and received two or more claims of at least \$1,000 during any given 10-year period. These properties are merely representative of the community’s overall repetitive flooding problem.

Other structures near the ones listed by FEMA may have been uninsured during the floods, may have had single flood insurance claims, or may have had multiple claims under different policies that the system did not recognize as being the same repetitively flooded address. From a community perspective, it is not fair to single out those properties that happen to be on FEMA’s list. All properties with the same exposure to repeated flood damage should be addressed.

There is a separate handout, *Mapping Repetitive Loss Areas*, with further instructions on how to map a repetitive loss area that includes both the properties on FEMA’s list and neighboring properties with the same exposure to repetitive flooding.

The Privacy Act

Flood insurance data on private property, including repetitive loss properties, are subject to the Privacy Act. Information such as the names of people and addresses of properties that have received flood insurance claims and the amounts of such claims MAY NOT be released to the public. Such information should be marked “For internal use only. Protected by the Privacy Act of 1974.”

Generic information, such as total claim payments for an area or data not connected to a particular property MAY be made public.

For example, a community may publish a map showing a repetitive loss area or a list of addresses in that area, provided that it does not show which individual addresses or parcels received flood insurance claim payments.

503.b. Causes of Repetitive Flooding

Once the areas are determined, the community can summarize what caused the repetitive flooding. This can be one or two sentences, such as “overbank flooding in May 1994 and June 2001” or “The drainage ditch was built to carry smaller flows. Upstream development has increased runoff and heavy storms overload the ditch roughly every other year.” See also Chapter 7 of FEMA-511, *Reducing Damage from Localized Flooding*.

503.c. Address List and Building Count

From the repetitive loss area map, the community must prepare an address list of all parcels with insurable buildings in those areas. For CRS purposes, an “insurable building” is defined in Section 301. This list has two purposes: it will be used for the outreach project and it will determine the number of buildings in the community’s repetitive loss areas.

The number of buildings currently in the community’s repetitive loss areas is represented by the variable bRLA. This variable is also used in the impact adjustment for repetitive loss area analyses in Section 512. It should not be confused with bRL (number of properties on the FEMA repetitive loss list) in Activity 520, Acquisition and Relocation.

504 Repetitive Loss Area Outreach Project

A Category B or C community must implement an annual outreach project to the properties in the mapped repetitive loss areas that have insurable buildings, and include a copy of the project with its application and annual recertification.

The outreach project must advise the recipient of four things:

- (1) That the property is in or near an area subject to flooding;
- (2) What property protection measures are appropriate for the flood situation;
- (3) What sources of financial assistance may be available for property protection measures; and
- (4) Basic facts about flood insurance.

The outreach project must be delivered to all properties in the repetitive loss AREAS, not just the properties on the FEMA list. This may be done in one of two ways:

- (1) An outreach project that is distributed each year to the properties in the repetitive loss areas that have insurable buildings. This project may also be submitted for credit as a targeted outreach project under Activity 330.
- (2) An annual outreach project developed as part of a Program for Public Information (PPI) credited under Activity 330. The PPI Committee may conclude that there are more effective ways to inform repetitive loss area residents than mailing a notice once a year. The PPI may use a different approach, such as neighborhood meetings, provided the PPI document identifies the target audience for the service and discusses the best way to reach that audience. For continued PPI credit, the committee must annually evaluate the effectiveness of the outreach projects and revise them as needed.

An example project appears in Figure 500-3. More information on outreach projects can be found in Activity 330 (Outreach Projects).

More information on sources of financial assistance can be found in Section 505.

Dear Resident:

You have received this letter because your property is in an area that has been flooded several times. Our community is concerned about repetitive flooding and has an active program to help you protect yourself and your property from future flooding, but here are some things you can do:

1. Check with the Building Department on the extent of past flooding in your area. Department staff can tell you about the causes of repetitive flooding, what the City is doing about it, and what would be an appropriate flood protection level. The staff can visit your property to discuss flood protection alternatives.
2. Prepare for flooding by doing the following:
 - Know how to shut off the electricity and gas to your house when a flood comes.
 - Make a list of emergency numbers and identify a safe place to go.
 - Make a household inventory, especially of basement contents.
 - Put insurance policies, valuable papers, medicine, etc., in a safe place.
 - Collect and put cleaning supplies, camera, waterproof boots, etc., in a handy place.
 - Develop a disaster response plan. See the Red Cross' website at www.redcross.org for information about preparing your home and family for a disaster.
 - Get a copy of *Repairing Your Flooded Home*. We have copies at the Public Works Department or it can be found on the Red Cross' website, too.
3. Consider some permanent flood protection measures.
 - Mark your fuse or breaker box to show the circuits to the floodable areas. Turning off the power to the basement before a flood can reduce property damage and save lives.
 - Consider elevating your house above flood levels.
 - Check your building for water entry points, such as basement windows, the basement stairwell, doors, and dryer vents. These can be protected with low walls or temporary shields.
 - Install a floor drain plug, standpipe, overhead sewer, or sewer backup valve to prevent sewer backup flooding.
 - More information can be found at FEMA's website, www.ready.gov/floods.
 - Note that some flood protection measures may need a building permit and others may not be safe for your type of building, so be sure to talk to the Building Department.

Figure 500-3. An example of an outreach project to a repetitive flood loss area.

4. Talk to the Building Department for information on financial assistance.
 - The City administers a flood protection rebate program that will pay 25% of approved projects, up to a total of \$2,500. This program has funded low floodwalls, overhead sewers, sewer backup valves, and relocation of utilities to higher levels.
 - If you are interested in elevating your building above the flood level or selling it to the City, we may apply for a Federal grant to cover 75% of the cost.
 - Get a flood insurance policy – it will help pay for repairs after a flood and, in some cases, it will help pay the costs of elevating a substantially damaged building.
5. Get a flood insurance policy.
 - Homeowner’s insurance policies do not cover damage from floods. However, because our community participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal government and is available to everyone, even properties that have been flooded. Because our community participates in the Community Rating System, you will receive a reduction in the insurance premium.
 - Because your area is not mapped as a Special Flood Hazard Area, you may qualify for a lower-cost Preferred Risk Policy.
 - Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building’s structure and not the contents. During the kind of flooding that happens in your area, there is usually more damage to the furniture and contents than there is to the structure. Be sure you have contents coverage.
 - Don’t wait for the next flood to buy insurance protection. In most cases, there is a 30-day waiting period before National Flood Insurance Program coverage takes effect.
 - Contact your insurance agent for more information on rates and coverage.

Figure 500-3 (cont.). An example of an outreach project to a repetitive flood loss area.

505 Repetitive Loss Mitigation Activities

Sections 501–504 describe the minimum CRS participation requirements for repetitive loss communities. The requirements focus on updating repetitive loss records, identifying the extent of the problem, and providing basic information to owners of properties in the repetitive loss area(s).

The CRS encourages communities to do more to reduce their repetitive flooding problems. Additional credit points are provided in the following activities for actions that address repetitive loss properties or repetitive loss areas:

- Activity 360 (Flood Protection Assistance)—Credit is provided for technical assistance on property protection. Many shallow repetitive flooding problems can be mitigated with a low-cost project paid for by the owner, so technical assistance can sometimes go far to reduce repetitive losses.

- Activity 510 (Floodplain Management Planning)—Credit is given for conducting an analysis of the repetitive loss areas and determining appropriate mitigation measures for these areas (Section 512.b).
- Activity 520 (Acquisition and Relocation)—Bonus points are provided for acquiring or otherwise removing repetitive loss properties, with larger bonuses for Severe Repetitive Loss Properties (Section 522.b and 522.c).
- Activity 530 (Flood Protection)—Bonus points are provided for retrofitting or otherwise protecting repetitive loss properties, with larger bonuses for Severe Repetitive Loss Properties (Section 532.c).

FEMA has several financial assistance programs that can help communities implement some of these activities. There are five programs that can fund acquisition, retrofitting, and other flood protection projects that would qualify for credit under Activities 520 and 530. Some of them can fund a floodplain management plan. All five of them require that an applicant community have a hazard mitigation plan, as described in Activity 510 (Floodplain Management Planning).

All five programs are managed by the state, usually by the emergency management agency. The state may set additional priorities for use of the funds. The latest information on these programs can be found at www.fema.gov/hazard-mitigation-assistance.

There are other sources of financial assistance:

- Community Development Block Grants are provided to larger cities and counties; smaller communities can apply to the state community development agency.
- The U.S. Army Corps of Engineers will support elevation and flood control projects as part of a larger flood protection program.
- The U.S. Department of Agriculture’s Natural Resources Conservation Service can help fund retrofitting and local flood control projects in smaller watersheds.
- Flood insurance claims can include Increased Cost of Compliance funding. This provision provides additional coverage to help underwrite a flood protection project that is required by code as a condition to rebuild the flooded building. It can also be used to help pay the non-federal portion of a cost-shared retrofitting project.
- Many states and regional or county flood control districts have their own funding programs or will help with the non-federal cost share of a federal program.
- Many communities have developed financial assistance programs, especially for sewer backup and local drainage problems, where mitigation projects may be relatively inexpensive.

More information on financial assistance programs to protect individual buildings can be found in *Local Flood Proofing Programs*, U.S. Army Corps of Engineers, 2005, available at www.usace.army.mil/Portals/2/docs/civilworks/Project%20Planning/nfpc/Local%20Flood%20Proofing%20Programs%202005.pdf.

506 National Flood Insurance Reform Act of 1994

This Act requires that, “if a community has received mitigation assistance under Section 1366 [the Flood Mitigation Assistance Program], the credits shall be phased in a manner, determined by the Director, to recover the amount of such assistance provided for the community.”

In general, this is limited to Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection), the two activities most likely to be funded. Because the Flood Mitigation Assistance Program provides a 75% grant, a community will receive 25% of the credit for protecting a building under Activities 520 and 530.

NOTE: This is a statutory requirement that only applies to the Flood Mitigation Assistance program, not to other FEMA-funded financial assistance programs.

Example 506-1.

A community applies for credit under Activity 520 (Acquisition and Relocation) for having removed 20 buildings from the floodplain. Five of those buildings were acquired with a 75% grant from the Flood Mitigation Assistance Program.

The ISO/CRS Specialist will calculate the credit based on 25% credit for the five buildings and full credit for the other 15. If the community can demonstrate that there was a higher local cost-share, the points will be adjusted accordingly.

507 Compliance with Provisions for Environmental and Historic Preservation

Federal actions and undertakings, including ongoing programs, must comply with applicable federal environmental and historic preservation laws, implementing regulations, and executive orders. The CRS is a federal program and FEMA has identified certain building or land-altering activities that must meet this requirement if they are to be considered for CRS credit. These include projects undertaken under Activity 520 (Acquisition and Relocation), Activity 530 (Flood Protection), Activity 540 (Drainage System Maintenance), and Activity 620 (Levees).

The level of environmental and historic preservation compliance and documentation required for each project is determined by the type of project and the source of its funding. For CRS purposes, a project falls into one of these two categories:

- Projects funded (in whole or in part) by a federal agency, and
- Projects funded by a state and/or local government.

NOTE: Using any amount of federal or FEMA funding (including using it as a match for a locally sponsored project) has the effect of bringing that project into the “federally funded” category. For any such project, therefore, all of the federal environmental and historic preservation requirements must be met.

Self certification is provided through the completion of Community Certifications of Compliance with Environmental and Historic Preservation Requirements (CC-EHPs). The CC-EHP forms can be found in Appendix F, downloaded from www.CRSresources.org, or requested from the ISO/CRS Specialist.

- Certifications are required for all projects in Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection) that were permitted or initiated after the implementation of the 2013 *Coordinator’s Manual*.
- Certifications are required at each verification visit for the ongoing maintenance programs credited under Activity 540 (Drainage System Maintenance) and Activity 620 (Levee Maintenance).
- Projects funded by FEMA are considered to meet FEMA’s environmental and historic preservation compliance requirements. A summary of such projects needs to be included in the Community Certifications.

If a community is not able to provide the information needed to certify that compliance occurred before implementation of the project or activity, then CRS credit will not be provided for that project or for that element of a CRS Activity.

507.a. Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection)

The CC-EHPs, certifying compliance with the appropriate requirements, are required for all projects credited under Activity 520 or Activity 530 that were implemented AFTER the effective date of the 2013 *Coordinator’s Manual*. They are not required for projects that were implemented before the 2013 *Coordinator’s Manual* became effective, including projects that received CRS credit under an earlier *Coordinator’s Manual*.

Projects funded in whole or in part by FEMA are considered to have already complied with FEMA’s environmental and historic preservation requirements. A summary description of these projects needs to be documented in the CC-EHPs.

507.b. Activity 540 (Drainage System Maintenance) and Activity 620 (Levees)

The CC-EHPs certifying compliance with the appropriate requirements must be submitted at the time that CRS credit is requested for projects under Activities 540 or 620. This includes the first time that Activity 540 or Activity 620 credit is requested as well as each subsequent verification visit at which continued credit is requested.

507.c. More Information on Environmental Compliance

The CC-EHPs consist of CC-520EHP, CC-530EHP, CC-540EHP, and CC-620EHP. They can be found in Appendix F, downloaded from www.CRSresources.org, or requested from the ISO/CRS Specialist.

A matrix of the various requirements for environmental and historic preservation compliance as they relate to CRS-credited projects is posted at www.CRSresources.org/500.

Figure 500-4 summarizes the applicable federal requirements for environmental and historic preservation. For more information about FEMA's preservation policies, visit www.fema.gov/environmental-planning-and-historic-preservation-program.

Figure 500-5 gives brief descriptions of applicable federal environmental laws and executive orders, along with links to websites that offer more information.

Communities are encouraged to learn more about federal, state, and other programs for the protection of environmental, cultural, and historic resources. Many of the principles and techniques used by such programs can be incorporated into the community's floodplain management efforts, and thereby help to reduce flood losses and sustain the natural functions of floodprone areas.

It is FEMA's policy to act with care to ensure that its disaster response and recovery, mitigation and preparedness responsibilities are carried out in a manner that is consistent with all Federal environmental and historic preservation policies and laws. FEMA uses all practical means and measures to protect, restore and enhance the quality of the environment, to avoid or minimize adverse impacts to the environment, and to attain the objectives of

- Achieving use of the environment without degradation or undesirable and unintended consequences;
- Preserving historic, cultural, and natural aspects of national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieving a balance between resource use and development within the sustained carrying capacity of the ecosystem involved; and
- Enhancing the quality of renewable resources and working toward the maximum attainable recycling of depletable resources.

Source: www.fema.gov/environmental-planning-and-historic-preservation-program

Figure 500-4. Summary of FEMA's policy on environmental and historic preservation.

Archeological & Historic Preservation Act

Requires federal agencies to take into account the preservation of cultural resources that may be damaged by federal or federally authorized construction activities. Requires that the U.S. Secretary of Interior be notified when unanticipated archeological materials are discovered during construction of a federal undertaking.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, National Park Service

For more information: www.nps.gov/archeology/tools/Laws/ahpa.htm
www.achp.gov/nhpa.html

Clean Water Act, Section 402

Limits the quantity of pollutants that may be discharged into surface waters. Includes permits for municipal separate storm sewer discharges. National Pollution Discharge Elimination System (NPDES) discharge permits may be required from the U.S. Environmental Protection Agency or the state.

Administered by: State agency for water quality in states with delegated regulatory responsibility; otherwise, U.S. Environmental Protection Agency

For more information: <http://water.epa.gov/lawsregs/guidance/wetlands/section402.cfm>

Clean Water Act, Section 404 (Nationwide Permit 13)

Requires a permit for bank stabilization projects less than 500 feet long and being implemented solely for erosion protection.

Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

For more information: www.usace.army.mil/ (see “Obtain a permit—regulatory permits”),
http://water.epa.gov/lawsregs/lawsguidance/cwa/wetlands/regs_index.cfm

Clean Water Act, Section 404 (Section 404 permit)

Establishes permit requirements for actions to discharge dredge or fill material into waters of the United States, including wetlands. Includes fill for development and for water resources projects such as dams and levees.

Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

For more information: www.usace.army.mil/ (see “Obtain a permit—regulatory permits”),
http://water.epa.gov/lawsregs/lawsguidance/cwa/wetlands/regs_index.cfm
www.fws.gov/wetlands

Coastal Barrier Resources Act

Prohibits new federal expenditures or financial assistance for development within an established unit or zone of the Coastal Barrier Resources System. Protects ecologically sensitive coastal barriers along the U.S. Atlantic, Gulf, and Great Lakes coasts.

Administered by: U.S. Fish & Wildlife Service field offices

For more information: www.fws.gov/CBRA

(continued on next page)

Figure 500-5. Federal environmental laws and executive orders that may apply to some CRS-credited activities.

Coastal Zone Management Act

Requires federal agencies conducting or supporting projects affecting the coastal zone to conduct and support those activities to the maximum extent possible in a manner consistent with the state's approved coastal management plan. Requires a "consistency determination" for federal actions. Action-taking entities are required to obtain a permit from the state's lead coastal resources management agency or office.

Administered by: State's lead coastal management agency, National Oceanic and Atmospheric Administration

For more information: <http://coastalmanagement.noaa.gov/programs/czm.html>

Endangered Species Act

Prevents or requires modification of a project that could jeopardize endangered or threatened species and/or their habitat. Section 7 requires consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service, as applicable.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service, applicable state agencies for state-protected species and their habitat

For more information: www.fws.gov/endangered/
www.fws.gov/endangered/species
www.nmfs.noaa.gov/pr/permits
www.nmfs.noaa.gov/pr/permits/esa_permits.htm

Executive Order 11988—Floodplain Management

Requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Requires federal agencies to avoid the direct and indirect support of floodplain development where there is a practicable alternative.

Administered by: Federal Emergency Management Agency

For more information: www.fema.gov/plan/ehp/ehplaws/eo11988.shtm

Executive Order 11990—Protection of Wetlands

Requires federal agencies to minimize, to the fullest extent possible, the destruction, loss, or degradation of wetlands. Requires federal agencies to preserve and enhance the natural and beneficial values of wetlands.

Administered by: U.S. Fish and Wildlife Service

For more information: www.fws.gov/wetlands

Executive Order 12898—Environmental Justice for Low Income and Minority Populations

Requires fair treatment of all ethnic and income groups regarding public health and environmental effects from federal agency laws, regulations, policies, programs, and projects. Requires federal agencies to address disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Administered by: All federal agencies

(continued on next page)

Figure 500-5 (cont.). Federal environmental laws and executive orders that may apply to some CRS-credited activities.

Farmlands Protection Policy Act

Requires federal agencies to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses.

Administered by: Natural Resources Conservation Service state office, state agencies for soils (soil and water conservation districts)

For more information: www.nrcs.usda.gov/programs/fppa/

Fish and Wildlife Coordination Act

Requires federal agencies to consider the effects that projects may have on fish and wildlife resources, take action to prevent loss or damage to these resources, and support the development or improvement of these resources. Protects fish and wildlife when federal actions result in the control or modification of natural streams, waterways, water bodies, or associated wetlands.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service

For more information: www.fws.gov/habitatconservation/fwca.html
www.habitat.noaa.gov/protection

National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to take into account the impact of their actions on historic properties listed (or eligible for listing) on the National Register of Historic Places.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service

For more information: www.achp.gov/overview.html
www.achp.gov/nhpa.html
www.cr.nps.gov/nr/

Rivers and Harbors Act,-Section 10

Requires a permit for building any structure in the channel or along the banks of navigable waters of the United States that changes the course, conditions, location, or capacity of those waters.

Administered by: U.S. Army Corps of Engineers

For more information: www.usace.army.mil/
www.uscg.mil/hq/cg5/cg551/

Figure 500-5 (cont.). Federal environmental laws and executive orders that may apply to some CRS-credited activities.

510 FLOODPLAIN MANAGEMENT PLANNING—Summary

Maximum credit: 622 points

512 Elements

- a. **Floodplain management planning (FMP):** 382 points for a community-wide floodplain management plan that follows a 10-step planning process:
 - Step 1. Organize
 - Step 2. Involve the public
 - Step 3. Coordinate
 - Step 4. Assess the hazard
 - Step 5. Assess the problem
 - Step 6. Set goals
 - Step 7. Review possible activities
 - Step 8. Draft an action plan
 - Step 9. Adopt the plan
 - Step 10. Implement, evaluate, revise.
- b. **Repetitive loss area analysis (RLAA):** 140 points for a detailed mitigation plan for a repetitive loss area.
- c. **Natural floodplain functions plan (NFP):** 100 points for adopting plans that protect one or more natural functions within the community's floodplain.

Credit Criteria

Each element has a separate section discussing credit criteria.

Impact Adjustment

The impact adjustments for FMP and RLAA are described in separate sections. There is no impact adjustment for NFP.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

510 FLOODPLAIN MANAGEMENT PLANNING

The OBJECTIVE of this activity is to credit the production of an overall strategy of programs, projects, and measures that will reduce the adverse impact of the hazard on the community and help meet other community needs.

511 Background

Too often flood protection decisions are made quickly, with inadequate or outdated information or without considering all possible mitigation alternatives or the consequences of those alternatives. As a result, the community's resources are not allocated most appropriately, flood problems may not be fully addressed, and natural floodplain functions may suffer.

To remedy this situation, a careful, systematic process of planning is recommended, and may be credited by this activity. The Community Rating System (CRS) does not specify what activities a plan must recommend; rather, it recognizes plans that have been prepared according to the standard planning process explained in this activity.

Benefits: A well-prepared plan will

- Identify existing and future flood-related hazards and their causes;
- Ensure that a comprehensive review of all possible activities and mitigation measures is conducted so that the most appropriate solutions will be implemented to address the hazard;
- Ensure that the recommended activities meet the goals and objectives of the community, are in coordination with land use and comprehensive planning, do not create conflicts with other activities, and are coordinated so that the costs of implementing individual activities are reduced;
- Ensure that the criteria used in community land use and development programs account for the hazards faced by existing and new development;
- Educate residents and property owners about the hazards, loss reduction measures, and the natural and beneficial functions of floodplains;
- Build public and political support for activities and projects that prevent new problems, reduce losses, and protect the natural and beneficial functions of floodplains; and
- Build a constituency that wants to see the plan's recommendations implemented.

Types of plans: This activity credits three kinds of plans:

- Floodplain management planning (FMP): The most credit is for the first element, a community-wide floodplain management plan, but the element can also credit multi-hazard mitigation plans, multi-jurisdictional floodplain management and hazard mitigation plans, and floodplain management plans prepared for the U.S. Army Corps of Engineers.

- Repetitive loss area analyses (RLAA): The second element credits more detailed, site-specific plans to reduce flood losses in repetitively flooded areas. It has a narrower scope than a floodplain management plan, and receives fewer credit points.
- Natural floodplain functions plan (NFP): The third element provides credit for plans that address natural floodplain functions in the community.

A Category C repetitive loss community (defined in Section 502) must prepare either a FPM or RLAA area analysis that covers at least all of its repetitive loss areas.

Implementation: Credit is not provided for simply preparing a plan. Continued credit is dependent upon plan implementation. To maintain the credit for Activity 510, every year the community must evaluate its progress toward implementing the projects and programs in the plan, area analysis, or natural floodplain functions plan, and submit a report of that evaluation with its annual CRS recertification. It must update the background information and the recommendations in its floodplain management plans and repetitive loss area analyses at least every five years and in its natural floodplain functions plan(s) every 10 years.

Other plans: A plan by another name, such as a post-flood or multi-hazard mitigation plan, could receive credit under this activity if it was prepared in accordance with the process explained here. Hazard mitigation plans prepared to qualify for FEMA’s hazard mitigation grants that are accepted by FEMA will receive some credit under this activity.

By their very nature as overall guidance for a community’s program, plans should be coordinated with other plans and programs as well as the activities of other agencies or offices that have authority over the same area. It is recommended that communities also contact state and regional offices and agencies to review their plans and planning criteria. For example, state planning agencies have requirements for some kinds of plans and state emergency management agencies may have additional elements they would like to see included in a mitigation plan.

NOTE: An ordinance is NOT a plan. *An ordinance sets standards for land development and other activities. Planning may include a review of land development standards and procedures, but it should also cover a much broader range of activities, as noted in Figure 510-4.*

A separate CRS publication, *CRS Credit for Floodplain Management Planning*, has a detailed discussion of the requirements of this section and of multi-hazard mitigation plans, as well as model plans and CRS credit documentation. Communities are encouraged to read this and additional FEMA guidance on mitigation planning before beginning their floodplain management planning. These documents can be found at www.CRSresources.org/500.

Class 9 Prerequisite: A Category C repetitive loss community (see Section 502) must receive credit under either Section 511.a, FPM or Section 511.b, RLAA with a plan that covers its repetitive loss areas.

512 Elements

512.a. Floodplain management planning (FMP)

The maximum credit for this element is 382 points.

FMP credit is provided for a community-wide floodplain management plan that was prepared by following a standard planning process. To receive any credit under this activity, the planning process must receive some credit under each of the 10 steps listed below. If the plan was approved by FEMA as a multi-hazard mitigation plan and one step is missing, the mitigation plan may receive credit, but FMP credit will be limited to 50 points. If two steps are missing, there is no credit for a multi-hazard mitigation plan.

For some steps, such as Step 1, the community may show that it implemented at least one of the listed credit items. For other steps, specific items are required as a minimum. Required items are noted with “(REQUIRED)” after them.

FEMA’s multi-hazard mitigation planning regulations pursuant to the Disaster Mitigation Act of 2000 are explained at www.fema.gov/plan/mitplanning. The 10-step CRS planning process is consistent with those regulations, which identify four phases of hazard mitigation planning. The 10 CRS steps are aligned with the four phases of mitigation planning requirements in Table 510-1.

The CRS-credited planning process must follow the 10 steps. Although the plan document must discuss and document all 10 steps, the written plan does not need to be organized by these 10 steps. To document CRS credit, the community must identify where these steps were covered in its plan, using the CRS planning credit activity checklist (see Figure 510-1).

Note: It is recommended that the planner review all state and FEMA planning program guidelines, including the CRS planning credit checklist for Activity 510. Doing so will ensure that the planning effort will meet all state, FEMA, and CRS criteria. It is the community’s option, but with proper planning, one plan document can fulfill the planning criteria of several FEMA and state programs.

Documentation or discussion of all but Steps 3 and 9 must be presented in the plan document. Steps 3 and 9 may be in the plan document or they may be explained in a separate memo from the community or the plan’s author as explained in the documentation section at the end of each step. The community must update the plan at least every five years and document the update by October 1, five years after the plan was adopted.

Table 510-1. Planning steps for mitigation and for the CRS.		
Multi-hazard Mitigation Planning	CRS	Maximum
Phase I – Planning process		
§201.6(c)(1)	1. Organize	15
§201.6(b)(1)	2. Involve the public	120
§201.6(b)(2) & (3)	3. Coordinate	35
Phase II – Risk assessment		
§201.6(c)(2)(i)	4. Assess the hazard	35
§201.6(c)(2)(ii) & (iii)	5. Assess the problem	52
Phase III – Mitigation strategy		
§201.6(c)(3)(i)	6. Set goals	2
§201.6(c)(3)(ii)	7. Review possible activities	35
§201.6(c)(3)(iii)	8. Draft an action plan	60
Phase IV – Plan maintenance		
§201.6(c)(5)	9. Adopt the plan	2
§201.6(c)(4)	10. Implement, evaluate,	26
Total		382

512.a Floodplain management planning (FMP):	
<input checked="" type="checkbox"/>	(1) Attached is the floodplain management or hazard mitigation plan to be credited.
<input checked="" type="checkbox"/>	Check here if the plan was also approved by FEMA as a hazard mitigation plan
<input checked="" type="checkbox"/>	(2) This CRS planning credit worksheet, completed.
CRS Planning Step	Page/Section
Step 1. Organize to prepare the plan	
(a) Involvement of the office responsible for community planning	Ch. 6, p. 6-2
(b) Planning committee of department staff	Ch. 1, p. 1-3
(c) Process or committee formally created by the community's governing board	
<input checked="" type="checkbox"/>	(1) Mark the plan document to show how it was prepared and who was involved in the planning process. Show which people or offices implement which of the six mitigation categories.
<input type="checkbox"/>	(2) [For item 1.(c)] Attach a copy of the governing body's action or resolution.

Figure 510-1. An excerpt from a floodplain management planning credit checklist.

Credit Points

FMP = the total of points credited for Step 1 through Step 10, up to the maximum of 382 points

There are no credit formulae for this activity. The credits for each step are simply added together.

Note that the points listed (Step 1 to Step 10) are maximum possible points. The ISO/CRS Technical Reviewer may determine that one or more items do not warrant full credit.

Step 1. Organize to prepare the plan

The credit for this step is based on how the community organizes to prepare its floodplain management plan.

Credit Points

Credit for Step 1 is the total of the following points. (Maximum credit: 15 points)

- (a) 4 points, if the office responsible for the community's land use and comprehensive planning is actively involved in the floodplain management planning process. The "office" may be the community's planning or community development department, a consulting firm, or a regional planning agency, provided that it performs regular land use or comprehensive planning duties for the community. This office is usually not the floodplain management or mitigation planner or consultant, because the intention of this credit is to incorporate the floodplain management or mitigation plan into the rest of the community's planning activities. "Actively involved" means that staff regularly attend meetings, assist in the coordination (Step 3), and either write or review draft sections of the plan.
- (b) 9 points, if the planning process is conducted through a committee composed of staff from those community departments that implement or have expertise in the activities that will be reviewed in Step 7. One point is provided for each office represented. Divisions of departments can be counted as separate offices. For smaller communities with fewer departments, full credit is provided if the committee has representation from all offices with expertise in all six categories of activities credited in Step 7.

Step 7 Categories

- Preventive measures (e.g., codes)
- Property protection (e.g., elevation)
- Natural resource protection
- Emergency services
- Structural flood control projects
- Public Information

Also see Figure 510-4.

A planning committee is strongly recommended. By involving those who can contribute and will be most affected when the recommendations are carried out, the community will get a more realistic product that will have a much better chance of being adopted

and implemented. Community departments that could be represented on the committee include, but are not limited to

- Building department/code enforcement,
- Engineering,
- Land use planning/zoning,
- Public works,
- Emergency management/public safety,
- Public information,
- Environmental protection/public health,
- Parks/recreation,
- A city manager or council member, and
- Housing/community development.

If the planning committee includes representatives from the public and other stakeholders (with no attachment to local government), additional credit is provided in Step 2. Note that there is extra credit in Step 10 if the committee continues to meet after the plan is adopted in order to evaluate progress and recommend changes.

No credit is provided for the creation of a planning committee if the committee only meets once or twice. It must meet a sufficient number of times to involve the members in the following key steps of the planning process (e.g., at least one meeting on each step):

- Step 4. Assess the hazard,
- Step 5. Assess the problem,
- Step 6. Set goals,
- Step 7. Review possible activities, and
- Step 8. Draft an action plan.

If the community wants credit for participating in a multi-jurisdictional floodplain management or hazard mitigation planning committee,

- The community must send at least two representatives to the planning committee;
- At least half of the community's representatives must attend all the meetings of the planning committee. In effect, there must be a quorum from each community. Remote attendance, e.g., via a webinar that allows for everyone to talk, is permissible; and
- CRS credit for the multi-jurisdictional planning committee will be based on the representation from offices that implement the activities in Step 7.

Examples

- a. A community has a planning committee with representatives from its planning, zoning, building, emergency management, code enforcement, and public works departments, as well as the city manager's public information person. There is no one at the community level that deals with natural floodplain functions. The community's committee would receive six points, one for each representative.
 - b. A county is preparing a multi-jurisdictional plan for the county and 10 participating cities. This planning committee has 30 members, including two from each city. Among the members are representatives of all six Step 7 categories, e.g., a city engineer, a city public works person, the county planner, and the county soil and water conservation district. The county's committee would receive the full nine points, provided there was a quorum from each community seeking credit.
- (c) 2 points, if the planning process and/or the committee are formally created or recognized by action of the community's governing body.

Two points are provided if the community's governing body (e.g., the city council) formally recognizes the planning process. The preferred method is a formal resolution that designates who is responsible for preparing the plan and specifies a completion deadline. If a committee credited under Step 1(b) or 2(a) is used, the resolution should identify the members and the chair (or how the chair is selected) and how staff support is provided.

If a community participates in a multi-jurisdictional committee, its governing body must act in order for the community to receive this credit. A city will not receive this credit for a county council resolution. Conversely, a city can receive this credit even if there is no county credit.

Step 2. Involve the public

The planning process must include an opportunity for the public to comment on the plan during its development and before its approval. Members of the public may be part of the planning committee created under Step 1 or they may be organized as a separate committee.

For this credit, the term “public” includes residents, businesses, property owners, and tenants in the floodplain and other known hazard areas as well as other stakeholders in the community, such as developers and contractors, civic groups, environmental organizations, academia, non-profit organizations, major employers, and staff from other governmental agencies, such as a levee district, housing authority, Natural Resources Conservation Service, or the National Weather Service.

Members of an advisory body to the community that does not have any regulatory authority, such as a stormwater advisory board, can be counted as representatives of the public. Community employees and members of a regulatory body, such as a zoning board of appeals that makes final decisions, are not considered “public” or stakeholders and are counted as representatives of the community departments credited under Step 1(b).

As with staff, involving the public and stakeholders brings them fully into the planning process, provides input on the viability of options being considered, and helps them to become concerned about the outcome. The largest number of points is provided for Step 2(a) because a planning committee with public membership has the following advantages:

- The committee can be a forum to both educate the public and also provide a means for public input into the plan.
- The participants recognize that they are involved and will be more willing to commit themselves to the process.
- The participants can do some of the work, especially data gathering, thereby reducing the overall cost of preparing the plan.
- A committee can be an effective forum for discussing alternatives, debating goals and objectives, and matching the technical requirements of a program to local situations.
- The committee members will provide information on the plan and process to their respective constituencies.
- The participants gain a feeling of “ownership” of the plan and its recommendations, which helps build public support for it.
- Committee members form a constituency that will have a stake in ensuring that the plan is implemented.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

The most important partners to assist in the plan development are already within your community: local government officials, community planning and design professionals, business leaders, civic and volunteer groups, emergency services personnel, and interested residents.

. . . Ensuring that your team has an equitable and diverse representation will enhance your planning efforts and help build support for mitigation.

—*Planning for a Sustainable Future*, FEMA-364

Credit Points

The credit for this step is the total of the following points based on how the community involves the public during the planning process. (Maximum credit: 120 points)

- (a) Up to 60 points, if the planning process is conducted through a planning committee that includes members of the public and meets the following criteria:
 - (1) If the committee includes community staff (e.g., the planning committee credited under Step 1(b)), then at least one-half of the members must be representatives of the public or stakeholders for full credit. The credit is prorated for lower levels of public or stakeholder representation. Note that receiving 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities and item (a) is one-half of the credit for Step 2.
 - (2) It must meet a sufficient number of times to involve the members in the key steps of the planning process, i.e., it must meet the same meeting criteria specified in Step 1(b).
 - (3) All meetings must be open to the public and the meeting schedule must be publicly posted (e.g., on a website).
 - (4) If the community wants credit for participating in a multi-jurisdictional floodplain management or hazard mitigation planning committee, it must meet the criteria specified in Step 1(b).
 - (5) The formalities of organizing and naming the committee are not as important as the membership and the ability of all members to participate. For example, a community may augment an existing committee with an advisory body of stakeholders. Such an arrangement would be credited, provided the stakeholders were treated as full committee members during the meetings, i.e., they can speak up, vote, and receive all the materials that regular members do.

Note that this planning committee can be (and it is recommended that it be) the same committee that prepares a Program for Public Information for credit under Activity 330 (Outreach Projects). The floodplain management plan document can also be or include the Program for Public Information document and/or the flood insurance coverage improvement plan credited under Activity 370 (Flood Insurance Promotion).

There is extra credit in Step 10 if the committee continues to meet after the plan is adopted in order to evaluate progress and recommend changes, provided that the committee continues to meet the above criteria. Such annual evaluations by a committee are required for some of the credits under Activities 330 and 370.
- (b) 15 points, if one or more public information meetings is held in the affected area(s) within the first two months of the planning process to obtain public input on the natural hazards, problems, and possible solutions. The meetings must be held separately from the planning committee meetings credited in item (1).

The intent of the public meeting(s) is to go out to the people to gather input. At a minimum, it must be separate from regular meetings of the planning committee or the community's governing body. It is recommended that at least one of these public meetings be held in the affected neighborhoods.

- (c) 15 points, for holding one or more public meetings to obtain input on the recommended plan. The meeting(s) must be at the end of the planning process, at least two weeks before submittal of the recommended plan to the community's governing body.

Simply discussing the plan at a regular public meeting of the governing body, just before it is voted on, is not sufficient public input for CRS credit. To receive credit for this item, there must be at least one public meeting at the end of the planning process, at which the plan and its findings and recommendations are explained and people can ask questions and submit their comments for review, consideration, and potential modification of the plan. The CRS does not require public hearings. State and local laws take precedence, however. The community's legal counsel should determine if a public hearing is required.

- (d) 5 points, for each additional public information activity implemented to explain the planning process and encourage input to the planner or planning committee, up to a maximum of 30 points. Examples include, but are not limited to

- A website that explains the planning process and posts the time and place for its meetings, meeting agendas, status reports, and the draft plan, when it is ready for review.
- Conducting a public webcast that explains the planning process and solicits input.
- Questionnaires asking the public for information on their natural hazards, problems, and possible solutions. A questionnaire or survey that is sent to everyone in the floodplain or everyone in the community will receive double credit (10 points).
- Outreach projects, such as those credited in Activity 330 (Outreach Projects), which explain the planning effort and seek comments. These could include brochures, mailers, booths at shopping malls, presentations at civic or neighborhood organizations, etc.

Step 3. Coordinate

Most communities' flood problems have been studied already. There are likely to be existing plans, studies, and reports on flooding that need to be reviewed. There also may be flood protection activities being considered or implemented by other agencies.

This planning step credits incorporating other plans and other agencies' efforts into the floodplain management plan. Other agencies and organizations must be contacted to determine if they have studies, plans, or information pertinent to the floodplain management plan; to determine if their programs or initiatives may affect the community's program; and to see if they could support the community's efforts.

Examples of “other agencies and organizations” include neighboring communities; local, regional, state, and federal agencies; and businesses, colleges, and other private and non-profit organizations affected by the hazards or involved in hazard mitigation or floodplain management.

This credit is for coordinating with other agencies and organizations, particularly those that are not represented on the planning committee credited under Step 1(b) or Step 2(a). No special additional coordination measures are needed for the agencies and organizations on the planning committee, but the planners may want to formally contact the directors and others for the record.

Note that community needs and goals typically are developed during comprehensive planning activities. These goals should be identified in this step, reviewed, and considered during the development of the floodplain management plan. They should be taken into account when the goals for the floodplain management plan are developed in Step 6.

Credit Points

The credit for this step is the total of the following points. To receive credit for this step, the coordination must include item (a). (Maximum credit: 35 points)

- (a) 5 points, if the planning includes a review of existing studies, reports, and technical information and of the community’s needs, goals, and plans for the area. (REQUIRED) Where the information from the existing studies and reports is used in the plan, the source(s) should be referenced.

This review needs to include a review of community needs and goals, past flood studies, disaster damage reports, natural areas plans, and other documents that will provide information for the planning process.

- (b) 30 points, for coordinating with agencies and organizations outside the community’s governmental structure. There is no credit for talking to other departments within the city or county government. For this credit, “coordinate” means to

- Contact the agency or organization and keep a record of the contact (a generic announcement or notice on a website is not sufficient);
- Ask for data or information related to the hazard;
- Ask if the agency or organization is doing anything that might affect flooding or properties in flood-prone areas; and
- Offer the agency or organization an opportunity to be involved in the planning effort, such as by attending a committee meeting or commenting on the draft plan.

One point is provided for each agency or organization that is contacted.

Two points are provided for meeting or having a telephone conversation with the agency or organization. Such a coordination meeting or conversation must be separate from attendance at a planning committee meeting.

Coordination with an agency can only be counted once. For example, if a letter to an agency results in a follow-up meeting or telephone conversation, the community receives two points.

Examples of such agencies and organizations include, but are not limited to

- Neighboring communities;
- Local and regional agencies involved in hazard mitigation activities;
- Stakeholder-type organizations that are not represented on the planning committee;
- Local drainage, levee, sanitary, and soil and water conservation districts;
- Regional and metropolitan planning agencies;
- State NFIP Coordinator;
- State water resources agency;
- State coastal zone management agency;
- State emergency management agency;
- FEMA Regional Office;
- National Weather Service;
- U.S. Army Corps of Engineers;
- Natural Resources Conservation Service;
- U.S. Bureau of Reclamation;
- U.S. Fish and Wildlife Service;
- National Oceanic and Atmospheric Administration;
- Native American tribes;
- American Red Cross;
- Local homebuilders association; and
- Local environmental groups.

If the community wants the plan to qualify as a multi-hazard mitigation plan, the plan must identify all stakeholders that are involved or given an opportunity to be involved in the planning process. At a minimum, stakeholders must include

- 1) Local and regional agencies involved in hazard mitigation activities,
- 2) Agencies that have the authority to regulate development, and
- 3) Neighboring communities.

An “opportunity to be involved in the planning process” means that the stakeholders are engaged or invited as participants and given the chance to provide input to affect the plan’s content.

—*Local Mitigation Plan Review Guide*, FEMA

Step 4. Assess the hazard

At this step in the planning process, the planner or committee reviews, analyzes, and summarizes data collected about the natural hazard(s) that the community faces. This step focuses on the sources, frequency, extent, and causes of flooding while Step 5 will address the impact of flooding on people, property, infrastructure, the local economy, and natural floodplain functions.

Under Step 3(a), the community gathers data about the flood hazard. This step involves reviewing, analyzing, and summarizing the data from existing flood studies, including the

Flood Insurance Study, drainage problem studies, historical records, and the knowledge and experiences of the planning committee members.

For CRS credit, the community does not need to conduct studies to develop new flood data. However, if this process determines that new maps or data are needed, they should be described for credit under item (d).

The hazard assessment needs to describe the local flood hazard and not be a broad or generic discussion of flooding in general. It needs to discuss how often it floods, the locations of areas that flood, the depth of flooding, and the source or cause of the flooding. Because the most important readers are elected officials and flood-prone residents, the descriptions of the hazards should be in lay terms.

The CRS Community Self Assessment described in Section 240 can help with this step.

Credit Points

The credit for this step is the total of the following points based on what the community includes in its assessment of the hazard. (Maximum credit: 35 points)

- To receive CRS credit for this step, the plan must include a flood hazard assessment credited under item (1).
- If the community is a Category B or C repetitive loss community (see Sections 502–503), this step must cover all of its repetitive loss areas.

(a) 15 points, for including an assessment of the flood hazard in the plan. (REQUIRED) Flood hazard areas that require assessment include

- The Special Flood Hazard Area (SFHA) shown on the Flood Insurance Rate Map (FIRM),
- Repetitive loss areas,
- Areas not mapped on the FIRM that have flooded in the past, and
- Other surface flooding identified in other studies.

(1) 5 points, for a map of the flood hazard areas. Area maps are acceptable for multi-jurisdictional plans.

(2) 5 points, for a description of the known flood hazards, including source of water, depth of flooding, velocities, and warning time.

(3) 5 points, for a discussion of past floods.

(b) 10 points, for including an assessment of less-frequent flood hazards in the plan. For this credit, the community must

(1) Identify the hazard, including

- a. Preparing an inventory of levees that would result in a flood of developed areas if they failed or were overtopped during a flood, and/or

- b. Preparing an inventory of dams that would result in a flood of developed areas if they failed, and/or
 - c. Identifying any of the flood-related special hazards listed in Section 401 of the *CRS Coordinator's Manual* that are found in the community, and/or
 - d. Identifying the coastal A Zone, i.e., the area where wave heights during the 100-year flood are between 1.5 and 3 feet;
- (2) Map the area(s) affected. (For planning purposes, an approximate affected area is sufficient. No new engineering studies are needed. Area maps are acceptable for multi-jurisdictional plans.) If an engineering study is conducted, it may receive credit under Activity 410; and
- (3) Summarize the hazard(s) in lay terms.

Note that, under Activities 620 (Levees) and 630 (Dams), items (b)(1)a and (b)(1)b are prerequisites for reaching Class 4 or better. Additional guidance on inventorying and mapping the areas affected by levee and dam failures can be found in Section 621.b and Section 631.b, respectively. It is recommended that communities incorporate these inventories into their floodplain management plans.

Item (a) is prorated if part of the “flood hazard” is missing, where applicable. For example, if the community is downstream of a dam, has a levee, and has a coastal A Zone, and the assessment includes only the dam failure hazard, the credit will be less than the full 10 points. If the community does not have a levee, it is reflected in the proration.

Two points are provided if the inventory is conducted and concludes that there are no levees, dams, or special flood-related hazards that threaten the community.

- (c) 5 points, if the assessment identifies areas likely to be flooded and flood problems that are likely to get worse in the future as a result of (1) changes in floodplain development and demographics, (2) development in the watershed, and (3) climate change or sea level rise. The credit is prorated if the assessment does not include all three types of changes.
- (d) 5 points, if the plan includes a description of the magnitude or severity, history, and probability of future events for other natural hazards, such as earthquakes, wildfires, or tornados. The plan should include all natural hazards that affect the community. At a minimum, it should include hazards identified by the state's hazard mitigation plan.

***NOTE:** To qualify as a multi-hazard mitigation plan, the plan must address ALL of the community's flood and other natural hazards identified in the hazard assessment. Not only does an all-hazards plan help qualify for mitigation funds, but also it will better prepare the community for hazards other than flooding. It is common for communities to focus only on mitigation of flood problems because they occur more often. However, assessing the other hazards when preparing a flood plan can help address what can be done for all hazards, some of which may occur less frequently, but have a greater impact on the community.*

Step 5. Assess the problem

Flooding can be a natural and beneficial occurrence. A floodplain is only a problem area if human development (the built environment) gets in the way of, or exacerbates, the natural flooding process.

The previous step assessed the hazards facing the community. In this step, the community planners or planning committee members collect and summarize data on what is at risk. This step looks at the impact of those hazards on the community.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

Credit Points

The credit for this step is the total of the following points, based on what is included in the assessment of the vulnerability of the community to the hazards identified in the previous, hazard assessment, step. (Maximum credit: 52 points)

- To receive credit for this step, the assessment must include item (a).
 - Each credited item must cover all relevant flood-related hazards identified in Step 4.
 - Each credited item must include a description and summary of the problem(s). Simply listing data, such as the names of the critical facilities or the number of flood insurance claims, does not suffice for credit—there must be description of the impact of flooding and what kinds of problems arise, not just raw data.
 - For a multi-jurisdictional plan, each item needs to be described for each community. Tables are acceptable to show the data by community, but there still needs to be a narrative description and summary of the problem(s).
- (a) 2 points, if the plan includes an overall summary of the jurisdiction’s vulnerability to each hazard identified in the hazard assessment (Step 4) and the impact on the community. (REQUIRED)
- (b) 25 points, if the plan includes a description of the impact that the hazards identified in the hazard assessment (Step 4) have on the features listed below:
- (1) 5 points, for life safety and the need for warning and evacuating residents and visitors.
 - (2) 5 points, for public health, including health hazards to individuals from flood waters and mold.
 - (3) 5 points, for critical facilities and infrastructure.
 - (4) 5 points, for the community’s economy and major employers.
 - (5) 5 points, for the number and types of affected buildings (e.g., residential, commercial, industrial, with or without basements, etc.). For this credit, the assessment must include an inventory of all buildings owned by the community that are located in flood-prone areas and that identifies which buildings are insured for flood damage.

- (c) 5 points, if the assessment includes a review of historical damage to buildings, including all properties that have received flood insurance claims payments (in addition to the repetitive loss properties) and/or an estimate of the potential damage and dollar losses to vulnerable structures, including damage from mold and other flood-related hazards.

Communities must include repetitive loss areas in their problem assessment. (REQUIRED of Category B and C repetitive loss communities (see Sections 502–503))

In order to receive the full credit under item (c), the community reviews ALL the addresses of properties that have received flood insurance claims, not just the repetitive loss properties. Such a list is sent annually to all Category B and C repetitive loss CRS communities. Communities can request more recent lists through their FEMA Regional Office.

Data on building damage usually can be obtained from post-disaster damage assessment reports, flood insurance claims or disaster assistance data, and flood control studies. Particularly in areas that have experienced little or no serious flooding in recent history, a Hazus-MH flood analysis can yield valuable information about the potential for flood damage and loss (Figure 510-2). For best results, the building/structure inventory data bases in Hazus-MH should be augmented with local input.

The Privacy Act

Flood insurance data on private property, including repetitive loss properties, are subject to the Privacy Act. Information such as the names of people and addresses of properties that have received flood insurance claims and the amounts of such claims MAY NOT be released to the public or used for solicitation or other purposes. Such information should be marked “For internal use only. Protected by the Privacy Act of 1974.”

Generic information, such as total claim payments for an area or data not connected to a particular property MAY be made public.



Hazus-MH is a software program that contains models for estimating potential losses from earthquakes, floods, and hurricane winds. It can be a great help in the Step 5 vulnerability assessment.

Hazus-MH uses geographic information system (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods, and earthquakes on populations.

Copies of Hazus-MH are available at no charge from the FEMA Distribution Center. Users can request that a 60-day trial/evaluation copy of ESRI’s ArcGIS software be sent with Hazus-MH. Users should be familiar with GIS software. Hazus training is available at FEMA’s Emergency Management Institute and elsewhere. Information is at <http://www.fema.gov/hazus/>.

Figure 510-2. About Hazus-MH.

- (d) 5 points, if the assessment describes areas within the floodplain that provide natural functions, such as wetlands, riparian areas, sensitive areas, and habitat for rare or endangered species.

Along with flood protection, comprehensive floodplain management planning should review the unique natural features, natural areas, and other environmental and aesthetic attributes that may be present in the floodplain. Protecting and preserving these natural and beneficial floodplain functions yield flood protection benefits and also help integrate floodplain management efforts with other community goals and objectives. This section should also review existing natural floodplain functions plans, such as those credited under Section 511.c.

- (e) 7 points, if the assessment includes a description of development, redevelopment, and population trends and a discussion of what the future brings for development and redevelopment in the community, the watershed, and natural resource areas.
- (f) 8 points, if the assessment includes a description of the impact of the future flooding conditions described in Step 4(c) on people, property, and natural floodplain functions.

Step 6. Set goals

The goals should set the context for the subsequent review of floodplain management activities and drafting of the action plan (Figure 510-3). They should incorporate or be consistent with other community goals for the affected areas. A multi-hazard mitigation plan should have goals that address all the major hazards that face the community.

Credit Points

The points for this step are provided if the plan includes a statement of the goals of the community's floodplain management or hazard mitigation program. The goals must address all flood-related problems identified in Step 5. (Maximum credit: 2 points)

Step 7. Review possible activities

At this step, the plan reviews different activities that could prevent or reduce the severity of the problems described in Step 5. This is a systematic review of a wide range of activities to ensure that all possible measures are explored, not just the traditional approaches of flood control, acquisition, and regulation of land use. The review, including the pros and cons of each activity, must be included in the plan document. Figure 510-4 lists some of the types of activities that could be reviewed under each of the six credited categories.

NOTE: This review is separate from Step 8, the selection of projects and activities to pursue. It includes activities that may not be selected and explains why some activities may be appropriate for the community and its flooding conditions and why some may not be appropriate.

The range of activities should be evaluated for each area affected. While some of them may be quickly eliminated as inappropriate, most deserve careful consideration, especially to ensure full understanding of their costs and benefits.

St. Tammany Parish, Louisiana, Multi-Hazard Mitigation Plan

1. Protect the lives and health of the Parish's residents from the dangers of natural hazards.
2. Ensure that public services and critical facilities operate during and after a disaster.
3. Ensure that adequate evacuation routes, streets, utilities and public and emergency communications are maintained and available during and after a disaster.
4. Protect homes and businesses from damage.
5. Use new infrastructure and development planning to reduce the impact of natural hazards.
6. Give special attention to repetitively flooded areas.

Gurnee, Illinois, Flood Mitigation Plan

1. Protect existing properties
 - a. Use the most effective approaches to protect buildings from flooding, including acquisition or relocation where warranted.
 - b. Enact and enforce regulatory measures that ensure that new development will not increase flood threats to existing properties.
 - c. Use appropriate measures to mitigate against the danger and damage posed by other natural hazards.
2. Protect health and safety
 - a. Advise everyone of the safety and health precautions to take against flooding and other natural hazards.
 - b. Improve traffic circulation, during floods and at other times.
 - c. Improve water quality and habitat.
 - d. Do something about the mosquitoes.
3. Improve the quality of life in Gurnee.
 - a. Preserve and improve the downtown core of businesses and services.
 - b. Ensure that current owners can maintain and improve their properties.
 - c. Use acquisition programs to expand open space and recreational opportunities.
 - d. Maintain an attractive riverfront and other public open spaces.
4. Ensure that public funds are used in the most efficient manner.
 - a. Prioritize mitigation projects, starting with those sites facing the greatest threat to life, health, and property.
 - b. Utilize public funding to protect public services and critical facilities.
 - c. Utilize public funding for those projects on private property where the benefits exceed the costs.
 - d. Maximize the use of outside sources of funding.
 - e. Maximize owner participation in mitigation efforts to protect their own properties.
 - f. Encourage property-owner self-protection measures.

Figure 510-3. Two examples of communities' statements of their goals.

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
 - Floodplain mapping and data
 - Open space preservation
 - Floodplain regulations
 - Coastal setback/erosion regulations
 - Planning and zoning
 - Stormwater management
 - Drainage system maintenance
 - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
 - Relocation
 - Acquisition
 - Building elevation
 - Retrofitting
 - Sewer backup protection
 - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
 - Wetlands protection
 - Erosion and sediment control
 - Natural area preservation
 - Natural area restoration
 - Water quality improvement
 - Coastal barrier protection
 - Environmental corridors
 - Natural functions protection
4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
 - Hazard threat recognition
 - Hazard warning
 - Hazard response operations
 - Critical facilities protection
 - Health and safety maintenance
 - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
 - Reservoirs
 - Levees/floodwalls
 - Diversions
 - Channel modifications
 - Storm drain improvements
6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
 - Map information
 - Outreach projects
 - Real estate disclosure
 - Library
 - Technical assistance
 - Environmental education

Figure 510-4. Categories of floodplain management activities.

Credit Points

The credit for this step is the total of the following points based on which floodplain management or hazard mitigation activities are reviewed in the plan. (Maximum credit: 35 points)

This step must describe those activities that were considered. There is no credit for simply listing the various types of projects under each credited category. For each activity, there must be a discussion of why the activity is or is not appropriate for the community and its flood problems.

For an activity that is determined to be appropriate,

- The discussion must also include community's capability to fund and implement the activity.
- If an activity is currently being implemented, the plan must note if it is achieving expectations and, if not, whether it should be modified.
- If the plan is an update of a previously credited plan, each activity recommended by the previous plan must be discussed, along with the status of implementation.

The discussion of each activity needs to be detailed enough to be useful to the lay reader.

Section (a) is required for any credit under this step.

(a) 5 points, if the plan reviews preventive activities, such as zoning, stormwater management regulations, building codes, subdivision ordinances, and preservation of open space, and the effectiveness of current regulatory and preventive standards and programs. (REQUIRED) For this credit, the review must include a discussion of the community's

- Comprehensive or land use plan,
- Building code,
- Zoning ordinance,
- Floodplain management regulations,
- Subdivision ordinance, and
- Stormwater management regulations.

The discussion must review

- How these tools can reduce future flood losses,
- The current standards in the community's plans and regulations, and
- Whether the community should adopt or revise such plans and regulations in light of the Step 5 problem assessment and the goals set in Step 6.

- (b) 5 points, if the plan reviews whether the community's floodplain management regulatory standards are sufficient for current and future conditions, as discussed under Steps 4(c) and 5(f).
- (c) 5 points, if the plan reviews property protection activities, such as acquisition, retrofitting, and flood insurance;
- (d) 5 points, if the plan reviews activities to protect the natural and beneficial functions of the floodplain, such as wetlands protection;
- (e) 5 points, if the plan reviews emergency services activities, such as warning and sandbagging;
- (f) 5 points, if the plan reviews structural projects, such as levees, reservoirs, and channel modifications; and
- (g) 5 points, if the plan reviews public information activities, such as outreach projects and environmental education programs.

Step 8. Draft an action plan

After the review of alternatives during Step 7, an action plan is drafted (Step 8) that selects and specifies those activities appropriate to the community's resources, hazards, and vulnerable properties. The community should strive for a balanced program, selecting measures from more than one category of floodplain management activity. In every case, the community should implement preventive activities both to keep its flood problems from getting worse and also to protect new construction from the effects of natural hazards.

There is no requirement that a floodplain management plan identify expensive or massive structural flood control projects. The plan must include activities that the community can be assured will be implemented through its own resources. If outside funding support is needed for some projects, the funding sources should be identified and researched to ensure that the projects are eligible and the community has a chance of receiving the funds. Many of the activities could receive CRS credit once they are implemented.

Note that 50% of the maximum credit for this planning step is a prerequisite for Class 4 or better communities.

Credit Points

The credit points are based on the range of actions that are recommended in the plan, subject to the criteria listed below. (Maximum credit: 60 points)

- For each recommendation, the action plan must identify
 - Who is responsible for implementing the action,
 - When it will be done, and
 - How it will be funded.

“When it will be done” can be specified in terms of a date, a set period of time after another action is complete, after the next flood, etc. “How it will be funded” could state that funding will be dependent on a grant, provided the project is eligible for the grant program.

- The actions must be prioritized. When prioritizing mitigation actions, the planners need to consider the benefits that would result from the mitigation actions and projects versus the cost of those actions. Note that this is not a requirement for a cost-benefit analysis for every action item. However, an economic evaluation is essential for selecting one or more actions from among many competing ones.
 - There must be an action item for each goal in Step 6. An example of this is in Figure 510-5.
 - Credit is provided for a recommendation on floodplain regulations, provided it recommends adopting or continuing a regulatory standard that exceeds the minimum requirements of the National Flood Insurance Program (NFIP). Simply continuing to meet the minimum criteria of the NFIP is not credited as an action item to improve the community’s floodplain management program.
 - If the plan calls for acquiring properties, there must be a discussion of how the project(s) will be managed and how the land will be used after it is acquired.
 - When a multi-jurisdictional plan is prepared, it must have action items from at least two of the six categories that directly benefit each community seeking CRS credit.
 - To qualify as a multi-hazard mitigation plan, the plan must include a “process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate” (44 *CFR* §201.6(c)(4)(ii)). The action items that relate to preventive activities should clarify how this is done. For example, an action item could recommend that the next time the zoning ordinance is revised, flood and landslide hazard areas be considered when determining allowable uses.
- (a) 45 points, depending on how many categories are covered by the action items:
- (1) 10 points, if the action plan includes flood-related recommendations for activities from two of the six categories credited in Step 7; OR
 - (2) 20 points, if the action plan includes flood-related recommendations for activities from three of the six categories credited in Step 7; OR
 - (3) 30 points, if the action plan includes flood-related recommendations for activities from four of the six categories credited in Step 7; OR
 - (4) 45 points, if the action plan includes flood-related recommendations for activities from five of the six categories credited in Step 7.

Table 9-1. Action Items, Goals, and Recommendations							
Action Item	Goal 1. Protect critical facilities and utilities	Goal 2. Protect lives and health	Goal 3. Protect homes, businesses, and schools	Goal 4. Minimize the costs to the City and property owners	Goal 5. Ensure that new construction supports these goals	Chapter – Recommendation	Deadline
9.2. Administrative Action Items							
1. <i>Plan</i> adoption	X	X	X	X	X		5/31/07
2. Monitoring and reporting	X	X	X	X	X		9/30 each year
3. Community Rating System	X	X	X	X	X	4-3, 6-5, 7-3, 8-1 - 8-8	CRS visit
9.3. Program Action Items							
4. Levee improvements	X	X	X	X		4-1	Ongoing
5. Drainage improvements	X	X	X	X		4-2	8/31/08
6. Drainage system maintenance	X	X	X			4-3	CRS visit
7. Property protection funding	X	X	X	X		5-2, 5-3	8/31/07
8. Regulatory review	X		X		X	6-5	CRS visit
9. NFIP administration	X	X	X		X	6-2	After CAC
10. CFMs	X	X	X		X	6-2, 6-3	8/31/07
11. BCEGS	X	X	X		X	6-4	5/31/07
12. Flood response plan	X	X	X			7-1 – 7-4	Ongoing
9.4. Public Information Action Items							
13. Annual mailing		X	X		X	8-1, 8-2, 8-7, 8-8	Each Spring
14. Technical references		X	X		X	8-4, 8-5	CRS visit
15. Public information projects		X	X		X	4-4, 5-1, 6-1, 6-6, 7-4, 8-1 – 8-8	Ongoing
16. Public information messages		X	X		X	4-4, 5-1, 6-1, 6-6, 7-4, 8-1 – 8-8	Ongoing
<p>This table relates the 16 action items to the 5 goals of this Plan. The goals are stated in full on pages 3-6 and 9-1. The table also shows the relation between the action items and the recommendations at the end of chapters 4 – 8. For example action item 8, Regulatory Review, implements recommendation 6-5 at the end of chapter 6. The reviews need to be completed in time for the CRS verification visit, which will be in the second half of 2007.</p>							

Figure 510-5. An excerpt from the City of Gretna, Louisiana’s Flood Hazard Mitigation Plan.

- (b) 10 additional points are provided if the action plan establishes or revises post-disaster redevelopment and mitigation policies and procedures. These policies and procedures should account for the expected damage from a base flood or other disaster. For example, the action plan should identify the areas likely to be worst hit and the policies should determine whether they will be rebuilt if substantially damaged. Post-disaster mitigation procedures should assign responsibilities for public information, code enforcement, planning, and other efforts that encourage, mandate, and/or fund loss reduction activities.

Note that Activity 330 (Outreach Projects) provides credit for public information materials developed for use during and after a flood (Flood Response Preparations (FRP)). Preparation of those materials should be done when the other post-disaster policies and procedures are prepared.

- (c) 5 additional points are provided if the plan includes action items (other than public information activities) to mitigate the effects of the other natural hazards identified in the hazard assessment (Step 4, item (b)).

Step 9. Adopt the plan

The points for this step are provided if the plan and later amendments are officially adopted by the community's governing body. The plan must be an official plan of the community, not an internal staff proposal. "Adopted" means that there is a resolution or other formal document that is voted on by the community's governing body. A note in the minutes or passage via a consent agenda is not credited.

When a multi-jurisdictional plan is prepared, it must be adopted by the governing body of each community seeking CRS or multi-hazard mitigation plan credit.

Step 10. Implement, evaluate, and revise

To be useful, planning must be ongoing and plans must be dynamic. The plan should not sit on a shelf gathering dust once it is completed. Therefore, the community must have an evaluation and update process.

For CRS credit, plans must be implemented. No plan is perfect. As implementation proceeds, flaws will be discovered and changes will be needed. Not only can hazard conditions change but also goals and objectives may change. If a community is hit by a tornado, for example, the short-term action items may be changed to focus attention on the newly damaged areas in the SFHA.

Changes should be made in the action plan when opportunities arise to add new activities or complete some items ahead of schedule. The plan should also be revised if it is found that some activities cannot be completed on the original timetable. At a minimum, these types of changes must be made at the required 5-year update.

The key to this step is the annual evaluation report on progress in implementing the plan. Not only are annual evaluations required with the community's annual recertification, but also the process of conducting an annual evaluation gives the community a framework for

monitoring the plan's effectiveness and the community's progress in implementing it. Failure to submit the evaluation report with the community's annual recertification will result in loss of the planning credit (i.e., FMP = 0). This can cause a Category C repetitive loss community to revert to a Class 10.

Credit Points

The credit for this step is the total of the following points, based on how the community monitors and evaluates its plan. (Maximum credit: 26 points)

- The plan document must describe how, when, and by whom the plan will be monitored, evaluated, and revised. It is recommended that these items be included in the adoption resolution as well.
 - An annual evaluation report on progress towards plan implementation must be prepared at least once each year and submitted with the community's annual CRS recertification. The report must be submitted to the governing body, released to the media, and made available to the public.
 - If a community receives credit as a result of participation in a multi-jurisdictional plan that includes action items for each community, the annual evaluation report must cover those action items. This can be done either by a multi-jurisdictional planning committee or through separate submittals by each community. However, a community will not receive credit if it did not participate in the meeting at which the annual report was prepared. Therefore, the submittal needs to show who participated in the preparation of the report.
 - The community must update the plan at least every five years. The update is due by October 1, five years after the plan was adopted (see next section).
 - Step 10(b) provides credit if the planning committee does the evaluation and revision. If the committee does not continue to meet and report or if the committee membership no longer meets the credit criteria in Step 2(a), the community will not keep the committee credits under Steps 1(b) or 2(a).
- (a) 2 points, if the community has procedures for monitoring implementation, reviewing progress, and recommending revisions to the plan in an annual evaluation report. The report must be submitted to the governing body, released to the media, and made available to the public. (REQUIRED)
- (b) 24 points, if the annual evaluation report is prepared by the same planning committee that prepared the plan that is credited in Step 2(a) or by a successor committee with a similar membership that was created to replace the planning committee and charged with monitoring and evaluating implementation of the plan. The points are based on how frequently the committee meets, since more frequent meetings yield more progress toward implementing the plan. The committee must continue to meet the representation, quorum, and other criteria that determined the credit points under Step 2(a).
- (1) 6 points, if the committee meets only once a year.
 - (2) 12 points, if the committee meets twice a year.
 - (3) 24 points, if the committee meets at least quarterly.

Five-year Update

The community must submit a copy of its plan update at least every five years. The plan update will be reviewed for CRS credit according to the *Coordinator's Manual* currently in effect, not the version used when the community originally requested this credit. The update must include the following steps:

- (a) Steps 1 and 2: If the original planning process included a committee, then in order to keep the credit provided under Step 1(b) or Step 2(a), the update must be conducted by a committee that meets the criteria identified in those steps.
- (b) Step 2: If the original planning process received credit for a public meeting credited under Step 2, item (c), then to keep this credit the community must also conduct a public meeting that reviews and receives comments on the draft update.
- (c) Step 3, item (a): The update must include a review of new studies, reports, and technical information and of the community's needs, goals, and plans for the area that have been published since the plan was prepared.
- (d) Steps 4 and 5: The hazard and problem assessments must be reviewed and brought up to date. The assessments must account for
 - New floodplain or hazard mapping,
 - Annexation of flood-prone areas,
 - Additional repetitive loss properties,
 - Completed mitigation projects,
 - Increased development in the floodplain or watershed,
 - New flood control projects,
 - Lack of maintenance of flood control projects,
 - Major floods or other disasters that occurred since the plan was adopted, and
 - Any other change in flooding conditions and/or development exposed to flooding or the other hazards covered in the plan.
- (e) Step 6: The original plan's goals must be reviewed to determine if they are still appropriate, given the revisions to Steps 4 and 5.
- (f) Step 8: The action plan must be revised to account for projects that have been completed, dropped, or changed and for changes in the hazard and problem assessments, as appropriate.
- (g) Step 9: The update must be adopted by the community's governing body.

An annual evaluation report that includes these steps may qualify as the five-year update (but may not qualify as an update for a multi-hazard mitigation plan).

Impact Adjustment

rFMP is a ratio that reflects how much of the community's flood hazard areas are covered by the floodplain management plan. Note that to qualify for a hazard mitigation plan, all of the community's flood hazards must be covered.

rFMP = EITHER

1.0, if the plan covers all of the community's known flood hazard areas. "Known flood hazard areas" means the SFHA shown on the FIRM, repetitive loss areas, areas not mapped on the FIRM that have been flooded in the past, and surface flooding identified in existing studies (see Step 4)

OR

0.25, if the planning covers either all of the community's repetitive loss areas or at least 25% of the community's known flood hazard areas.

Documentation Provided by the Community

- (1) With the submittal of the plan or the five-year update to the plan,
 - (a) A copy of the plan or updated plan to be credited. This can be a hard copy, digital copy, or link to a website with the full document. Either the plan is marked, or a separate document is provided, to show where each credited step and sub-step appears. There is a checklist that can be used to do this, available at www.CRSresources.org/500.
 - (b) [For Step 1(b) credit for a committee of staff from different departments] The plan or a separate document must show which department representatives implement, or have expertise in, which of the six categories of mitigation measures.
 - (c) [For Step 1(c) credit] A copy of the resolution or other official action taken by the governing body to create or recognize the planning process as specified in Step 1. For Step 2(a) credit for a planning committee, the resolution or action must identify the committee's membership.
 - (d) [For Step 2(a) credit for a planning committee] The names of the committee members, their titles, and their represented organizations must be listed in the plan. The community may submit separate materials, such as meeting minutes and sign-in sheets, to document meeting attendance.
 - (e) For Step 2(b), (c), or (d) credit for public meetings] Copies of the publicity for the public meetings. The notices of the meetings should be in the form of letters to floodplain residents, a notice sent to all residents, or a newspaper article or advertisement. An inconspicuous legal notice appearing in the classified section of the newspaper is not sufficient for CRS credit. If very few residents are affected, as

may be the case for a plan that addresses only a repetitive loss area, a written record that the residents were called would be sufficient documentation.

- (f) [For Step 3(a) credit for reviewing existing studies, reports, and technical information] The plan must note where the information from the studies and reports was used, e.g., with quotations or footnotes. The plan also needs to include a list of all the documents reviewed. This is usually done in a reference section or at the end of each chapter.
- (g) [For Step 3(b) credit for coordination with other agencies and organizations] A record of the contacts and meetings. Acceptable records include letters that cover the items needed for coordination, copies of any responses that were received, follow-up memos from the meetings, notes from telephone conversations, and e-mails. These items are usually not included as a part of the plan document.
- (h) A copy of the resolution or other formal adoption action by the governing body as specified in Step 9. The resolution should identify the implementation responsibilities, describe the evaluation and revision procedures, and call for the five-year update (or adopt by reference such language that may be in the plan document).

(2) With each annual recertification,

- (a) A copy of the annual evaluation report as specified in Step 10. The report must review each action item, describe what was implemented (or not implemented), and recommend changes to the action plan as appropriate. If not in the evaluation report document, the recertification submittal must also include the minutes of the committee meeting(s) (if getting credit for Step 10(b)) and a description of how the report was submitted to the governing body, released to the media, and made available to the public.

NOTE: Failure to submit the floodplain management plan's evaluation report with the annual recertification or the five-year update at the following cycle verification visit will result in loss of the planning credit (i.e., FMP = 0). Loss of credit for this activity may cause a repetitive loss Category C community to revert to a Class 10.

512.b. Repetitive loss area analysis (RLAA)

The maximum credit for this element is 140 points.

A repetitive loss area analysis is a detailed mitigation plan for a repetitive loss area. It provides more specific guidance on how to reduce damage from repetitive flooding than a community-wide floodplain management or hazard mitigation plan. Mapping repetitive loss areas is discussed in Section 503.

As with a floodplain management plan, CRS credit is dependent upon the community's following an appropriate process. The five steps for an area analysis are less involved than the 10-step floodplain management planning process, but the analysis must evaluate each building in the repetitive loss area(s).

A community may receive credit for both a floodplain management plan and repetitive loss area analyses. Area analyses may be conducted during floodplain management planning or a floodplain management plan may identify areas needing analyses, which are conducted after the plan is adopted. For CRS credit, a separate analysis must be prepared for each repetitive loss area and made available to residents of those areas.

Additional guidance and suggestions for conducting an area analysis can be found in Chapter 7 of *Reducing Damage from Localized Flooding*, FEMA-511.

Credit Criteria

- (1) Communities with one or more repetitive loss properties on FEMA’s list must have at least one repetitive loss area delineated in accordance with the criteria in Section 503. The area(s) must include at least one of the properties on FEMA’s repetitive loss list.

An exception to this criterion is made for communities that have no historic repetitive flood claims, but are nevertheless working to reduce repetitive flooding. These communities may prepare area analyses for areas that have been repetitively flooded. The analyses must describe and map the repetitive flooding problem (including all past flood insurance claims, if any) and meet all the following credit criteria. If there are multiple areas, they must not be contiguous. Communities using this approach may receive 20 credit points per area.

- (2) An area analyses must have been prepared and adopted for each repetitive loss area in the community. The analyses must meet the following criteria:
 - (a) The repetitive loss areas must be mapped as described in Section 503.b.
 - (b) If the community does not conduct an analysis of all the areas, it will be reflected through the impact adjustment. A Category C community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite (see Section 502).
 - (c) A five-step process must be followed. Although all five steps must be completed, steps 2–4 do not have to be done in the order listed. For example, the planners may want to contact agencies and organizations to see if they have useful data (Step 2) after the site visit is conducted (Step 3).

Step 1. Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions. The notice (or any public document) cannot identify which properties are on FEMA’s repetitive loss list (see the box on flood insurance data and the Privacy Act). There are no restrictions on publicizing what properties are in repetitive loss AREAS that have more than one property and there are not restrictions on publishing aggregate data, such as how many properties received claims or the average value of those claims. Community planning staff may share insurance claims information with the owner of the property, but may not make it available to anyone else.

- The notice can be sent to owners OR residents at the community’s discretion, as long as a representative of each property is notified.

The Privacy Act

Flood insurance data on private property, including repetitive loss properties, are subject to the Privacy Act. Information such as the names of people and addresses of properties that have received flood insurance claims and the amounts of such claims MAY NOT be released to the public or used for solicitation or other purposes. Such information should be marked “For internal use only. Protected by the Privacy Act of 1974.”

Generic information, such as total claim payments for an area or data not connected to a particular property MAY be made public.

- The notice cannot be done via a newspaper or newsletter notice or article.
- The notice must advise the recipients when and how copies of the draft report can be obtained and ask for their comments on the draft.

Step 2. Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies or organizations must be identified in the analysis report.

Step 3. Visit each building in the repetitive loss area and collect basic data.

- The site visit must collect data sufficient to do a preliminary determination of the cause of the repetitive flooding and of the mitigation measures that would be appropriate. This usually includes a review of drainage patterns around the building, the condition of the structure, and the condition and type of foundation.
- The person conducting the visit should not have to enter the property—adequate information should be collected from observations from the street.
- Floor elevations or historical flood levels are not required, but can be very helpful where available.
- The date for each building’s insurance claim can help identify the cause of flooding (e.g., rainfall or overbank flooding) and the amount of the claim can help determine the amount of damage. Note that, every year, each repetitive loss community is provided with a list of its historic insurance claims. This includes single-claim properties. Non-repetitive-loss communities that elect to do an RLAA may request these data from their ISO/CRS Specialist.
- More information on appropriate data can be found in *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA-551.
- This step may be done using the “limited data view” of the National Flood Mitigation Data Collection Tool (Figure 510-6).

The National Flood Mitigation Data Collection Tool has been developed by FEMA to gather information related to risk, building construction, and costs in order to help make decisions about what mitigation measures are appropriate for a flood-prone property. The tool is in Microsoft Access format and is free to any public agency. See www.fema.gov/plan/prevent/floodplain/data_tool.shtm.

The tool may be populated with insurance claim data for the properties. The local planners need to remember that such information is subject to the Privacy Act, which prohibits public release of the names of policy holders or recipients of financial assistance and the amount of the claim payment or assistance. However, maps showing areas where claims have been paid can be made public. The data can be used for internal planning and can be helpful in identifying problem areas.

The tool has two levels of data collection. Limited data usually can be collected through a windshield-type survey, while completing the entire detailed data section may require elevation surveying and structural inspections inside the buildings. The detailed data are collected when the limited effort concludes that mitigation is possible and the additional data are needed to determine the most appropriate mitigation measure and its benefits and costs.

Figure 510-6. The National Flood Mitigation Data Collection Tool.

Step 4. Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible. The review must look at all of the property protection measures listed in Figures 360-1 and 510-4 that are appropriate for the types of buildings affected. A review that looks only at drainage or structural flood control project alternatives is not sufficient.

Step 5. Document the findings. A separate analysis must be conducted for each area. In general, separate reports are preferred for each area, but in cases in which several areas have similar building and flooding characteristics and similar mitigation measures are appropriate, the analyses can be assembled into a single report. Each report must include

- A summary of the process that was followed, including how the property owners were involved;
- The problem statement with a map of the area affected. The statement and map may show individual properties or parcels, but cannot show which ones are on FEMA's repetitive loss list;
- A list or table showing basic information for each building, such as address, foundation type, condition, and appropriate mitigation measures. This list cannot include insurance data, such as how many claims have been paid for that property. If the property owners responded to a survey, the survey responses may be included (unless the community promised confidentiality);
- The alternative approaches that were reviewed; and

- Action items that include
 - Who is responsible for implementing the action,
 - When it will be done, and
 - How it will be funded.

“When it will be done” can be expressed in terms of a date, a set period of time after another action is complete, after the next flood, etc. “How it will be funded” could state that funding will be dependent upon receiving a grant, provided that one or more suitable grant programs are specified to which application(s) for funding will be made.

- (3) The repetitive loss area analysis report(s) must be submitted to the community’s governing body and made available to the media and the public. If private or sensitive information is included in the report, then a summary report may be prepared for the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community’s governing body or by an office that has been delegated approval authority by the community’s governing body.
- (4) The community must prepare an annual evaluation report for its area analyses.
 - The report must review each action item, describe what was implemented (or not implemented), and recommend changes to the action items as appropriate.
 - One annual report can cover some or all of the area analyses that were prepared.
 - The report must be made available to the media and the public (including the property owners and residents of the repetitive loss areas).
 - The report is submitted with the community’s annual recertification.
- (5) The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.
 - The update must review the flooding and building conditions as well as any changes to FEMA’s repetitive loss list, to determine whether the number of buildings on the list or other circumstances have changed, and revise the mapping and action items accordingly.
 - The update can be a new report or an addendum to the existing report.
 - An annual evaluation report that reviews and updates the 5-step process may qualify as the area analysis update.
 - The update can qualify as the annual evaluation report for the year it was prepared.
 - The update must be made available to the media and the public (including the property owners and residents of the repetitive loss areas).

If, during the area analysis or annual reviews, the community finds that the flood risk to one or more repetitive loss properties has been mitigated, FEMA must be notified by submitting an AW-501, as described in Section 501.

- If the repetitive flooding problem has been mitigated, the appropriate documentation must be submitted in order to remove the properties from FEMA’s repetitive loss list (see Section 501).
- Any changes to an adopted area analysis must be approved following the same process as approval of the original analysis.

Credit Points

$$\text{RLAA} = 140$$

The maximum credit for this element is 140 points. A community can obtain the maximum only if it prepares and adopts repetitive loss area analyses for all its repetitive loss areas. This is factored in through the impact adjustment.

Impact Adjustment

rRLAA is the ratio of the number of buildings covered by credited area analyses to the total number of buildings in the community’s repetitive loss areas. See Sections 301–303 on calculating an impact adjustment.

$$\text{rRLAA} = \frac{\text{bAA}}{\text{bRLA}}, \text{ where}$$

bAA = the number of buildings addressed in credited area analyses, and

bRLA = the number of buildings in the community’s repetitive loss areas

Documentation Provided by the Community

(1) At each verification visit,

- (a) A copy of each repetitive loss area analysis report or update of an earlier report that the community wants credited (see Step 5).
- (b) Documentation showing how the owners or residents of the areas were notified (see Step 1).
- (c) Documentation showing how the analysis was made available to the media and the public.
- (d) A copy of the resolution or other formal action by the governing body that adopts the area analysis or accepts changes in subsequent updates.

(2) With the annual recertification,

- (a) A copy of the annual evaluation report (Section 512.b, credit criterion (4)). If not in the evaluation report, the recertification submittal must also document how the evaluation report and update were made available to the media and the public.

NOTE: Failure to submit the area analysis' evaluation report with the annual recertification or the update at the next cycle verification visit will result in loss of the credit (i.e., RLAA = 0). Loss of credit for this activity may cause a repetitive loss Category C community to revert to a Class 10.

512.c. Natural floodplain functions plan (NFP)

The maximum credit for this element is 100 points.

NFP credit is provided for adopting plans that protect one or more natural functions within the community's floodplain. Examples include

- A habitat conservation plan that explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.
- A habitat protection or restoration plan that identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.
- A "green infrastructure plan" that identifies open space corridors or connected networks of wetlands, woodlands, wildlife habitats, wilderness, and other areas that support native species, maintain natural ecological processes, and/or sustain air and water resources (for credit, the corridors or networks must include some floodplains).
- A plan or section of a comprehensive or other community plan that includes an inventory of the ecological attributes of the watershed and/or the floodplain and recommends appropriate actions for protecting them, provided that the recommendations are implemented through a mechanism such as a development regulation, development order, grant program, or capital improvement plan.

NOTE: Element NFOS2, (section 2 of the natural floodplain functions open space credit under Activity 420 (Open Space Preservation)), provides bonus credit for open space parcels that are designated in a plan to protect natural functions. A plan that receives NFP credit qualifies parcels for this extra open space credit.

Credit Criteria

(1) For all plans:

- (a) The plan may cover more than one community, but it must have an impact on natural floodplain functions within the community seeking credit.
- (b) The plan must be adopted. If the plan is not a community plan adopted by the community's governing body, it must be adopted by the appropriate regional agency.
- (c) The plan must be updated at least once every 10 years. The update must include a review of any changes to conditions as well as progress made since the original plan was prepared. Any changes to the adopted plan must be approved by the original adopting agency.

- (d) The plan must include action items for protecting one or more identified species of interest and natural floodplain functions. The action items must describe who is responsible for implementing the action, how it will be funded, and when it will be done. General policy statements with no means of implementation are not considered action items.
 - (e) There is no credit for a plan that addresses water quality issues prepared pursuant to a requirement for an NPDES (National Pollution Discharge Elimination System) permit. Plans to improve drainage, stormwater storage, or channel bank erosion may be credited under Activity 450 (Stormwater Management) or Activity 540 (Drainage System Maintenance).
- (2) For NFP1: A plan for NFP1 credit must include a comprehensive inventory of the natural floodplain habitat within the community. It must identify areas that warrant protection or preservation in order to maintain fully functioning habitat for the species of interest. Where threatened or endangered species are present, each species must be addressed and a restoration plan must be included.
- (3) For NFP2: This sub-element credits other plans that meet the credit criteria listed in (1). These could be single-issue or single-species plans or plans that cover only one area of the community's floodplain.

Credit Points

NFP = the total of the following

NFP1 = 80 points, for a plan, or combination of plans, that meets credit criteria (1) and (2) and covers the entire SFHA within a community

NFP2 = 15 points, for each plan that meets credit criterion (1)

Impact Adjustment

There is no impact adjustment for this element. The NFP1 plan must cover the entire community or all of the community's floodplains. Each NFP2 plan receives the appropriate credit regardless of the extent of the area covered.

Documentation Provided by the Community

- (1) At each verification visit,
- (a) A copy of each natural floodplain functions plan or update to a plan that the community wants credited.
 - (b) A copy of the resolution or other formal adoption action.

513 Credit Calculation

$c510 = (FMP \times rFMP) + (RLAA \times rRLAA) + NFP$, where

FMP = the total of the credit points for the 10 steps in Section 512.a

514 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/500.
- b. See Appendix C to order a free copy of *CRS Credit for Floodplain Management Planning*. It is also on the CRS website, at www.CRSresources.org/500.
- c. Hazus-MH is a risk assessment software program that is described in Figure 510-2. Copies are available free from FEMA. Users need to be familiar with operating GIS software. Training is also available. More information is available at www.fema.gov/hazus/.
- d. Contact state or regional planning, water resources, natural resources, environmental protection, state hazard mitigation, or NFIP coordinating agencies for information on state and federal agencies that can help prepare a floodplain management plan.
- e. The following publications discuss the floodplain management planning process and the variety of measures that should be examined. They can be found on the websites noted.

FEMA has a series of “how-to guides” on planning, to help communities meet the multi-hazard mitigation planning criteria. They can be found at <http://www.fema.gov/hazard-mitigation-planning-resources#1>.

Getting Started: Building Support for Mitigation Planning (FEMA-386-1) covers planning Phase I and CRS planning Steps 1–3.

Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA-386-2) covers planning Phase II and CRS planning Steps 4–5.

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies (FEMA-386-3) covers planning Phase III and CRS planning Steps 6–8.

Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA-386-4) covers planning Phase IV and CRS planning Steps 9–10.

Integrating Manmade Hazards into Mitigation Planning, FEMA-386-7.

Reducing Damage from Localized Flooding: A Guide for Communities, FEMA-511 (2005). Also available at www.fema.gov/library/viewRecord.do?id=1448.

Planning for Post Disaster Recovery and Reconstruction, American Planning Association (APA) Planning Advisory Service, 346 pages, APA Report # 483/484, FEMA-421 (1998). www.fema.gov/library/viewRecord.do?id=1558.

Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability, 43 pages, FEMA-364, 2000. Also available for downloading at www.fema.gov/plan/mitplanning/linkmitliv.

Reducing Losses in High Risk Flood Hazard Areas—A Guidebook for Local Officials, FEMA-116, 1987. Also available for downloading at www.fema.gov/library/viewRecord.do?id=1508.

“Mitigation Benefit Cost (BCA) Toolkit Compact Disc.” This CD includes all the FEMA BCA software, technical manuals, BCA training course documentation, and other supporting material and BCA guidance. Copies can be obtained by calling FEMA’s toll-free BC Hotline at 1-866-222-3580.

- f. *Hazard Mitigation: Integrating Best Practices into Planning*, James C. Schwab (ed.) (2010) is published by the American Planning Association as Planning Advisory Service No. 560. Available for \$60 from www.planning.org/apastore/.
- g. The Corps of Engineers can also provide technical information and advice to communities interested in preparing a comprehensive floodplain management plan. Requests for assistance should be submitted to the Flood Plain Management Services Coordinator at the appropriate District Office of the Corps. Corps offices can be found at www.usace.army.mil/ContactUs.html.
- h. The following publications can help with a repetitive loss area analysis.

Selecting Appropriate Mitigation Measures for Floodprone Structures, FEMA-551.

Reducing Damage from Localized Flooding: A Guide for Communities, FEMA-511 (2005).

Flood Proofing: How to Evaluate Your Options, U.S. Army Corps of Engineers (1994). Also available for downloading at www.nwo.usace.army.mil/nfpc/.

515 Related Activities under the Community Rating System

- A floodplain management plan should be a blueprint for ALL of a community’s public information and floodplain management activities. Planning Step 7 should review all ongoing and possible activities and Step 8 should identify which should continue, which should change, and what new ones should be initiated.
- The CRS Community Self Assessment in Section 240 can help with the hazard and problem analyses in FMP Steps 4 and 5.
- Activities 330 (Outreach Projects) and 370 (Flood Insurance Promotion) provide credit for having a committee that meets criteria very similar to those of the committee in FMP Step 2. The same committee can fulfill all activities’ credit criteria.
- The credit for natural floodplain functions open space (NFOS) under Activity 420 (Open Space Preservation) can be increased if the open space parcels are identified in a natural floodplain functions plan (NFP).

- A repetitive loss area analysis (RLAA) can identify projects and priorities for mitigation activities that can receive bonus credit under Activities 520 (Acquisition and Relocation) and 530 (Flood Protection).
- A multi-hazard mitigation plan that meets FEMA planning criteria is a prerequisite for FEMA funding for projects that can be credited under Activities 520 (Acquisition and Relocation) and 530 (Flood Protection).

520 ACQUISITION AND RELOCATION—Summary

Maximum credit: 2,250 points

522 Elements

A community can obtain credit under one or a combination of elements. The elements reflect the different scoring that is applied to different types of buildings. A given building can only be credited under one element.

- a. **Buildings acquired or relocated (bAR)** from the regulatory floodplain.
- b. **Buildings on the repetitive loss list (bRL)** that have been acquired or relocated.
- c. **Severe Repetitive Loss properties (bSRL)** that have been acquired or relocated.
- d. **Critical facilities (bCF)** that have been acquired or relocated.
- e. **Buildings located in the V Zone or coastal A Zone (bVZ)** that have been acquired or relocated.

Credit Criteria

Credit criteria for this activity are described in Section 521.b. Each element has additional criteria specific to that element.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

The documentation needed for this activity is described in Section 524.

520 ACQUISITION AND RELOCATION

The OBJECTIVE of this activity is to encourage communities to acquire, relocate, or otherwise clear existing buildings out of the flood hazard area.

521 Background

Acquisition and relocation projects remove people and property from harm's way and reduce the community's costs for disaster response, recovery, and repair. The Federal Emergency Management Agency (FEMA) recognizes that the acquisition of buildings in the floodplain is especially effective at reducing flood losses because it is a permanent form of mitigation. Other government agencies also have found acquisition projects to be more cost effective than major flood control projects.

Acquisition and relocation (or demolition) of buildings also creates additional open space in the floodplain and allows those lands to return to their natural functions. Acquisition is the most effective mitigation alternative for addressing repetitive loss properties (see Sections 501–503).

521.a. Activity Description

The maximum credit for Activity 520 is 2,250 points. A community can obtain credit with one or a combination of the five elements, provided that the total credit does not exceed 1,900 points. Up to 350 additional points are provided in Section 523.b if more than 30% of the buildings in the Special Flood Hazard Area (SFHA) have been acquired or relocated. The credit points for each element are not listed because any element alone could be worth up to 1,900 points, depending on the circumstances in the community.

This activity credits the acquisition of a property and either the demolition of the building, or the relocation of the building outside the regulatory floodplain. Credit is provided as long as an insurable building is removed from the regulatory floodplain and the community can document that the property (or that portion of the property that lies within the regulatory floodplain) will remain vacant. The credit points are based on the number of buildings cleared in proportion to the total number of buildings in the community's SFHA. Different types of buildings are credited differently under the five elements:

- Buildings acquired or relocated away from the regulatory floodplain (bAR),
- Buildings on the repetitive loss list that have been acquired or relocated (bRL),
- Severe Repetitive Loss properties that have been acquired or relocated (bSRL),
- Critical facilities that have been acquired or relocated (bCF), and
- Buildings located in the V Zone or coastal A Zone that have been acquired or relocated (bVZ).

No Community Rating System (CRS) credit is provided for acquisition or relocation projects undertaken before the community joined the Regular Phase of the National Flood Insurance Program (NFIP). No credit is provided for removing a building if another

building has since been built on the same site, even if the new building was built to flood protection standards (although such a project may qualify for credit under Activity 530 (Flood Protection)).

521.b. Activity Credit Criteria

To be counted toward any of the elements in this activity, an acquired or relocated building must meet all of the following requirements.

- (1) It must have been an insurable building. A description of the kinds of buildings that can be counted toward this activity appears in Section 301 and 302. Note that when buildings are counted toward this and other CRS activities, only the primary structure on a lot is counted. There is no credit for removing accessory structures, such as detached garages and storage sheds.
- (2) It must have been acquired or relocated after the date of the community's initial FIRM.
- (3) The building site will remain preserved as open space. This is documented in the same way as crediting a property for open space preservation (OSP) in Activity 420. There is, in effect, the potential for duplicate credit for purchasing a property and maintaining it as public open space under Activities 520 and 420. There may also be additional credit if the property is preserved as open space under a deed restriction (DR) or restored to its natural condition (NFOS).

Environmental Protection and Historic Preservation

Because it is a FEMA program, the CRS must ensure that activities for which it provides credit are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA's policy. Figure 500-5 lists the federal programs that should be considered during project development.

These extra credits are encouraged because of the benefits of maintaining the floodplain as open space. However, this criterion does not mandate that the community apply for Activity 420 credit, only that it provide the same documentation that is needed for OSP under Activity 420. The documentation is also needed for areas outside the regulatory floodplain where there is no Activity 420 credit, such as for repetitive loss properties (bRL).
- (4) If the building was relocated, there is no credit if it was moved to a site in the regulatory floodplain or a mapped repetitive loss area.
- (5) A building is counted toward only one of the five elements.
- (6) If a building was acquired or cleared with funding support from FEMA's Flood Mitigation Assistance (FMA) program, then the credit is 25% of the points listed for the element. This is explained in Section 506.

- (7) Acquisition or relocation projects must have been compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). The Certification of Compliance with Environmental and Historic Preservation Requirements for Acquisition and Relocation Projects, CC-520EHP, must be completed for projects that are permitted or initiated after the effective date of the 2013 *CRS Coordinator's Manual*. The certification form can be found in Appendix F, on www.CRSresources.org, or requested from the ISO/CRS Specialist. Credit is not provided if the project was not in compliance with applicable federal laws and executive orders.
- (8) There is no credit for a project initiated to meet the minimum criteria of the NFIP. Credit can be provided for buildings that were substantially damaged. Removing them from the floodplain is above and beyond the NFIP requirement that such buildings be brought up to post-FIRM conditions.

522 Elements

522.a. Buildings acquired or relocated (bAR)

The credit for this element is based on the number of buildings in the regulatory floodplain that have been acquired or relocated.

***NOTE:** The “regulatory floodplain” is defined in Section 120, Glossary. It includes the SFHA and areas outside the SFHA that are subject to the community’s floodplain management regulations. bAR credit is for clearing buildings out of the regulatory floodplain. The extra bonus points in Section 523.a are based on the number of buildings cleared out of the SFHA.*

bAR = the number of buildings acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the FIRM

Credit Criteria

- (1) For bAR credit, buildings must have been acquired or relocated since the effective date of the FIRM.
- (2) The building must have been located in the regulatory floodplain as shown on the impact adjustment map prepared in accordance with Section 403.

If the community did not prepare an impact adjustment map, credit is provided for buildings that were in the SFHA as shown on the community’s current FIRM or a published preliminary FIRM, whichever shows the larger floodplain. If areas outside the SFHA are included in the community’s regulatory program and credit is requested for buildings acquired or relocated in these areas, the community must demonstrate that these buildings were in areas currently regulated to at least the minimum standards of the NFIP.

- (3) A building that lies outside the regulatory floodplain because of remapping, completion of a flood control structure, or other activity is not eligible for this credit. Such a building has already benefited twice: first, it is not subject to the mandatory NFIP insurance purchase requirement; and second, if the owner chooses to purchase NFIP insurance, the premium will be based on the lower X-Zone rate.

522.b. Buildings on the repetitive loss list (bRL**)**

bRL = the number of buildings that are listed on FEMA's repetitive loss list that have been acquired, relocated, or otherwise removed from the flood problem site they occupied

bRL credits those repetitive loss properties that have been acquired, relocated, or otherwise removed from the site where they suffered flooding. A repetitive loss building receives twice the credit of a non-repetitive loss property. Section 501 explains the FEMA repetitive loss list. Communities with one or more properties on the repetitive loss list must review and update the list at each verification visit.

Credit Criteria

- (1) Credited buildings must be on FEMA's updated repetitive loss list for the community (see Section 501). Properties in mapped repetitive loss areas that are not on the list do not qualify for bRL (but may qualify for bAR if they are in the regulatory floodplain).
- (2) The FEMA repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.
- (3) Buildings counted toward one of the other elements in Activity 520 are not counted toward bRL. For example, if the community acquired and cleared 32 buildings from the SFHA and 5 of them were repetitive loss properties, bAR = 27 points and bRL = 5 points.
- (4) To be credited toward bRL, the building may be located anywhere in the community, including outside the regulatory floodplain.
- (5) A community with no properties on the FEMA repetitive loss list is not eligible for this credit.

522.c. Severe Repetitive Loss properties (bSRL**)**

bSRL = the number of Severe Repetitive Loss properties that have been acquired, relocated, or otherwise removed from the flood problem site they occupied

bSRL credits those Severe Repetitive Loss properties that have been acquired, relocated, or otherwise removed from the site where they suffered flooding. A Severe Repetitive Loss building receives three times the credit of a non-repetitive loss property.

Severe Repetitive Loss properties are a subset of the community's repetitive loss properties. They are explained in Figure 500-1 in Section 501 and have a special identifier in the community's repetitive loss list. Because they have been particularly hard hit by repetitive flooding, they receive more credit under this element if they are acquired or relocated.

Credit Criteria

- (1) Credited buildings must be designated as Severe Repetitive Loss properties on FEMA's updated repetitive loss list for the community (see Section 501).
- (2) The FEMA repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.
- (3) Buildings counted toward one of the other elements are not counted toward bSRL. For example, if the community acquired and cleared 32 buildings from the SFHA and 3 of them were repetitive loss properties and 2 of them were Severe Repetitive Loss properties, bAR = 27 points, bRL = 3 points, and bSRL = 2 points.
- (4) To be credited toward bSRL, the building may be located anywhere in the community, including outside the regulatory floodplain.
- (5) A community with no Severe Repetitive Loss properties on the FEMA repetitive loss list is not eligible for this credit.

Example 522.a-1.

A check of building permit records since the community's initial FIRM date has shown that 36 buildings were acquired or relocated out of the SFHA. Three properties were acquired with funding support from FEMA's former Section 1362 buyout program and three with funds from the Pre-Disaster Mitigation Program. Eighteen homes in the regulatory floodplain were bought and cleared as part of a community flood mitigation project. Eight buildings were demolished to make way for a ballfield expansion. Three people have moved their homes to higher ground on their lots outside the regulatory floodplain and above the base flood elevation, and the community purchased easements to keep the flood-prone portions of the lots open. One elementary school was relocated outside the 500-year floodplain and the land was sold to the local park district.

Of the 35 homes, 15 are on the repetitive loss list. Three of the 15 were Severe Repetitive Loss properties. The community used a copy of the tax assessor's map to show the location of each of the 35 properties.

bAR = 20

bRL = 12

bSRL = 3

bCF = 1 (because the school is a critical facility)

The community supplied the necessary documentation to show that all 36 acquired properties qualify for OSP credit under Activity 420 (Open Space Preservation).

522.d. Critical facilities (bCF)

The credit for this element is based on the number of critical facilities acquired or relocated.

bCF = number of critical facilities that have been acquired, relocated, or otherwise cleared from the regulatory floodplain since the effective date of the FIRM

A critical facility building receives twice the credit of a bAR building.

Credit Criteria

- (1) For bCF credit, critical facilities must have been acquired or relocated, since the effective date of the FIRM. “Critical facilities” are defined in Section 120, Glossary.
- (2) The critical facility must have been located in either the regulatory floodplain or the 500-year floodplain mapped on the current FIRM or on a published preliminary FIRM, whichever shows the larger 500-year floodplain. Critical facility buildings must have been relocated outside the 500-year floodplain.

522.e. Buildings located in the V Zone or coastal A Zone (bVZ)

The credit for this element is based on the number of buildings from the V Zone or coastal A Zones that have been acquired or relocated.

bVZ = number of buildings that have been acquired, relocated, or otherwise cleared from the V Zone, regulated coastal A Zones, or regulated land included within the Limit of Moderate Wave Action (LiMWA) since the effective date of the FIRM

These buildings receive 50% more credit than a building in an A Zone (bAR).

Credit Criteria

- (1) For bVZ credit, buildings must have been acquired, relocated, or otherwise cleared from the V Zone as shown on the current FIRM or on a published preliminary FIRM if adopted by the community. bVZ can also include buildings cleared from the area designated as a coastal A Zone or LiMWA, provided the community is receiving credit for regulating that area under CAZ in Activity 430 (Higher Regulatory Standards).

(2) Acquired, relocated, or otherwise cleared buildings located in the V Zone or coastal A Zone are counted under bVZ, not under bAR.

523 Credit Calculation

There are two options for calculating the total value for this activity. The first, Option 1, is easier to use, but its total is limited to 190 points. Option 2 allows for higher credit, but it favors communities that have cleared more than a small percentage of the buildings in their SFHA. Option 1 produces more credit for large communities or for a community that has cleared a small number of properties.

A community may use whichever option provides the most credit. The maximum credit for c520 using Option 1 is 190 and using Option 2 is 2,250 (including the bonus credit).

523.a. Option 1

$$c520 = (bAR \times 3) + (bRL \times 6) + (bSRL \times 9) + (bCF \times 6) + (bVZ \times 4.5)$$

The maximum credit under Option 1 is 190 points.

Example 523.a-1.

Using the buildings in Example 522.a-1:

$$bAR = 20$$

$$bRL = 12$$

$$bSRL = 3$$

$$bCF = 1$$

$$bVZ = 0$$

The community has 2,000 buildings in the SFHA, so it uses Option 1.

$$\begin{aligned} c520 &= (bAR \times 3) + (bRL \times 6) + (bSRL \times 9) + (bCF \times 6) + (bVZ \times 4.5) \\ &= (20 \times 3) + (12 \times 6) + (3 \times 9) + (1 \times 6) + (0 \times 4.5) \\ &= 60 + 72 + 27 + 6 + 0 = 165 \end{aligned}$$

523.b. Option 2

The maximum credit under Option 2 is 2,250 points.

The credit calculation under Option 2 is based on the credit for all the buildings that have been acquired or relocated expressed as a percentage of all the buildings in the

SFHA (bSF). If the SFHA is cleared out, c520 = the maximum of 2,250 points. This is done in two steps:

- Step 1 calculates the credit based on 1,900 points. Step 1 cannot exceed 1,900.
- Step 2 adds bonus points based on how much of the SFHA has been cleared out. Step 2 only applies if more than 30% of the buildings in the SFHA have been removed.

$$c520 = \text{the credit for Step 1} + \text{the credit for Step 2}$$

(1) Option 2, Step 1.

Step 1 =

$$1,900 \times \frac{(bAR + (bRL \times 2) + (bSRL \times 3) + (bCF \times 2) + (bVZ \times 1.5))}{bSF + bAR + bRL + bSRL + bCF + bVZ}$$

where bSF = the number of buildings in the SFHA

- (a) The value for bSF is the number of buildings CURRENTLY in the SFHA. bSF does not include buildings that have been removed from the SFHA (e.g., buildings that are counted in bAR, bRL, etc.). bSF does include buildings that have been constructed in or annexed into the SFHA since the projects were completed. Note that communities are required to calculate and keep track of bSF as part of their annual recertification (see Section 213.a).

There is a separate formula for calculating bSF in communities with a large number of post-FIRM buildings. It can be found in Section 302.b.

- (b) The denominator includes bSF PLUS all buildings that have been acquired or relocated (bAR, bRL, etc.). As more buildings are removed, the credit increases because numbers are added to bAR, bRL, etc. This means that the ratio gets larger, and so does the credit for 520.

However, communities should note that if development is allowed in the SFHA, even if it is in compliance with the NFIP requirements, credit for this activity may decrease over time as bSF in the denominator increases.

- (c) It should be noted that bAR buildings are in the regulatory floodplain while bSF buildings are only in the SFHA as shown on the FIRM. If a community maps and regulates non-SFHA flood problem areas, it can also count buildings acquired or relocated from those areas towards bAR. This will result in a higher credit.

Example 523.b-1.

This example uses the same numbers as the Option 1 example. The difference is that the total number of buildings currently in the SFHA is smaller, bSF = 400.

$$bAR = 20$$

$$bRL = 12$$

$$bSRL = 3$$

$$bCF = 1$$

$$bVZ = 0$$

$$\begin{aligned} c520 \text{ (Step 1)} &= 1,900 \times \frac{20 + (12 \times 2) + (3 \times 3) + (1 \times 2) + (0 \times 1.5)}{400 + 20 + 12 + 3 + 1 + 0} \\ &= 1,900 \times \frac{20 + 24 + 9 + 2 + 0}{436} \\ &= 1,900 \times \frac{55}{436} = 1,900 \times 0.13 = 247 \end{aligned}$$

Example 523.b-2.

After a severe hurricane, a coastal community cleared 160 damaged buildings from its regulatory floodplain. There are 75 buildings left in the SFHA.

$$bAR = 110; \text{ 10 of these were outside the SFHA, but within the regulatory floodplain}$$

$$bRL = 15; \text{ all of these were in the SFHA}$$

$$bSRL = 0$$

$$bCF = 0$$

$$bVZ = 35$$

$$bSF = 75$$

$$\begin{aligned} c520 \text{ (Step 1)} &= 1,900 \times \frac{110 + (15 \times 2) + (0 \times 3) + (0 \times 2) + (35 \times 1.5)}{75 + 110 + 15 + 0 + 0 + 35} \\ &= 1,900 \times \frac{110 + 30 + 0 + 0 + 52.5}{235} \\ &= 1,900 \times \frac{192.5}{235} = 1,900 \times 0.82 = 1,556.38 \end{aligned}$$

(2) Option 2, Step 2 applies if the community has acquired or relocated more than 30% of the buildings in its current SFHA. Some of the buildings counted toward bAR, bRL,

bSRL, bCF, and bVZ may not have been in the SFHA. For example, some could be in the regulatory floodplain outside the SFHA, and repetitive loss buildings could be in the X Zone. Step 2 only considers buildings in the SFHA, so the community needs to count the number of buildings acquired or relocated out of the SFHA (bARSF). Each building is counted once. There is no extra credit for repetitive loss properties, critical facilities, or buildings in the V Zone.

$$\text{Step 2} = \frac{((\text{bARSF} \times 100) - 30)}{\text{bSF} + \text{bARSF}} \times 5, \text{ where}$$

bARSF = the number of buildings acquired or relocated out of the SFHA

Example 523.b-3.

Of 436 buildings in the SFHA, the community in Example 523.b-1 cleared 36 buildings. Since it cleared only 8% of its SFHA buildings, Step 2 = 0.

$$\text{c520} = \text{the credit for Step 1} + \text{the credit for Step 2} = 247 + 0 = 247$$

Example 523.b-4.

The coastal community that cleared 160 buildings counted those that had been in the SFHA:

100 of the 110 buildings that were counted toward bAR

All 15 of the buildings that were counted toward bRL

All 35 of the buildings in the V Zone

Therefore, 150 buildings were removed from the SFHA.

$$\text{bARSF} = 150$$

$$\text{bSF} = 75$$

$$\text{Step 2} = \frac{((\text{bARSF} \times 100) - 30)}{\text{bSF} + \text{bARSF}} \times 5 = \frac{((150 \times 100) - 30)}{75 + 150} \times 5$$

$$= \frac{(15,000 - 30)}{225} \times 5 = (66.67 - 30) \times 5 = 36.67 \times 5 = 183.35$$

$$\text{c520} = \text{the credit for Step 1} + \text{the credit for Step 2}$$

$$= 1,556.38 + 183.35 = 1,739.73 = 1,740$$

524 Documentation Provided by the Community

a. At each verification visit,

- (1) A map showing the location of parcels where buildings have been demolished or relocated since the effective date of the FIRM and the total number of such buildings (bAR, bRL, bSRL, bCF and bVZ).

The map must show the community's regulatory floodplain boundaries, which include the SFHA, any LiMWA regulated areas, and any additional floodplain subject to the community's regulations. The SFHA is as shown on the current FIRM or on a published preliminary FIRM, whichever shows the larger floodplain.

This map may be the same one used for documentation of open space credit under Section 424.d under Activity 420 (Open Space Preservation). It need only show the part of the community from which buildings have been cleared. It should show lot boundaries. The map will also be used by the ISO/CRS Specialist to check the sites during the verification visit.

- (2) Documentation that shows that each site credited under this activity can also qualify for credit in Activity 420. For properties in the regulatory floodplain, this may be done by applying for open space preservation (OSP) credit. For repetitive loss or Severe Repetitive Loss properties outside the regulatory floodplain, separate documentation is needed.
- (3) Calculations showing the total number of buildings in the SFHA (bSF). The variable bSF represents the number of buildings in the SFHA at the time of verification of this credit. It is discussed in detail in Section 302.
- (4) [For each parcel counted toward bAR or bCF that is located in the regulatory floodplain, but outside the SFHA] Documentation showing that floodplain regulations are in effect in the area.
- (5) [For each parcel that is credited toward bRL or bSRL] Documentation and a marked-up form AW-501 to update the repetitive loss data base, as explained in Section 501.
- (6) [For each parcel counted toward bCF] A description of the demolished or relocated critical facility to demonstrate that the facility meets the critical facility definition for CRS purposes. [For each parcel counted toward bCF that had the building relocated] Documentation that demonstrates that it has been relocated outside the 500-year floodplain.
- (7) Documentation of the implementation date for each project for which new credit is requested. A project is the building or group of buildings acquired or relocated within the same grant award, contract, or scope of work. A completed CC-520EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Acquisition and Relocation Projects, is needed for projects implemented after the implementation date of the 2013 *Coordinator's Manual* (see Section 507) The certification form can be found in Appendix F.

- (8) Identification of which properties if any, were cleared with support from FEMA's Flood Mitigation Assistance (FMA) program.

525 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/500.
- b. There are several possible sources of financial assistance for acquiring and relocating flood-prone properties, which are mentioned in Section 505.
- c. *Property Acquisition Handbook for Local Communities*, FEMA-317, 2007, is a "how-to" guide to help communities work through property acquisition. This handbook also contains a toolkit with tools and forms, including checklists, fact sheets, and briefing notes, to aid the process. It can be found at www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1654.

526 Related Activities under the Community Rating System

- A first step to working with a property owner is to provide property protection advice that includes a discussion of alternatives and sources of financial assistance. This is credited under Activity 360 (Flood Protection Assistance).
- A prerequisite for Activity 520 credit is that the property that has been cleared must meet the OSP criteria for preserved open space under Activity 420 (Open Space Preservation). All such properties should receive OSP credit. If the properties were cleared with FEMA mitigation funds, they should also qualify for deed restriction (DR) credit.
- A floodplain management plan (FMP) or a repetitive loss area analysis (RLAA) credited under Activity 510 (Floodplain Management Planning) can identify projects for acquisition or relocation. The RLAA can identify properties that receive bonus credit in Activity 520.
- A multi-hazard mitigation plan credited under Activity 510 (Floodplain Management Planning) is a prerequisite for FEMA funding for creditable acquisition or relocation projects.

530 FLOOD PROTECTION—Summary

Maximum credit: 1,600 points

Of the 1,600 points, credit for sewer backup protection projects is limited to 200 points and flood control techniques are limited to 1,000 points.

532 Elements

- a. **Flood protection project technique used (TU_u):** Credit is provided for retrofitting techniques or flood control techniques.
 - **Retrofitting technique used:** Points are provided for the use of elevation (TUE), dry floodproofing (TUD), wet floodproofing (TUW), protection from sewer backup (TUS), and barriers (TUB)
 - **Structural flood control technique used:** Points are provided for the use of channel modifications (TUC), and storage facilities (TUF).
- b. **Flood protection improvement (FPI):** Credit points are determined for the difference between the level of flood protection provided before and after the project.
- c. **Protected buildings (PB):** The value of TU is multiplied by the value of FPI for each building and used in the credit calculation.

Credit Calculation

There are two options for calculating the total points. Option 1 is used if the number of buildings eligible for credit is a small percentage of the total number of buildings in the floodplain. The maximum credit for Option 1 is 160 points.

Option 2 is used if the number of buildings eligible for credit is a larger percentage of the total number of buildings in the floodplain. The maximum credit for Option 2 is 1,600 points.

Impact Adjustment

There is no impact adjustment for this activity.

Documentation Provided by the Community

The documentation needed for this activity is described in Section 534.

530 FLOOD PROTECTION

The OBJECTIVE of this activity is to protect buildings from flood damage by

- Retrofitting the buildings so that they suffer no or minimal damage when flooded, and/or
- Constructing small flood control projects that reduce the risk of flood waters' reaching the buildings.

531 Background

Acquisition and relocation of flood-prone buildings is the surest method of both reducing flood damage and keeping people out of harm's way. It is credited under Activity 520 (Acquisition and Relocation). However, existing buildings can be protected on site, especially from shallow, slow-moving flood waters, by implementing one or more flood protection techniques.

This activity provides credit for buildings located in the floodplain that have been protected from flood damage by being retrofitted or by the placement of certain types of flood control structures that protect building(s) to at least the 25-year flood level.

531.a. Activity Description

This credit is based on the number of insurable buildings in the regulatory floodplain that have been retrofitted since the date of the community's original Flood Insurance Rate Map (FIRM). For the purposes of this activity, an accessory structure such as a garage or shed is not counted as an insurable building. Extra credit is given for protecting buildings on Federal Emergency Management Agency's (FEMA's) repetitive loss list (see Section 501) and for protecting buildings that are critical facilities.

Flood protection techniques used (TU) that are recognized by this activity include retrofitting projects and structural flood control projects (see Figure 530-1). The credit points are based on the effectiveness of the technique in preventing flood damage. The most effective techniques are elevation and those measures designed by a registered design professional.

Retrofitting projects, such as

- Elevating buildings above predicted flood levels,
- Dry floodproofing,
- Wet floodproofing,
- Protecting basements from sewer backup, and
- Barriers (for individual structures only), including levees, berms, and floodwalls.

Structural flood control projects, such as

- Channel modifications, including enlarging bridges and culverts;
- Storm drain improvements, including enclosing open channels;
- Diversions and other structural projects; and
- Small reservoirs, including retention and detention basins.

Figure 530-1. Flood protection techniques credited under Activity 530.

531.b. Activity Credit Criteria

The following criteria must be met to receive credit for this activity.

- (1) All projects: Each flood protection project (retrofitting technique or structural flood control technique) must meet the following criteria:
 - (a) The protected building(s) must be an insurable building(s) (see Section 301);
 - (b) The project must have been completed after the effective date of the initial FIRM;
 - (c) The project must protect the building(s) from at least the 25-year flood;
 - (d) All required permits must have been issued for the project or the local permit officer must state in writing that the project complies with all federal, state, and local codes and regulations;
 - (e) For critical facilities, to receive the bonus credit the buildings must be protected to at least the 500-year flood level;
 - (f) If the project requires human intervention, there must be at least one hour of flood warning time plus the time it takes to install the measure. “Human intervention” means that a person is needed at the site to close an opening or install or operate a protection device before flood waters reach the building; and
 - (g) Credit is not provided for a retrofitted building or flood control project that is in disrepair or does not appear to be maintained.
- (2) Retrofitting projects: In addition to the criteria in Section 531.b(1), the design of retrofitting projects for buildings located in the following high hazard areas must be signed and sealed by a registered design professional:
 - (a) V Zones, coastal A Zones, and areas seaward of the LiMWA;
 - (b) Areas with velocities greater than 5 feet per second during the 100-year event; and
 - (c) Areas subject to any of the special flood-related hazards listed in Section 401.
- (3) Flood control projects: In addition to the criteria in Section 531.b(1), structural flood control projects must meet the following:
 - (a) The design and construction of the project must have been certified by a licensed professional engineer;
 - (b) The responsible agency must be implementing an operations and maintenance plan that was prepared for the project by a licensed professional engineer;
 - (c) If the flood control project lowers the base flood elevation shown on the FIRM, a Letter of Map Revision (LOMR) must be submitted to FEMA, as required by the regulations of the National Flood Insurance Program (NFIP) at 44 *CFR* §65.3;

- (d) The community must ensure that the impact of future development will not adversely affect the project's flood protection level. This can be done by either
 - (i) Enforcing watershed-wide regulations that prevent increases in stormwater runoff. This can be documented by receipt of credit for stormwater management regulations under Activity 450 (Stormwater Management) (i.e., credit for SMR or WMP with an impact adjustment of 1.0 for the watershed upstream of the project). The design storm (DS) must be at least as large as the flood protection level for the project; or
 - (ii) Designing the project so that it will perform to its design protection level based on a watershed that is fully built out or developed in accord with an adopted long-range land use plan. The community must document that the protection level is still valid at each cycle verification; and
- (e) Additional documentation may be required for the review of flood control projects that are unique to a community or region.

(4) Environmental compliance: Flood protection projects must adhere to applicable federal environmental and historic preservation laws and executive orders (see Section 507). CC-530EHP, Flood Protection, is a form on which the community certifies its compliance. The appropriate portions of the certification must be completed for all projects permitted or implemented after the effective date of the 2013 *CRS Coordinator's Manual*. CC-530EHP can be found in Appendix F or at www.CRSresources.org. Credit is not provided if the project was not in compliance with applicable federal laws and executive orders.

Environmental Protection and Historic Preservation

Because it is a FEMA program, the CRS must ensure that activities for which it provides credit are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA's policy. Figure 500-5 lists the federal programs that should be considered during project development.

- (5) Projects not credited: The following projects are NOT credited under this activity:
- (a) Projects that protect to less than the 25-year flood level;
 - (b) Projects that protect buildings outside of the regulatory floodplain (except repetitive loss buildings);
 - (c) Post-FIRM buildings. Credit is not provided for post-FIRM buildings because the NFIP already requires that they be protected. However, if a post-FIRM building was retrofitted to protect it from a flood hazard not covered by the FIRM or NFIP regulations, credit is provided under this activity. For example, a post-FIRM building may have been constructed to the base flood elevation shown on an old FIRM, but the current base flood elevation is higher because of a recent restudy. If the building is elevated again to protect to the new base flood elevation, then the

community could receive Activity 530 credit. However, constructing a new building to meet the community's flood protection requirements is not retrofitting;

- (d) Projects implemented due to a requirement of the NFIP, such as elevating a substantially damaged or substantially improved residential building. The following are examples of how this rule is applied:
- (i) Although elevating a building solely to meet the NFIP rules is not credited, credit is provided for bringing a noncompliant building into compliance if the project was implemented voluntarily or pursuant to a community action, such as providing financial assistance or declaring a dilapidated structure to be unsafe and uninhabitable.
 - (ii) If a noncompliant building is removed, and replaced with a new building constructed to post-FIRM standards, it can be counted toward TU1. Demolishing and replacing a substantially improved or substantially damaged is not an NFIP requirement.
 - (iii) Projects constructed to mitigate the adverse effect of not properly regulating new construction in accordance with a court order or an agreement with FEMA are not credited. Such an action would be considered one taken to meet the minimum requirements of the NFIP;
- (e) If a building is removed but not replaced, and the parcel is preserved as open space, it can be counted toward credit under Activity 520 (Acquisition and Relocation). If a building is removed but not replaced, and the parcel is not preserved as open space, it can be counted toward TU1 because local codes will ensure that if anything is constructed, it will meet post-FIRM standards;
- (f) Coastal structural projects, including seawalls, groins, and beach nourishment;
- (g) Levees or floodwalls that protect more than one property. Levees are covered under Activity 620 (Levees);
- (h) Dams that are not in compliance with the state's dam safety regulations; and
- (i) Structural flood control projects owned AND operated by a federal agency. Credit is not provided for the major flood control works owned and operated by agencies such as the U.S. Army Corps of Engineers, Tennessee Valley Authority, and the Bureau of Reclamation. However, credit is provided for locally owned and operated projects that were partially funded by a federal agency.
- (6) Regulatory floodplain: Credit is provided for buildings in the Special Flood Hazard Area (SFHA) shown on the current FIRM or preliminary FIRM, whichever is larger.

If the community has prepared an Impact Adjustment Map in accordance with Section 403 that shows flood-prone areas subject to regulation outside of the SFHA, then buildings in that regulatory floodplain may be counted for this credit. The community must demonstrate that these areas are currently regulated to at least the minimum standards of the NFIP.

A building that lies outside the regulatory floodplain because of remapping, completion of a flood control structure, or other activity is not eligible for this credit. Such a building has already benefited twice: it does not have a mandatory NFIP insurance purchase requirement; and if the owner chooses to purchase NFIP insurance, the premium will be based on the lower X-Zone rate.

532 Elements

The credit for Activity 530 is based on the combination of flood protection techniques used and the level of flood protection provided. Points are calculated for each protected building. Bonus points are provided for the protection of repetitive loss buildings and critical facilities. Credit is based on the elements described below.

532.a. Flood protection project technique used (TU)

Credit is provided for each building that has been protected by a retrofitting technique or a flood control project technique. It is symbolized as TU or, when a specific technique is being discussed, as TU plus another letter, such as TUE. Each building protected by a project will have a TU value. The value of TU is based on the technique used for each building and varies based on factors such as whether the project was designed by a registered design professional. The credited techniques (and the acronyms used for them) are shown in the Table 530-1.

Table 530-1. Flood protection techniques used.	
Acronym (TU_)	Technique Used
TUE	Elevation
TUD	Dry floodproofing
TUW	Wet floodproofing
TUS	Sewer backup
TUB	Barrier, levee, or floodwall
TUC	Channel modification, storm sewer improvements, diversions
TUF	Storage facilities

The variation in the value for the technique used is based on the reliability of the project to prevent flood damage. For example, dry floodproofing is a less reliable retrofitting approach than elevation, so it is not worth as many points. Other methods and variations on these methods can be submitted for review to determine the credit points.

TU_#i = the type of technique used for building i

(1) Retrofitting technique used:

The value of the technique used is based on the retrofitting technique used. Credit criteria in Section 531.b must be met.

(a) TUE: Technique used for elevated buildings:

TUE = 1.0, if the building is elevated

(b) TUD: Technique used for buildings that are dry floodproofed (i.e., the walls and floor are made watertight so flood water does not enter the building):

TUD = 0.6, if the project was designed by a registered design professional and the design accounts for openings, internal drainage, seepage, and underdrainage

TUD = 0.4, if the project does not depend on human intervention to close openings; the project protects to a level less than 3 feet above the first floor; the design accounts for internal drainage, seepage, and underdrainage; and the building has no basement (i.e., any floor below grade on all sides)

TUD= 0.2, for all other cases, including those for which there is no documentation of how openings, interior drainage, seepage, or underdrainage are handled

(c) TUW: Technique used for buildings that are wet floodproofed (i.e., flood water is allowed into the building, but measures are taken to minimize damage):

TUW = 0.5, if the project was designed by a registered design professional

TUW = 0.3, if the project was not designed by a registered design professional

TUW = 0.2, if the furnace, water heater, electrical breaker box, and other utilities are relocated above flood level

(d) TUS: Technique used for buildings that are protected from sewer or sump backup:

TUS = 0.2, if the building is located in the SFHA

TUS = 0.1, for sewer backup prevention measures if the building is located outside of the SFHA and the community has a building code or other regulations that require positive drain sewers or other measures that prevent sewer backup into new buildings

A maximum of 200 points is provided under this activity for sewer backup prevention measures outside of the SFHA.

(e) TUB: Technique used for buildings protected by a barrier, including a levee, berm, or floodwall:

The following conditions must be met.

(i) The barrier must be located entirely on the property of the owner of the protected building(s).

This requirement ensures that those who are protected will maintain the levee or floodwall. When a barrier protects several neighbors but one of them neglects maintenance, all the properties are placed in jeopardy.

A barrier entirely on property owned by a condominium association would meet this requirement, but one on property owned by a homeowner's association that protects several privately owned homes would not.

(ii) The barrier must either have no openings (e.g., access is gained by going over the wall), have openings that close without human intervention, or have a written plan and adequate warning time so that available personnel are able to close the openings.

TUB = 0.8, if the barrier was designed, and the construction approved by, a registered design professional, and the design accounts for interior drainage, seepage, and underdrainage

TUB = 0.4, if the barrier was not designed by a registered design professional, but the design accounts for interior drainage, seepage, and underdrainage

(2) Structural flood control technique used (Maximum credit: 1,000 points):

The value of the technique used is based on the structural flood control technique. If more than one technique is used to protect a building, then TU = the lower of the techniques' values. Credit criteria in Section 531.b must be met.

- (a) TUC: Technique used for buildings protected by a channel modification project, including diversions, enlarging bridges and culverts, and storm drain improvements:

A registered design professional must design the project and certify that no buildings are located in areas that would be affected by any increases in flood elevations caused by the project.

TUC = 0.8, if the project design provides at least one foot of clearance between the flood protection level and bridge decks, top of pipe, and other obstructions

TUC = 0.7, for pump systems and all other cases

- (b) TUF: Technique used for buildings protected by a reservoir, detention basin, retention pond, or other flood water storage facility

TUF = 0.8, for all flood water storage facilities

If the flood water is stored behind a dam or other above-ground containment structure, then the community must document that the structure meets all state dam safety requirements. If the state does not have a dam safety program, then a registered design professional must certify that the structure meets the Corps of Engineers' dam safety criteria.

532.b. Flood protection improvement (FPI)

Flood protection improvement is a measure of the enhanced flood protection that a given project provides for a given building. It is symbolized as FPI#i.

Credit Calculation

For buildings on which any other flood protection measure was used, the credit is adjusted for the flood protection improvement provided to each building.

$FPI\#i = FPP\#i - FPB\#i$, where

FPI#i = flood protection improvement for building i,

FPP = flood protection provided by the project, and

FPB = flood protection level before the project was constructed

The values for FPP and FPB are shown in Table 530-2.

Table 530-2. Values for FPP and FPB	
Flood Protection Level	FPP or FPB
Less than the 10-year flood	0.0
10-year flood, but less than the 25-year flood	0.3
25-year flood, but less than the 50-year flood	0.5
50-year flood, but less than the 100-year flood	0.7
100-year flood	0.8
100-year flood plus one foot of freeboard	0.9
100-year flood plus two or more feet of freeboard	1.0
500-year flood	1.0

The minimum value for FPP is 0.5. There is no credit for flood protection measures that protect to less than the 25-year flood level. For a repetitive loss property, it is assumed that the property was subject to flooding more frequent than every 10 years (less than the 10-year event), so FPB = 0. If the value of FPB cannot be determined (e.g., from Elevation Certificates or flood profiles), then it will be assumed that a 25-year flood protection level existed before the project (FPB = 0.5).

The flood protection level of a barrier is one foot below the top of the barrier.

If a basement is protected from sewer backup by an overhead sewer or backup valve, then FPP = 1.0.

Example 532.b-1.

- (a) A building on a crawlspace was elevated from the 10-year flood elevation to two feet above the 100-year flood elevation.

FPP = 1.0, FPB = 0

$$FPI = FPP - FPB = 1.0 - 0 = 1.0$$

- (b) A building has been protected by a 25-year berm (changing its protection level from 0 to the 25-year flood level).

$$FPP = 0.5, FPB = 0$$

$$FPI = FPP - FPB = 0.5 - 0 = 0.5$$

- (c) A channel improvement lowers the 100-year flood by two feet. The buildings are now protected from the 100-year flood. Before the project the buildings were subject to flooding during the 50-year flood. The community applied to FEMA for a LOMR. Because the LOMR will result in the removal of the buildings from the SFHA there is no credit under this activity for the project. The community receives a lower base flood elevation and a smaller SFHA as the benefit.

Buildings that were in the community's regulatory floodplain will be in the X Zone and benefit from X-Zone insurance premiums. Buildings that remain in the SFHA are credited for the flood protection provided (see (d), below).

- (d) Another building closer to the stream is affected by the same channel improvement. The two-foot drop in flood levels means that this building is now subject only to the 60-year flood instead of the 35-year flood. For that building,

$$FPP = 0.7, FPB = 0.5$$

$$FPI = FPP - FPB = 0.7 - 0.5 = 0.2$$

532.c. Protected buildings (PB)

A PB value is calculated for each protected building. It is the product of the TU value for each building multiplied by the FPI value for that building.

$$PB_i = TU_{_} \times FPI_{\#i} \text{ for each building protected using one or more of the techniques described in Section 531.a}$$

$$PB = \text{the sum of all } PB_{\#i}$$

In the formula above, the letter "i" represents a given building. $TU_{\#i}$ is the credit for the flood protection technique used to protect building "i." The "_" stands for the letter for the technique used in Section 532.a (TUE, for example). When the formulae are completed, $TU_{\#1}$ and $FPI_{\#1}$ will be the credits for building number 1. For example, if building number 24 were elevated, its credits would be $TUE_{\#24}$ and $FPI_{\#24}$. Their product is

PB#24. If there are 52 protected buildings to be credited, then $PB = \sum PB\#1$ through PB#52 or the sum of the values for buildings #1 through #52.

The values for some protected buildings are modified by multipliers as follows.

- (1) Repetitive loss property multiplier: If a protected building in the regulatory floodplain is also on the FEMA repetitive loss list, it is counted twice toward PB. If a protected building outside of the regulatory floodplain is also on the FEMA repetitive loss list, it is counted once toward PB.

Section 501 explains the FEMA repetitive loss list. It is a list of properties that have received multiple flood insurance claims. Communities with one or more properties on the repetitive loss list must review and update the list at each verification visit (see Section 211).

- (2) Severe Repetitive Loss property multiplier: If a protected building is a Severe Repetitive Loss property and lies within the regulatory floodplain, it is counted three times toward PB. If a protected building lying outside the regulatory floodplain is also a Severe Repetitive Loss property, it is counted twice toward PB.

Multipliers (1) and (2) are provided only if the flood protection measure was sufficient to remove the property from the repetitive loss list. The repetitive loss data base must be updated to reflect the mitigation project, as explained in Section 501.

A community with no properties on the FEMA repetitive loss list is not eligible for these extra credits.

- (3) Critical facilities multiplier: If a protected building is a critical facility it will receive credit based on the level of protection provided. If the flood protection provided (FPP) is the 500-year flood level or higher, critical facilities buildings are counted twice toward PB (bonus credit). The critical facility must be located in either the regulatory floodplain or the 500-year floodplain on the current FIRM or published preliminary FIRM, whichever shows a larger 500-year floodplain. For CRS credit purposes, “critical facilities” are defined in Section 120 (Glossary).

- (4) Flood Mitigation Assistance grant multiplier: If a building was protected with funding support from FEMA’s Flood Mitigation Assistance program, then the credit is 0.25 times the value of PB. This is explained in Section 506.

A checklist is available at www.CRSresources.org/500 to help track retrofitted properties and their multipliers.

Example 532.c-1.

A community has protected 29 buildings from varying levels of flooding. Twenty buildings are protected from the 50-year flood with a channel improvement, and eight buildings subject to flooding every 10 years have been elevated above the 100-year flood level.

The public works garage is on the edge of the SFHA, above the 10-year flood level, but subject to shallow flooding during a 100-year flood. The department constructed a barrier around it to protect it from the 500-year flood. All buildings and projects meet the credit criteria of Sections 531.b and 532 for the technique used.

Three of the elevated buildings are on FEMA's repetitive loss list and a fourth is a Severe Repetitive Loss property. The public works garage is considered a critical facility because it is needed during a flood fighting operation.

For the 20 buildings protected from the 50-year flood by the channel improvement,

$$TUC\#1\text{--}\#20 = 0.8; FPP\#1\text{--}\#20 = 0.7; FPB\#1\text{--}\#20 = 0$$

$$FPI\#1\text{--}\#20 = FPP\#1\text{--}\#20 - FPB\#1\text{--}\#20 = 0.7 - 0 = 0.7$$

$$PB\#1\text{--}\#20 = TUC\#1\text{--}\#20 \times FPI\#1\text{--}\#20 = 0.8 \times 0.7 = 0.56$$

$$\sum PB \text{ for 20 buildings} = \sum PB\#1\text{--}\#20 = 20 \times 0.56 = 11.2$$

Eight buildings are elevated to the 100-year flood level. Since there are three repetitive loss and one Severe Repetitive Loss buildings, they are counted as $8 + 3 + 2 = 13$ buildings, and numbered as buildings #21 through #33.

$$TUE\#21\text{--}\#33 = 1.0, FPP\#21\text{--}\#33 = 0.8, FPB\#21\text{--}\#33 = 0,$$

$$FPI\#21\text{--}\#33 = FPP\#21\text{--}\#33 - FPB\#21\text{--}\#33 = 0.8 - 0 = 0.8$$

$$PB\#21\text{--}\#33 = TUE\#21\text{--}\#33 \times FPI\#21\text{--}\#33 = 1.0 \times 0.8 = 0.8$$

$$\sum PB \text{ for 13 buildings} = \sum PB\#21 \text{ through } PB\#33 = 13 \times 0.8 = 10.4$$

The public works garage is protected by a 500-year barrier. Because it is a critical facility, it is counted as two buildings, numbered 34 and 35.

$$TUB\#34\text{--}\#35 = 0.8, FPP\#34\text{--}\#35 = 1.0, FPB\#34\text{--}\#35 = 0.3,$$

$$FPI\#34\text{--}\#35 = FPP\#34\text{--}\#35 - FPB\#34\text{--}\#35 = 1.0 - 0.3 = 0.7$$

$$PB\#34\text{--}\#35 = TUB\#34\text{--}\#35 \times FPI\#34\text{--}\#35 = 0.8 \times 0.7 = 0.56$$

$$\sum PB\#34 \text{ through } PB\#35 = 2 \times 0.56 = 1.12$$

$$PB = \sum PB\#1\text{--}\#35 = 11.2 + 10.4 + 1.12 = 22.72$$

533 Credit Calculation

There are two options for calculating the total value for this activity. The first, Option 1, is easier to use, but its total is limited to 160 points. As long as the projects meet the credit criteria, the values for the technique used (TU_) and flood protection improvement (FPI_) do not need to be calculated for each building. A checklist is available at www.CRSresources.org/500 that can help when there are multipliers that increase the credit for certain buildings.

Option 2 allows for higher credit, but it favors communities that have protected a large percentage of the buildings in their SFHA. Option 1 produces more credit for large communities or communities that have protected a small number of properties. Option 2 calculations can be facilitated by using the checklist found at www.CRSresources.org/500.

A community may use whichever option provides the larger credit. The maximum credit for Activity 530 using Option 1 is 160 and using Option 2 is 1,600.

533.a. Option 1

$$c530 = 2.4 \times \text{the number of buildings that qualify for Activity 530 credit}$$

The maximum credit under Option 1 is 160 points.

Example 533.a-1.

Using the same community as in Example 532.c-1, 29 buildings have been protected from varying levels of flooding.

Three of the elevated buildings are on FEMA's repetitive loss list and a fourth is a Severe Repetitive Loss property. The public works garage is considered a critical facility because it is needed during a flood fighting operation.

Although there are 29 separate structures, the three repetitive loss buildings are counted twice, the Severe Repetitive Loss building is counted three times, and the public works garage is counted twice (because it was protected to the 500-year flood level). As a result, the credit is based on the equivalent of $29 + 3 + 2 + 1 = 35$ buildings.

$$c530 = 2.4 \times 35 = 84$$

533.b. Option 2

The credit calculation under Option 2 is based on the credit for all the buildings that have been protected as a percentage of all the buildings in the SFHA (bSF).

$$c530 = 16 \times \frac{PB \times 100}{bSF}, \text{ where}$$

PB is the sum of all PB_i , and

bSF = the number of buildings in the SFHA

- (1) The value for bSF is the number of buildings currently in the SFHA. bSF includes buildings that have been constructed in or annexed into the SFHA since the projects were completed. Note that communities are required to calculate and keep track of bSF as part of their annual recertification. Note also that if development is allowed in the SFHA, even if it is in compliance with the NFIP requirements, credit for this activity may decrease over time as bSF in the denominator increases.

There is a separate formula for calculating bSF in communities with a large number of post-FIRM buildings. It can be found in Section 303.

- (2) The maximum credit for Option 2 is 1,600.

Example 533.b-1.

Using the same 29 buildings in Example 532.c-1, in a community with a relatively small number of buildings in the SFHA, 125.

$$PB = 22.72, \quad bSF = 125$$

$$c530 = 16 \times \frac{PB \times 100}{bSF}$$

$$= 16 \times \frac{22.72 \times 100}{125} = 16 \times \frac{2,272}{125} = 16 \times 18.18 = 290.82$$

534 Documentation Provided by the Community

(1) At each verification visit,

- (a) [For elevation projects] Copies of the Elevation Certificate for each elevated building.
- (b) [For retrofitting projects other than elevation] A list of all buildings for which credit is requested and a signed Community Certification for Retrofitted Buildings (CC-530).
- (c) [For structural flood control projects]
 - (i) The level of flood protection for each building to be credited, both before and after the project was installed or constructed.
 - (ii) [For buildings protected by a reservoir, detention basin, retention pond, or other facility that stores water above ground] A letter from the state dam safety office stating that the structure meets all state dam safety requirements. If there is no state dam safety office, then a registered design professional must certify that the project meets all appropriate dam safety criteria.
- (d) A map showing the location of all protected buildings for which credit is being requested. This map is not necessarily the same as the Impact Adjustment Map prepared pursuant to Section 403. It need only show the part of the community in which buildings have been protected. The map for this activity does not need to show lot boundaries, unless the same map is used for Activity 520 (Acquisition and Relocation).
- (e) Documentation of the implementation date for each project for which new credit is requested. A project is the building or group of buildings acquired or relocated within the same grant award, contract, or scope of work. A completed CC-530EHP, Certification of Compliance with Environmental and Historic Preservation for Flood Protection Projects, is needed for projects implemented after the implementation date of the 2013 *Coordinator's Manual* (see Section 507). The form can be found in Appendix F or at www.CRSresources.org.
- (f) [If the community is using Option 2 under Section 532.b] Calculations showing the total number of buildings in the SFHA (bSF).

NOTE: The variable bSF must have the same value as bSF in Activities 510, 520, and 610.
- (g) [For credit for protecting non-repetitive loss buildings located outside the SFHA] Documentation that shows that floodplain regulations are in effect in the area outside the SFHA.
- (h) [If the flood control project revised the base flood elevation] A copy of the CLOMR submittal to FEMA.

535 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/500.
- b. FEMA and the Corps of Engineers have many references on elevating and retrofitting buildings. They can be found at www.fema.gov/building-science/building-science-publications-flood/wind and www.usace.army.mil/Missions/CivilWorks/ProjectPlanning/nfpc.aspx.
- c. Several states have published their own floodproofing or retrofitting manuals and some have programs to help fund or otherwise assist property owners. State NFIP Coordinators are listed at www.floods.org/index.asp?menuID=274&firstlevelmenuID=185&siteID=1.
- d. The Emergency Management Institute (EMI) is a FEMA training center located in Emmitsburg, Maryland. It offers a four-day course on retrofitting techniques oriented to engineers and experienced building professionals as well as courses on FEMA financial assistance programs, including application procedures and benefit/cost analyses. Stipends to cover travel, registration, and rooms are usually available from FEMA for federal, state, and local officials. EMI also offers field-deployed and independent study versions of many of its subjects, which are also free. For more information, see the EMI website at <http://training.fema.gov/EMIWeb/>.

536 Related Activities under the Community Rating System

- A first step to working with a property owner is to provide property protection advice that includes a discussion of alternatives and sources of financial assistance. This is credited under Activity 360 (Flood Protection Assistance).
- Flood control projects that change the base flood elevation may result in revisions to the community's FIRM. Such revisions may or may not receive credit under Activity 410 (Floodplain Mapping). Activity 410 lists criteria for credit due to changes in the base flood elevation.
- A floodplain management plan (FMP) or a repetitive loss area analysis (RLAA) credited under Activity 510 (Floodplain Management Planning) can identify projects for flood protection. The RLAA can identify properties that receive bonus credit under Activity 530.
- A multi-hazard mitigation plan credited under Activity 510 (Floodplain Management Planning) is a prerequisite for FEMA funding for creditable retrofitting projects.

540 DRAINAGE SYSTEM MAINTENANCE—Summary

Maximum credit: 570 points

542 Elements

- a. **Channel debris removal (CDR):** Up to 200 points for inspecting public and private drainage systems and removing debris as appropriate.
- b. **Problem site maintenance (PSM):** Up to 50 points for paying special attention to known problem sites, such as those needing more frequent inspections.
- c. **Capital improvement program (CIP):** Up to 70 points for having a capital improvement program that corrects drainage problems.
- d. **Stream dumping regulations (SDR):** Up to 30 points if the community has and publicizes regulations prohibiting dumping in streams and ditches.
- e. **Storage basin maintenance (SBM):** Up to 120 points for annually inspecting public and private storage basins and performing the required maintenance.
- f. **Coastal erosion protection maintenance (EPM):** Up to 100 points for maintaining erosion protection programs in communities with coastal erosion-prone areas as described in *CRS Credit for Management of Coastal Erosion Hazards*.

Credit Criteria

Credit criteria for this activity are described in Section 541.b. They include drainage system inspections and maintenance requirements, no reliance on unsecured outside funding for maintenance, and compliance with federal and state laws and executive orders for environmental and historic preservation.

Each element has additional criteria specific to that element.

Impact Adjustment

The credit for CDR, PSM, and CIP are adjusted based on the percentage of the components of a community's drainage system that is inspected and maintained. There is no impact adjustment for SDR. The credit for SBM is adjusted based on the percentage of the storage basins that is inspected and maintained.

Documentation Provided by the Community

Each element has a separate section describing needed documentation.

540 DRAINAGE SYSTEM MAINTENANCE

The OBJECTIVE of this activity is to ensure that the community keeps its channels and storage basins clear of debris so that their flood carrying and storage capacity are maintained.

541 Background

An area's drainage system consists of natural watercourses or channels, constructed storm drains and ditches, and detention/retention basins built to store high flows. In most cases, the actual channel of a natural stream will carry only the two-year flood, with larger flows being carried in the overbank area. Engineered channels are typically designed to carry larger floods than natural channels. When a drainage system loses a portion of its conveyance or storage capacity, overbank flooding occurs more frequently and flows reach higher elevations, potentially damaging nearby structures or causing increased channel erosion.

Even where floodplain regulations prevent construction from encroaching, channels can lose their carrying capacities as a result of the accumulation of debris, sedimentation, and the growth of vegetation. Detention and retention basins can lose their ability to store water if upstream sediment controls do not function properly or if there are highly erosive lands upstream.

One proven approach to preventing this is a community program that routinely inspects and clears debris from the drainage system. This work can be as simple as cleaning out culverts and removing trash, shopping carts, and similar debris that can dam a stream and cause flooding, even during small storms.

541.a. Activity Description

The maximum credit for Activity 540 is 570 points.

Credit is provided for keeping the channels and storage basins (detention or retention) of a community's drainage system clear of debris in order to maintain their flood carrying and storage capacity during flood events, and to protect water quality.

A separate publication, **CRS Credit for Drainage System Maintenance**, provides an example of a community's maintenance program and credit documentation.

Communities are encouraged to obtain and read this document before applying for this credit. It will improve the quality of the documentation and reduce the need to provide additional documentation later.

To obtain a copy, see Appendix C or www.CRSresources.org.

Activity 540

If a community can answer "yes" to the following questions, it should be able to receive credit for this activity.

- Is there an annual inspection for at least some of the drainage system?
- Are inspections also conducted after major storms and in response to citizens' complaints?
- Are debris and other obstructions to flow or storage removed when they are found?
- Does the drainage maintenance program have written procedures?

A community can receive credit for six drainage system maintenance activities:

- Inspecting and maintaining channels (CDR),
- Paying attention to problem sites (PSM),
- Having a capital improvements program that benefits the drainage system (CIP),
- Implementing and publicizing “no dumping” regulations (SDR),
- Inspecting and maintaining storage basins (SBM), and
- Maintaining coastal erosion protection measures, if applicable (EPM).

The drainage system—A drainage system consists of all natural and manmade watercourses, conduits, and storage basins that collect rainfall and convey flood flows. It includes both open systems and those that are underground.

The conveyance system—For purposes of this activity, the conveyance system includes the channels that need to be maintained in order to prevent damage to buildings, roads, and other infrastructure from small, frequent storms. Components of the conveyance system include the structures and the channel segments throughout the system (e.g., bridges, culverts, and segments of open channel) through which water flows.

The defined conveyance system varies in each community. In some communities, it may be vital to maintain the channels, culverts, and drainage inlets in order to avoid flooding. For other communities, the roadside ditches are significant conveyors of surface water and must be kept clean

This activity is concerned primarily with the parts of the conveyance system that lie within the developed areas of the community. However, drainageways in undeveloped areas of the community also need to be included if there is a culvert or bridge crossing that the community maintains or if there are insurable buildings that could be affected if the drainageway is not maintained.

The areas or locations of flood insurance claims and disaster assistance should be considered when determining the extent of the conveyance system that deserves regular maintenance. In communities with repetitive losses (Category B and C communities as noted in Section 502), the drainage system **MUST** cover those areas having repetitive loss properties if the cause of the losses was local drainage problems or small, frequent storms. In general, all channels with a drainage area of 40 acres or more should be included in the conveyance system and on the map (see below).

NFIP Requirement

The NFIP requires communities to “assure [that] the carrying capacity within the altered or relocated portion of any watercourse is maintained” (44 *CFR* §60.3(b)(7)).

This maintenance provision applies to any watercourse altered or relocated after the date of adoption of the community’s floodplain management ordinance. Any natural growth or manmade debris that reduces the carrying capacity of these artificial channels may be a violation of that ordinance.

In addition, these areas may be remapped by the Federal Emergency Management Agency (FEMA) to reflect the current carrying capacity and potential increased risk to existing development.

Storage basins—For the purposes of this activity, storage basins include all constructed stormwater runoff detention or retention facilities located on public and private property. These include onsite detention or retention as well as infiltration facilities that are required for new development. The community must include all facilities constructed pursuant to stormwater management regulations credited as SMR under Activity 450 (Stormwater Management) and all publicly owned facilities.

Maps and inventories—For this activity, a map of the community’s conveyance system is required for CDR credit and a map of all storage basins within the community is required for SBM credit. Depending on the scale of the map, the map of the conveyance system and the maps of the storage basins may be combined if the community is requesting both CDR and SBM credit.

The conveyance system map must label the drainage system components (structures and channel segments). An inventory or list of the drainage system components is needed to document the annual inspections. Similarly, an inventory of all storage basins, public and private, is needed for SBM credit.

541.b. Activity Credit Criteria

- (1) Drainage system inspections—Credit for this activity is dependent upon annual or regular inspection of the conveyance system and/or storage basins. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. If all components of the drainage system cannot be inspected annually (for example, because there is no legal access to those parts of the system that lie on private property or for budgetary reasons), then credit will be adjusted by the impact adjustment.
- (2) Operations and maintenance—The operations and maintenance of the drainage system can be provided by the community, another non-federal agency, or private property owners. Many communities are in flood control or drainage districts that perform this work. Whether the operations and maintenance are performed by the community; a county, regional or state agency; or a private property owner, the Community Rating System (CRS) community is responsible for providing all the documentation needed to verify credit.
- (3) No credit is provided for projects that rely on unsecured outside funding, such as a special appropriation from the state legislature or approval of a U.S. Army Corps of Engineers clearing-and-snagging project. Secure outside funding, such as an annual state distribution of gasoline tax receipts, is acceptable.

(4) Environmental compliance—The community’s program for drainage system maintenance must be compliant with applicable federal environmental and historic preservation laws and executive orders (see Section 507). The community and other local, regional, and state agencies responsible for portions of the drainage system must complete a CC-540EHP, Certification of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance. The certification form can be found in Appendix F and at www.CRSresources.org. Credit is not provided if local drainage system maintenance procedures are not compliant with applicable federal laws and executive orders.

Environmental Protection and Historic Preservation

The CRS is a FEMA program and therefore must ensure that activities credited by the CRS are compliant with applicable federal environmental and historic preservation laws and executive orders. Section 507 expands on this requirement and presents a summary of FEMA’s policy. Figure 500-5 lists the federal programs that should be considered during project development.

(5) There may be special restrictions on drainage system components or facilities, or requirements to obtain a federal or state permit before certain work can proceed. Often, a “general” or “statewide” permit or other permission can be granted in advance for projects that are specifically described in the permit. Such laws and regulations usually do not preclude all maintenance work, but they may place restrictions on activities that disturb natural or protected areas. These restrictions must be included in the community’s procedures.

542 Elements

542.a. Channel debris removal (CDR)

The maximum credit for this element is 200 points.

Credit for this element is dependent upon annual inspection and regular maintenance of the channels and associated conveyance facilities. The community (or other non-federal agency) must have a program to inspect its drainage facilities annually, upon receiving a complaint, and after each major storm. The community (or other non-federal agency) must remove debris as needed after each inspection in accordance with a written maintenance plan. Neither the cost of the work nor the amount of debris removed affects the credit. While responding to complaints and performing inspections after storm events are required to obtain credit, a program that only responds to complaints or inspects after storms is not eligible for this credit.

To receive full credit for this activity, the community must annually inspect, and maintain as required, all public and private components in the developed portion of the surface conveyance system, not just channels in the floodplain. The impact adjustment determines the final credit, based on the amount of the conveyance system that is covered by the inspection and maintenance program.

The maintenance work is normally done by a public works crew, frequently without heavy equipment. The objective of this activity is to remove accumulated debris that obstructs flows that can cause flooding to adjacent properties. It is important that the community's procedures spell out what can and cannot be removed. In areas with natural streams, for example, a certain amount of woody debris may remain in the channel area without causing a flooding problem. Concrete-lined ditches, by contrast, may need to have all debris removed in order to maintain their carrying capacity.

Credit Criteria

- (1) The activity credit criteria in Section 541.b must be met.
- (2) The community (or other non-federal agency) must have a program to inspect and maintain its drainage facilities, and inspections must be conducted
 - (a) At least once each year,
 - (b) Upon receiving a complaint, and
 - (c) After each major storm.Action must be taken after an inspection identifies a need for maintenance or cleaning.
- (3) The community must provide a map of the conveyance system with components (structures and segments) of the drainage system labeled.
- (4) The community must provide a complete inventory of its conveyance system components.
- (5) Procedures for inspection and maintenance must be in the form of written procedures or guidelines. These are explained in "Drainage System Inspection and Maintenance Procedures," below.
- (6) All the inspection and maintenance activities must be recorded and the records must be maintained until the next verification visit.

Map and Inventory of the Conveyance System

The community must provide a detailed map of the developed areas of the community and the conveyance system in those areas, a list of all the components of the conveyance system, and a description of which components are in the community's inspection and maintenance program. The map and inventory for CDR credit should be prepared in five steps. A sixth step is provided for problem site maintenance credit (PSM) and a similar process is followed for storage basin maintenance (SBM).

Step 1. Identify the developed area of the community. Select a map of the community and identify the developed areas. Undeveloped or sparsely developed areas (e.g., those with minimum lot sizes of five acres or more), or areas in which no buildings would be affected by a lack of maintenance (e.g., steep ravines), may be excluded. However, undeveloped or sparsely developed areas with insurable buildings or critical facilities that could be affected by a lack of maintenance must be included.

Step 2. Map the conveyance system. Within the developed area of the community identified in Step 1, delineate the conveyance system on the map. The conveyance system includes rivers, creeks, natural streams, open channels, and ditches that need to be maintained to prevent flooding of buildings. Note:

- (a) Both public and private areas must be included in the delineation, regardless of the community's authority to inspect those areas.
- (b) The delineation must include all channels in developed Special Flood Hazard Areas (SFHAs) shown on the community's Flood Insurance Rate Map (FIRM).
- (c) All surface channels shown as blue lines on a U.S. Geological Survey quadrangle and drainage facilities with more than 40 contributing acres must be shown.
- (d) Although credit is provided only for maintenance of the surface conveyance system, the entire system that drains 40 acres or more must be shown on the map. If the system that drains 40 acres or more includes reaches that flow underground, then the underground segments must also be shown on the map.

Step 3. Identify and label the components of the conveyance system. On the map, identify and label the surface conveyance components of the drainage maintenance area. "Components" are structures and channel segments, including

- (a) Each culvert, bridge, drop structure, and other structures where maintenance may be an issue, and
- (b) Each channel segment between two structures. If a segment is more than one-fifth ($1/5$) of a mile long, it should be divided into enough segments that no segment is longer than one-fifth of a mile.

Underground segments of the surface conveyance system need to be shown on the conveyance system map but should not be counted as components. However, the inlet from a channel to an underground segment is considered a component of the surface conveyance system.

Component labels may be as simple as numbers or numbers with prefixes to identify the stream or channel name. Communities may choose to label the components with an identifier for a channel segment ("CH001") or a bridge crossing ("BR001").

Step 4. Inventory the components. Develop an inventory or list of all components of the surface conveyance system. Each structure and channel segment should be listed with the identifier used in the conveyance system map. Figure 540-1 shows a sample inventory table, used for determining the community's impact adjustment for this activity.

All surface conveyance system components within the community's developed area must be listed in the inventory. Again, although underground segments of the surface

Components of a Conveyance System

Structures

- Culverts
- Bridges
- Drop structures
- Other structures where maintenance may be an issue

Segments

- Channel segment between two structures
- Channel segment less than $1/5$ mile long

conveyance system need to be shown on the conveyance system map, they should not be counted as components or included in the inventory.

Component	Type	Description	Owned By		
CH0001	Channel	Between 1st Street and Central	City		
CU0001	Culvert	Jones Creek at Central	City		
CH0002	Channel	Between Central and Main	City		
BR0001	Bridge	Jones Creek at Main	County		
CH0003	Channel	Between Main and Grand Avenue	Private		
CU0002	Culvert	Jones Creek at Grand Avenue	City		

Figure 540-1. Step 4 of a sample inventory of a conveyance system.

Step 5. Show the components of the conveyance system that are included in the community’s inspection and maintenance program. The surface conveyance components included in the community’s inspection and maintenance program must be highlighted on the conveyance system map or marked in some other method, and they must be noted on the component inventory or list (Figure 540-2).

The community may also note the components that are not part of their program for various reasons. For example, there may be no right of access on private property or there may be areas that the community does not cover for budgetary or other reasons.

Component (cCDC)	Type	Description	Owned By	Credited (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	Yes
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	Yes
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

Figure 540-2. Step 5 of a sample inventory of a conveyance system.

Step 6. Show the problem site maintenance locations on the map and list locations in the inventory. If the community is requesting credit for problem site maintenance (PSM) (see Section 542.b), the list should identify components that are problem sites, as shown in Figure 540-2.

Conveyance System Inspection and Maintenance Procedures

The community must provide procedures, instructions, or other documents that explain the community's inspection and maintenance program. The document(s) need not exceed several pages. In some cases, the description will be in various documents, such as a job description, field procedures manual, memorandum of agreement with another agency, contract for canal mowing, drainage system map, or forms used for records.

The following must be included in the document(s):

- (1) Designation of the person, entity, or position responsible for the program. This may be an agency other than the community's public works department, such as a drainage district (responsible for larger canals), the state highway department (responsible for highway bridges and culverts), or even a private property owner. The community is still responsible for providing the materials needed to verify the program.
- (2) The conveyance system map showing all facilities in the developed part of the community and identifying which facilities are covered by the channel debris removal program.
- (3) The list of the components of the conveyance system, including whether each component is natural or constructed.
- (4) An explanation of the procedures for inspection, including when regular inspections are conducted, how soon inspections are conducted after a complaint or a storm, and whether the procedures are different for manmade and natural channels.
- (5) The debris removal procedures, i.e., how soon after an inspection an area must be cleared, and what can and cannot be removed. These procedures may be different for different streams. For example, they may call for the public works department to remove downed trees and underbrush from manmade ditches but to leave them in parks or natural areas. Simply stating that "problems are corrected" or "debris is removed" is not an adequate description of what actions are to be taken for the different types of materials that may be found.
- (6) The records that are kept to document both the inspections and the removal projects.

Even if an entity other than the community performs the inspection and/or debris removal, it is the community's responsibility to document the activity for credit. In the case of a drainage district or county-wide maintenance program, the community may find it advantageous to work with other affected communities and with the larger agency to develop consistent documentation that can be used by all communities.

Examples of such procedures are presented in *CRS Credit for Drainage System Maintenance* (see Appendix C).

Credit Points

CDR = 200 points, for channel debris removal within the community's conveyance system in accordance with the credit criteria

The action taken must be in accord with the community's inspection and maintenance procedures, which must be consistent with federal and state environmental protection laws and regulations.

Impact Adjustment

$$rCDR = \frac{nCDR}{nCDC}, \text{ where}$$

nCDR = the number of conveyance system components inspected and maintained, and

nCDC = the total number of conveyance system components in the developed portion of the community's drainage system

If rCDR is less than 0.10, then 0.10 is used.

If the community's program does not inspect and maintain the conveyance system components in all developed areas, then the impact adjustment measurements (nCDR) must exclude those components that are not inspected or maintained. The most common reason for not maintaining components in a developed area is that the streams or facilities lie on private property.

Note that the CRS is not intended to encourage communities to look at flood protection in isolation from other equally important local concerns, such as habitat preservation. However, if a facility is not maintained for any reason and damage to buildings could result, the lack of drainage system maintenance must be reflected in the impact adjustment.

Example 542.a-2.

A public works department for a community in Georgia inspects all of the publicly owned channels, bridges, and culverts within the city, but not the private facilities. City crews remove critical accumulations of debris that are found during the annual inspection and when problems are reported by neighboring residents. This work is done every winter. From the community's conveyance system map and inventory, the community has determined there are a total of 125 conveyance system

components within the city, and 80 of those components are inspected and maintained by the community.

$$rCDR = \frac{nCDR}{nCDC} = \frac{80}{125} = 0.64$$

Documentation Provided by the Community

(1) At each verification visit,

- (a) A copy of the procedures, instructions, or other documents that explain the community's routine inspection and debris removal program.
- (b) The map of the community's drainage maintenance area with the conveyance system delineated and its components (structures and segments) labeled.
- (c) A complete inventory of the components of the community's conveyance system.
- (d) Copies of the records that show that inspections were conducted and maintenance was performed when inspections revealed problems.
- (e) Completed Certifications of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance (CC-540EHP) from the community and other local, regional, or state agencies, which can be found in Appendix F.

The ISO/CRS Specialist will visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records that show that inspections were conducted during the year and maintenance was performed when the inspections revealed problems.

542.b. Problem site maintenance (PSM)

The maximum credit for this element is 50 points.

PSM credit is provided if the community's conveyance system maintenance program identifies components that are "choke points," chronic dumping sites, obstructions to flows, or sites with erosion or sedimentation problems, that are inspected and maintained differently or more frequently than other parts of the system. Such inspections are in addition to those credited under CDR.

Credit Criteria

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must also be receiving credit for CDR.
- (3) The community must have written procedures or guidelines that identify each problem site component, what the issues are, and what special inspection and/or maintenance is needed. These are explained in “Maintenance Procedures for Problem Sites,” below.
- (4) The problem sites are identified on the community conveyance system map developed for CDR credit and noted in the conveyance system component inventory.
- (5) The community’s maintenance program must require that
 - (a) An inspection be conducted more than once each year,
 - (b) An inspection of each problem site component be conducted after each major storm, and
 - (c) Action be taken after an inspection identifies a need for maintenance or cleaning.

Maintenance Procedures for Problem Sites

The written procedures or guidelines for problem site maintenance may be a part of the community’s CDR procedures. It needs the following additional information:

- (1) A list of each problem site, including
 - What makes the site different from the rest of the drainage system,
 - The procedure for increased inspection and maintenance, and
 - Who is responsible for the inspection and maintenance of the site.
- (2) The records that are kept to document both the inspections and the maintenance, if different from the CDR records.

Credit Points

PSM = 50, if the community’s program for problem site maintenance is in accord with the credit criteria

Example 542.b-1.

Over the years the City of Pullman’s crews have identified spots that are chronic drainage problems, such as the culvert under the railroad on the South Fork Palouse River and places on Missouri Flat Creek where ice jams usually form in late winter. The drainage maintenance procedures list these spots and require the crews to visit them first and

more frequently during rains or ice breakup. The culvert under the railroad is inspected weekly and cleaned out as soon as debris is found. PSM = 50

Impact Adjustment

$$rPSM = rCDR$$

Documentation Provided by the Community

(1) At each verification visit,

- (a) A copy of the procedures, instructions, or other documents that explain the community's problem site inspection and maintenance. These are likely to be part of the procedures submitted for CDR credit. The special problem site inspection and maintenance procedures need to be identified, e.g., marked in the margin as "PSM."
- (b) The inventory of the components of the community's conveyance system prepared for CDR, annotated to show which components are problem sites.
- (c) Copies of the records showing that inspections were conducted and that maintenance was performed when inspections revealed problems.

The ISO/CRS Specialist will visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records showing that inspections were conducted during the year and that maintenance was performed when inspections revealed problems.

542.c. Capital improvement program (CIP)

The maximum credit for this element is 70 points.

CIP credit recognizes the implementation of a capital improvement plan and a capital improvement program that make permanent, structural changes within the drainage system to reduce flood problems or maintenance problems. This credit is not for a program of continuous maintenance, such as cleaning inlets and culverts. Creditable examples would be ongoing programs to

- Enlarge culvert and bridge openings to eliminate bottlenecks,
- Install permanent hard or soft bank protection measures,
- Install grates to catch debris during high flows,

- Build new retention basins to reduce flows into existing channels, or
- Convert problem channels into “low-maintenance” channels.

The capital improvements program should address the “choke points and other obstructions to flows” that warrant the special attention that is credited in PSM.

Credit Criteria

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must also be receiving credit for CDR.
- (3) Sites that are improved through the program must be in the community’s conveyance system as defined in its procedures to document CDR. Projects to improve road drainage or storm drains can only be credited if those sites are identified in the community’s procedures and regularly inspected and maintained.
- (4) There must be a “master list” of problem sites that are planned for improvement projects. The list can be prepared from master watershed plans, complaints, or reports from maintenance crews. Projects do not have to be prioritized or listed in any order. For example, the community may determine which projects will be funded at the beginning of each fiscal year.

The master list could be of problem sites submitted in relation to PSM credit, provided that the community intends to “eliminate or correct the problem sites.” In other words, the list must be related to the capital improvement program. It cannot just be a list of problems that are not slated for correction.

The recommended correction measures for the problem sites do not need to be the result of detailed plans or studies. They may be one-sentence statements on the most likely approach (e.g., “enlarge culvert,” “bank stabilization,” etc.).

If the program is administered by a county or multi-community district (i.e., an organization outside the community’s jurisdiction), then the list must be prepared from master watershed plans and not based solely on complaints or other ad hoc methods.

- (5) For full credit, an engineering analysis must have been completed that identifies the problem and provides a solution. It must include an estimate of the 1% annual chance (100-year) flood at the problem site and the resulting flood elevations. The design of the “solution” may use a lower design standard, but the community needs to recognize the impact of the 1% flood.
- (6) The community must spend money on a regular basis on such improvement projects (a one-time-only project would not be credited). This can be documented by a multi-year capital improvements budget or line items in several years’ budgets that fund drainage improvement projects.

CIP and Credit for Activity 530

Once a capital improvement project is completed, it may qualify for CRS credit under Activity 530 (Flood Protection). Projects that protect repetitive loss properties and critical facilities receive higher credit under Activity 530.

All the needed documentation can usually be found in three documents: an engineering report identifying problems and likely projects, a written capital improvement plan for public works or a drainage plan that has a master list of proposed projects, and the community's annual budget that shows how funds are spent each year.

The analyses done for WMP credit under Activity 450 (Stormwater Management) may include a list of projects that may qualify for CIP credit.

Credit Points

CIP = 30, if the community has an ongoing program, such as a capital improvement plan, that meets the credit criteria

CIP = 70, if the community has an acceptable engineering analysis of the drainage system that meets the credit criteria

Example 542.c-1.

King County, Washington, has a county-wide Flood Control Zone District that is funded by property taxes. It funds a variety of programs, including a six-year Capital Improvement Program, which is updated annually. The Capital Improvement Program was developed through an engineering analysis of each watershed within the community. Currently over 50 projects are completed each year. CIP = 70

Impact Adjustment

$rCIP = rCDR$

Documentation Provided by the Community

(1) At each verification visit,

- (a) Excerpts from the capital improvement plan or other documentation that shows that the community (or other drainage maintenance agency) has an ongoing program to reduce drainage maintenance problems. The submittal must include
 - (i) A master list of the community's drainage maintenance problem sites that are in need of elimination or correction;
 - (ii) Recommended correction measures for the problem sites;
 - (iii) Documentation that funds are spent on capital improvement projects each year, and
 - (iv) [If full credit is requested] Documentation of the engineering analysis.

542.d. Stream dumping regulations (SDR)

The maximum credit for this element is 30 points.

SDR credit is provided for adopting and enforcing regulations that prohibit the dumping or disposal of debris throughout the community's drainage system. Many local urban flood problems are caused when shopping carts, yard waste, or other debris is dumped into channels. This debris can clog culverts, divert flows, and reduce the conveyance capacity of channels. Regulations that prohibit the disposal of all debris within a channel help reduce this problem.

Credit is not provided for an ordinance that prohibits littering or similar general nuisances, for ordinance language directed solely at water quality problems, or for language limited to activities in the floodplain. The regulations must specifically address the problem of keeping channels clear of materials such as brush, fill, and items normally not covered in littering ordinances.



Credit Criteria

- (1) The activity credit criteria in Section 541.b. must be met.
- (2) The community must also be receiving credit for CDR.
- (3) The regulations that prohibit disposal of debris in the community's drainage system must be enforced throughout the entire community. The ordinance or law must designate an office or official responsible for receiving complaints and monitoring compliance and it also must include enforcement and abatement provisions.
- (4) Additional credit is provided if the community publicizes the regulatory requirements that prohibit stream dumping. This may be done through the following outreach projects:
 - (a) A notice sent to all property owners in the community (which may or may not be credited under OP in Activity 330 (Outreach Projects)); or
 - (b) Posting “no dumping in the stream” signs at key locations in the drainage system, such as frequent problem spots, schools, or public parks. An example of a sign that has been used by several CRS communities is shown in Figure 540-3; or
 - (c) An outreach project identified in the community's Program for Public Information (PPI) credited under Activity 330 (Outreach Projects), provided the PPI discusses publicizing drainage system maintenance and the regulations that prohibit dumping.

Credit Points

SDR = EITHER:

SDR = 15, if regulations prohibit dumping in the community's drainage system,

OR

SDR = 25, if regulations prohibit dumping in the community's drainage system and the community publicizes the regulatory requirements (see credit criterion (4)(a) or (b)),

OR

SDR = up to 30, if regulations prohibit dumping in the community's drainage system and the publicity is covered in the community's PPI (see credit criterion (4)(c))

Example 542.d-1.

A community's code of ordinances deals with nuisances and misdemeanors. The article states that the police department is responsible for enforcement of listed violations. It also prescribes penalties.

The code states:

It shall be unlawful to dump, deposit, or otherwise cause any trash, landscape debris, or other material to be placed in any stream, channel, ditch, pond, or basin that regularly or periodically carries or stores water.

The community's documentation includes all appropriate sections of the municipal code with "SDR" marked in the margins. One of the City's outreach projects in Activity 330 discusses the need for drainage system maintenance and what to do if dumping is seen. SDR = 25

Impact Adjustment

There is no impact adjustment for this element. The regulation must be enforced throughout the entire community.

Documentation Provided by the Community

(1) At each verification visit,

- (a) A copy of the stream dumping ordinance or law prohibiting the disposal of debris in the affected drainage system. The acronym SDR must be marked in the margin of the ordinance sections that pertain to this element, including the responsible office or official.
- (b) [If the community is requesting the extra credit for publicizing the regulation] A copy of how the community publicized the regulations during the year. If the publicity was in a document credited under Activity 330 (Outreach Projects), a separate submittal is not needed, provided that the other document (including a PPI, if credited) is annotated to show where SDR is publicized.

(2) At each recertification,

- (a) [If the community is requesting the extra credit for publicizing the regulations] A copy of how the community publicized the regulations during the year.

542.e. Storage basin maintenance (SBM)

The maximum credit for this element is 120 points.

SBM credit is dependent upon annual inspections and regular maintenance of retention, detention, infiltration, and other types of storage basins. The community (or other non-federal agency) must have a program to regularly inspect public and private storage basins and remove debris as needed. Neither the cost of the work nor the amount of debris removed affects the credit. A program that responds to complaints and conducts inspections after storms is required, but such a program alone is not enough to obtain this credit.

After each inspection, appropriate maintenance must be completed where it has been determined that it is needed.

The maintenance work is normally done by a public works crew, usually without specialized equipment, but backhoes and trucks are frequently required. The objective of this activity is to remove accumulated sediment or debris that prevents the storage or infiltration of excess stormwater. It is important that the community's procedures spell out what can and cannot be removed. In some areas detention facilities also provide water quality treatment. In those situations, special care must be taken when removing sediment and debris to ensure that the facility still provides all its design functions.

Inspection and maintenance may also be performed by the owner of the basin. The community's ordinance (credited under PUB in Activity 450) must require inspections by a registered design professional at least annually, with the reports submitted to the community.

Credit Criteria

(1) The activity credit criteria in Section 541.b. must be met.

- (2) The community must also be receiving credit for both SZ and PUB within element SMR under Activity 450.
- (3) The community must have a program to inspect and maintain its storage basins, and inspections must be conducted
 - (a) At least once each year,
 - (b) Upon receiving a complaint, and
 - (c) After each storm that could adversely affect the drainage system.

Action must be taken when an inspection reveals a need for maintenance or cleaning. Procedures for inspection and maintenance must be in the form of written procedures or guidelines. These are explained in “SBM Procedures,” below
- (4) The location of all public and private storage basins must be mapped.
- (5) The community must have a complete inventory of storage basins within its jurisdiction.
- (6) All the maintenance and inspection activities must be recorded and the records must be maintained until the next verification visit.

SBM Procedures

The written SBM procedures or guidelines, which may be a part of the community’s CDR procedures, must include the following additional information:

- (1) An inventory of all storage basins in the community designating
 - (a) The type of facility (detention, infiltration, retention, below-ground),
 - (b) Whether it is publicly or privately owned,
 - (c) Whether it is a natural component or constructed component, and
 - (d) Whether it is subject to the maintenance program;
- (2) An explanation of the procedures for inspection, including when regular inspections are conducted and how soon inspections are conducted after a complaint or a storm;
- (3) The maintenance procedures, i.e., how soon after an inspection an area must be cleared, and what can and cannot be removed; and
- (4) The records that are kept to document both the inspections and the removal projects.

Examples of such procedures are presented in *CRS Credit for Drainage System Maintenance* (see Appendix C).

Credit Points

SBM = 120 points for maintenance of storage basins within the
community in accordance with the credit criteria

Impact Adjustment

The impact adjustment for SBM is based on all storage basins in the community, rather than only those that are in development approved since the community started receiving CRS credit. The community's SBM procedures must include a list of all public and private storage or retention basins and note those that are covered by the procedures (nSBM).

$$rSBM = \frac{nSBM}{nSBC}, \text{ where}$$

nSBM = number of storage basins, public and private, inspected and maintained by the community, and

nSBC = total number of storage basins, public and private, within the community

If rSBM is less than 0.10, then 0.10 is used.

Example 542.d-1.

A city's public works department inspects all of the city's public storage basins and requires the owners of private storage basins to submit an annual inspection report to the city. City crews remove critical accumulations of debris that are found during the annual inspection and when problems are reported by neighboring residents. In addition, the city frequently performs maintenance on private facilities and then bills the owner for the work when the owners do not perform the required annual inspection or maintenance.

The program inspects and maintains 10 publicly owned basins and 54 of the 102 private basins. The 54 basins were constructed after passage of an ordinance that requires public maintenance.

$$nSBM = 10 + 54 = 64$$

$$nSBC = 10 + 102 = 112$$

$$rSBM = \frac{nSBM}{nSBC} = \frac{64}{112} = 0.57$$

Documentation Provided by the Community

(1) At each verification visit,

- (a) A copy of the procedures, instructions, or other documents that explain the community's storage basin inspection and maintenance program.
- (b) The map showing the location of all storage basins in the community.

- (c) The inventory of the storage basins located in the community.
- (d) Copies of the records that show that inspections were conducted and maintenance was performed when the inspections revealed problems.
- (e) A completed Certification of Compliance with Environmental and Historic Preservation Requirements for Drainage System Maintenance (CC-540EHP), which can be found in Appendix F.

The ISO/CRS Specialist will visit a sample of sites in the field to verify that maintenance has been performed in accordance with the procedures.

(2) With the annual recertification,

- (a) Examples of the records that show that inspections were conducted during the year and maintenance was performed when the inspections revealed problems.

542.f. Coastal erosion protection maintenance (EPM)

Credit for maintaining erosion protection programs in communities with coastal erosion-prone areas is described in *CRS Credit for Management of Coastal Erosion Hazards*. The credit points, cEPM, are added to the other elements in Activity 540.

The CRS encourages communities to devote special attention to areas affected by coastal erosion. A maximum of 100 points is available for maintaining measures that protect buildings from coastal flooding or erosion. These include the preservation of dunes or mangroves, stabilization of bluffs, and beach nourishment. There are several prerequisites to this credit, including a requirement for coastal erosion setback regulations, which are described in *CRS Credit for Management of Coastal Erosion Hazards* (see Appendix C or www.CRSresources.org).

Documentation Provided by the Community

Documentation is described in *CRS Credit for Management of Coastal Erosion Hazards*.

543 Credit Calculation

$$c540 = ((CDR + PSM + CIP) \times rCDR) + SDR + cSBM + EPM,$$

where

$$cSBM = SBM \times rSBM$$

544 For More Information

- a. Additional information, reference materials, and examples can be found at www.CRSresources.org/500.
- b. The following documents can be downloaded from www.CRSresources.org or ordered free (see Appendix C).

CRS Credit for Drainage System Maintenance

CRS Credit for Management of Coastal Erosion Hazards.

- c. Rural communities can request help on this activity from the Natural Resources Conservation Service. Requests should be submitted to the local soil and water conservation district, which is usually located in the county seat.
- d. *Stream Obstruction Removal Guidelines*, C. McConnell et al., eds., American Fisheries Society, 1983. Copies are available for \$8 plus shipping from the American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814 or from the online bookstore at <http://afsbooks.org/x55010xm>.

545 Related Activities under the Community Rating System

- The publicity needed for stream dumping regulations credit (SDR) can be an outreach project credited under Activity 330 (Outreach Projects). More credit can be received if the outreach project was part of a Program for Public Information, which is also credited under Activity 330.
- Element OSP (open space preservation) under Activity 420 (Open Space Preservation) reduces the need for channel maintenance.
- Activity 420's natural shoreline protection element (NSP) encourages communities to let their shorelines and stream banks go natural, reducing the need for maintenance in these areas. However, if the natural shorelines are in developed areas, they would still need to be inspected for debris to receive full credit for CDR. The impact adjustment map for NSP should be the same as the conveyance system map needed for CDR.
- Stormwater management regulations (SMR) in Activity 450 (Stormwater Management) establish the criteria and design standards for storage basins within a community.
- Public maintenance of required facilities (PUB) in Activity 450 (Stormwater Management) provides the authority for public inspection and maintenance of private drainage facilities.
- Once a capital improvements project (CIP) is completed, it may qualify for CRS credit under Activity 530 (Flood Protection). Projects that protect repetitive loss properties and critical facilities receive higher credit under Activity 530.