

Unit II

Floodplain Management Basics



Unit II Objectives



- Define key terms and concepts used in floodplain management
- Discuss the value of protecting floodplains



II-2

Unit II Objectives (cont.)



- List key events and legislation in floodplain management
- Differentiate between Federal, State, and local roles in floodplain management



II-3

Key Terms and Concepts



II-4

Floodplain

Any land area susceptible to being inundated by flood waters from any source



- A lowland and a relatively flat area adjoining inland and coastal waters
- The 100-year or base floodplain



II-5

Types of Floodplains

- Riverine
- Coastal
- Special floodplain areas



II-6

Riverine Floodplains

Valley areas adjacent to any size stream or river that can be covered by floodwaters



Riverine Flooding:
Flooding along a channel



II-7

Coastal Floodplains

- Border lakes, estuaries, gulfs, or oceans
- Flooding due to landward flows caused by unusually high tides, waves from high winds, storm surges, tsunamis, or combination



Photo Source: J Sparenberg

II-8

Coastal Floodplains: Storm Surge

- Consists of water pushed toward the shore by the storm winds and water pulled in by lower atmospheric pressure
- Most coastal floods are caused by coastal storms



II-9

Special Floodplain Areas

- Sheet flow or shallow flooding areas
- Wetlands
- Sinkholes



II-10

Watershed

- A specific area of land that drains water, sediment, and dissolved materials to a common water body such as a river, lake or ocean
- Flooding in an elevated area of the watershed can drain and flood lower lying areas



II-11

Floodplain: Engineering Analysis

Hydrologic Analysis:

- Amount of precipitation likely to fall on watershed
- Amount of precipitation that will be absorbed by the soil and vegetation or trapped in depressions
- Peak water flows (cubic feet per second)

Hydraulic Analysis:

- Watershed capacity
- How water will flow through the watershed
- Structure
- Interaction



II-12

National Flood Insurance Program

- Enables property owners in participating communities to purchase insurance as protection against flood losses



- In exchange, States and communities must have floodplain management regulations that reduce future flood damages



II-13

Base Floodplain



- Area that has **at least** a 1% chance of being flooded in any year
- Also referred to as the "100-year floodplain"



II-14

Base Flood Elevation (BFE)

- Water surface elevation corresponding to a flood that has a 1% probability of being equaled or exceeded in any given year
- 44 CFR Part 9 and EO 11988: the minimum standard for protecting facilities and structures



II-15

Base Flood Elevation (cont.)

- Used to determine if property owners are required to obtain flood insurance as a condition of obtaining a federally backed mortgage loan or other financial assistance



II-16

Floodway

- Channel of a river or watercourse and the adjacent areas that must be unconfined or unobstructed
- Provides for the discharge of the base flood
- Floodwaters generally are deepest and swiftest in the regulatory floodway



II-17

Flood Fringe

Flood Fringe is:

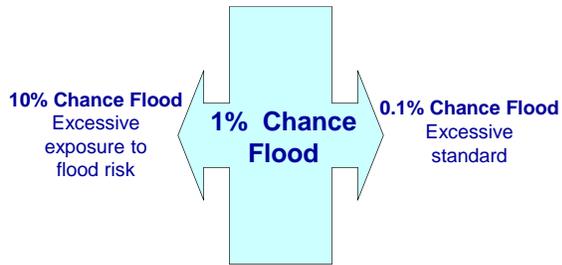
- The portion of the floodplain outside of the floodway
- Usually contains slow-moving or standing water
- Often referred to as "floodway fringe"

Development in the flood fringe typically does not interfere with the flow of water, so floodplain regulations for these areas often allow development to occur. However, elevation and floodproofing is required.



II-18

Why the 1% Chance Flood?



II-19

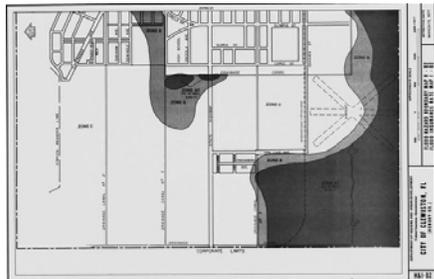
Special Flood Hazard Area (SFHA)

- Area where NFIP floodplain management regulations must be enforced
- Also known as Base Floodplain



II-20

Flood Hazard Boundary Map (FHBM)



II-21

Flood Boundary and Floodway Map (FBFM)



II-22

Flood Insurance Rate Map (FIRM)

- Flood maps developed by engineers, based on hydrologic and hydraulic analyses
- Show locations of the SFHAs



II-23

Flood Zones in SFHAs

A Zone	Any area within the SFHA without an established BFE
AE Zone	BFE has been determined through an engineering analysis called a Flood Insurance Study (FIS)
AO Zone	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Some Zone AO have been designated in areas with high flood velocities such as alluvial fans and washes.
AH Zone	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet.



II-24

Flood Zones in SFHAs (cont.)

V Zone	Coastal area where there is a velocity hazard due to wave action
VE Zone	Coastal area with velocity hazard due to wave action and for which BFE has been determined



II-25

Terms

- **Coastal High Hazard Area:** The areas subject to high velocity waters including but not limited to hurricane wave wash or tsunamis. On a Flood Insurance Study (FIS) this area appears as a V or VE Zone.
- **Critical Action:** For which even a slight chance of flooding is too great. The minimum floodplain of concern is the 500-year floodplain. Critical actions include, but are not limited to those which create or extend the useful life of structures or facilities.
- **Five Hundred Year Floodplain:** The base floodplain, which is subject to inundation from a flood having a 0.2 percent chance of being equaled or exceeded in any given year.



II-26

New Construction

- Construction of a new structure or facility
 - Placement of a mobile home
 - Replacement of a structure that has been “totally destroyed”
-  Is there a difference between replacement and reconstruction?
-  What is “totally destroyed?”



II-27

Functionally Dependent Use

- Use which cannot perform its intended purpose unless it is located or carried out in close proximity to water



What are examples of functionally dependent use?



II-28

Substantial Improvements

- Any repair, reconstruction or other improvement of a structure, that has been damaged in excess of 50% of the market value of the structure before the damage occurred
- Any repair, reconstruction, or other improvement of a structure or facility, which has been damaged in excess of 50% of the replacement cost of the facility before the damage occurred
- Any repair, reconstruction or other improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the repair or improvement started
- Any repair, reconstruction or other improvement of a structure or facility the cost of which equals or exceeds 50% of the replacement cost of the facility before the repair or improvement is started



II-29

Discussion Question



How do you determine if repairing a small portion of a road, utility line, or levee is substantial improvement?



II-30

Advisory Base Flood Elevation (ABFE)

- May be issued by FEMA when a major flood disaster indicates the current FIS and FIRMs need updating
- Based on post-flood surveys of flood elevations in the community



II-31

Advisory Base Flood Elevation (cont.)



- Provided to communities as advisory information
- May be the best available data in a community
- Adoption of ABFE by communities is voluntary



II-32

Check on Learning



Review of Floodplain Management Terms



II-33

Natural and Beneficial Values of Floodplains

- These are the qualities of floodplains or the functions served by floodplains
- Also referred to as natural resources, natural functions, or special qualities of the floodplain



II-34

Floodplain Functions

- Water Resource
- Living Resources
- Cultural Resources



II-35

Water Resources

- Reduce flood frequency and severity
- Contain stormwater runoff
- Minimize non-point water pollution
- Provide natural erosion control
- Recharge groundwater



II-36

Living Resources



- Enhance biological diversity
- Provide a habitat for fish and wildlife
- Help to create and enhance waterfowl habitats
- Food and nutrient sources



II-37

Cultural Resources



- Recreational benefits through outdoor recreation
- Scientific benefits through knowledge gained in studying
- Open space
- Education
- Historic and archaeological



II-38

Cultivated Resources



- Agriculture
- Aquaculture
- Forestry
- Recreational fisheries
- Shell fisheries



II-39

Floodplain Management

Floodplain management is a program of corrective and preventive measures for reducing flood damage



Source: Iowa Dept. of Natural Resources



II-40

Discussion Questions



What are some examples of measures that protect property from flood damage by modifying the flow of water?



What measures limit flood damages to existing structures or infrastructure without restricting the flow of floodwaters?



What measures limit or prevent flood damages to new structures?



I-41

Higher Standards

Communities may adopt requirements that go beyond the minimum NFIP requirements

Examples:

- Requirement that buildings be protected or elevated to a level higher than the BFE
- Prohibition of fill in the floodplain or requirement for compensatory storage space for floodwaters



II-42

Video: Protecting Structures in a Floodplain



11-43

Unit III

Wetlands Protection Basics



Unit III Objectives



- Define key wetlands terms and concepts
- Explain wetland values to the environment
- List key events and legislation in evolution of wetland protection
- Describe the role of the Federal, State, and local governments in wetland protection



III-2

Discussion Question



What is a wetland?



III-3

Definition of Wetlands

Areas that are inundated or saturated at a frequency and duration sufficient to support, --and under "normal circumstances" do support,--vegetation adapted for life in saturated soil conditions



III-4

Characteristics of Wetlands

Characteristics of wetlands vary, but share ecological similarities:

- Store water
- Transform nutrients and pollutants
- Support biological diversity



III-5

Marshes

- Predominantly contain plants that do not have strong woody stems and branches
- May be freshwater, saltwater, or brackish



Source: www.refugenet.org



III-6

Swamps

- Dominant vegetation is woody plants (trees, shrubs)
- Freshwater swamp may be a forested swamp or shrub swamp
- Saltwater swamps are called mangrove swamps



III-7

Bogs

- Freshwater wetlands found in cold regions
- Bottom layer consists of peat or organic muck
- Middle layer consists of peat
- Surface is often covered by a mat of vegetation called sphagnum



III-8

Slough

- Ground depression or hollow usually filled with deep mud or mire
- Often is a stagnant swamp, marsh, bog, or pond that is usually part of a bayou



III-9

Pothole

- A shallow, water-holding depression of glacial origin
- Sizes range from less than one-quarter to several thousand acres
- May be caused by wind erosion



III-10

Check on Learning: Wetlands

1. Woody plants like trees and shrubs are found in _____.
2. _____ are deep and filled with deep mud or mire.
3. The bottom layer of a _____ consists of peat.
4. _____ are filled with herbaceous plants, not woody plants.
5. Glaciers or winds formed these shallow, water-holding depressions called _____.



III-11

Wetlands Classification System

- Developed by the U.S. Fish and Wildlife Service in 1979
- Referenced in 44 CFR Part 9
- Used by FEMA in wetland determination
- Consists of five systems



III-12

Marine Wetlands

- Coastline exposed to waves and currents of the open ocean
- Salinity exceeds 30 parts per thousand (ppt)



III-13

Estuarine Wetlands



- Deepwater tidal habitats and adjacent tidal wetlands
- Partially enclosed by land with some access to ocean
- Include tidal swamps, tidal salt marshes, and mangrove swamps
- Salinity exceeds 0.5 ppt



III-14

Riverine Wetlands

- Associated with a floodplain or riparian corridor
- Influenced by riverine flooding
- Salinity is less than 0.5 ppt



III-15

Lacustrine Wetlands

- Situated in a topographic depression or dammed river channel
- Lack trees, shrubs, mosses, or lichens – plants tend to be floating or submerged
- Salinity is less than 0.5 ppt



III-16

Palustrine Wetlands

- Dominated by trees, shrubs, persistent emergents, emergent (vs. submergent or floating) mosses or lichens
- Include marshes, swamps, and bogs
- Salinity is less than 0.5 ppt



III-17

Check on Learning: Wetland Systems

1. Lakes or dammed river channels with floating or submerged plants are _____ wetlands.
2. A wetland system exposed to waves and currents of open ocean is _____.
3. Trees, shrubs, mosses and lichens are associated with _____ wetlands.
4. _____ wetlands are associated with a floodplain or a lush, thick, streamside vegetation.
5. Tidal swamps, tidal salt marshes, and mangrove swamps are _____ wetlands.



III-18

USACE Wetlands Delineation Manual

In 1987 the U.S. Army Corps of Engineers developed a manual that:

- Identifies and delineates wetlands potentially subject to Clean Water Act Section 404 permit requirements
- Requires a positive wetland indicator for all three parameters: vegetation, soils, and hydrology
 - **NOTE:** FWS only requires a positive wetland indicator for any one of the three parameters
- Has Regional variations



III-19

Unit IV

Executive Orders 11988 & 11990: Floodplain Management and Wetlands Protection



Unit IV Objectives (cont.)

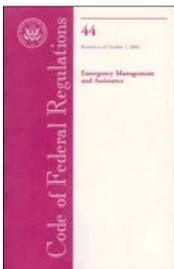


- Refer to 44 CFR Part 9 sections for implementing EOs
- Differentiate between Actions and Critical Actions
- List the eight steps of the decision-making process for EOs



IV.2

44 CFR Part 9



- Provides leadership in floodplain management and wetland protection
- Integrates the EOs' goals into FEMA's procedures for implementing NEPA
- Applies to all FEMA actions



IV.3

Actions vs. Critical Actions



IV-4

Actions

Defined in 44 CFR 9.4 as any action or activity:

Acquiring, managing, and disposing of Federal lands and facilities

Providing federally undertaken, financed, or assisted construction and improvements

Conducting Federal activities and programs affecting land use



IV-5

Critical Actions

Defined in 44 CFR 9.4 as any action or activity:

For which even a slight chance of flooding is too great

That creates or extends the useful life of structures or facilities (critical facilities)



What are some examples of critical facilities?



IV-6

Critical Actions (cont.)

Critical Action Floodplain

At a minimum, critical actions must be protected to the 500-year floodplain or at least 0.2 % chance floodplain



What is the 500-year floodplain?



IV-7

Strategies for Implementing Executive Orders

- Use a systematic decision-making process
- Document each step of the process
- Involve the public in the decision-making process



IV-8

8-Step Decision-Making Process

Step 1	Determine Proposed Action Location
Step 2	Early Public Notice
Step 3	Identify Alternative Actions
Step 4	Identify Impacts
Step 5	Minimize Adverse Impacts
Step 6	Reevaluate Alternatives
Step 7	Final Public Notice
Step 8	Implement Action



IV-9

Applicant's Responsibilities

- Applicants must recognize and reflect the following in their application:
 - FEMA's policy on floodplain management and wetlands protection
 - The decision-making process used by the agency
 - Mitigation and public involvement
- Applicants may be called upon to provide supporting information relative to the various responsibilities listed above



IV-10

8-Step Decision-Making Process



IV-11

Step 1: Determine Proposed Action Location

- Is the action in a wetland or in the 100-year (or 500-year) floodplain?
- Does the action have the potential to affect a floodplain or wetland?
- Will the action be affected by the floodplain or wetland?



IV-12

Step 2: Early Public Notice



Keep the public informed and involved early and often



IV-13

Step 3: Identify Alternative Actions

- Avoid the floodplain or wetland unless it is the only practicable alternative
- Consider alternative sites, alternative actions, or no action



IV-14

Step 4: Identify Impacts

Direct Impacts	Caused by the action and occur at the same time and place as the action <i>What are the potential effects on lives, property, and natural floodplain functions?</i>
Indirect Impacts	Caused by the action but occur later in time or at some distance from the action <i>Does it encourage, allow, serve, or otherwise facilitate additional floodplain development?</i>



IV-15

Step 5: Minimize Adverse Impacts

- Minimize harm to and within the floodplain or wetland and restore and preserve natural and beneficial functions
- Minimize means to reduce harm to the smallest possible degree



IV-16

Step 6: Reevaluate Alternatives

- Is it still practicable at a floodplain or wetland site in light of exposure to flood risk and potential disruption of natural values?
- Is the alternative that was rejected at Step 3 still practicable in light of information gained from Steps 4 and 5?



IV-17

Step 7: Final Public Notice

If FEMA decides to take an action that will affect a floodplain or wetland:

- Provide a statement of this decision
- Explain the relevant factors used to make the determination



IV-18

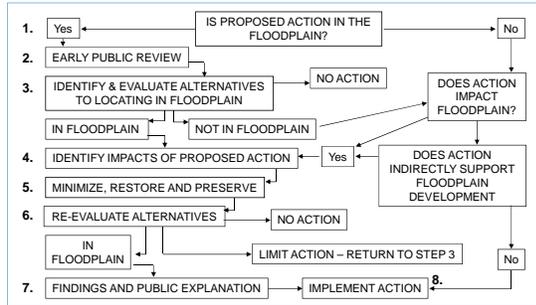
Step 8: Implement Action

- Implement the action
- Monitor the action to ensure that it is carried out as decided



IV-19

8-Step Process Diagram



IV-20

Check on Learning



Unit IV Review



IV-21

Unit V

Step 1 – Determine Location of Proposed Action



Unit V Objectives



- Explain the Step 1 tasks
- Use a Flood Hazard Boundary Map, Flood Insurance Rate Map, or FIRMette to gather floodplain data
- Use the "Wetlands Mapper" to gather wetlands data



V2

Unit V Objectives (cont.)



- Describe the scope of action
- Explain how to gather field data
- Recognize critical actions and their higher standard



V3

8-Step Decision-Making Process

→ Step 1	Determine Proposed Action Location
Step 2	Early Public Notice
Step 3	Identify Alternative Actions
Step 4	Identify Impacts
Step 5	Minimize Adverse Impacts
Step 6	Reevaluate Alternatives
Step 7	Final Public Notice
Step 8	Implement Action



V-4

Information Needed

FEMA determines whether the proposed action is located in a floodplain or a wetland:

- 100- and 500-year floods
- Location of floodways
- Location of coastal high hazard areas
- Flooding characteristics
- Location of wetland



V-5

Flooding Characteristics

- Velocity of floodwater
- Rate of rise of floodwater
- Duration of flooding
- Availability of warning system and evacuation routes
- Presence of levees, erosion, subsidence, sink holes, etc.
- Flood frequency or return interval



V-6

Discussion Question



What are some questions to ask to determine if data is current?



V.7

Use Complete Data

- Does the flood map delineate the floodway?
- Does the flood map delineate the 500-year floodplain boundaries?
- Does the flood map indicate if the area near the site of the proposed action was studied in detail?



V.8

Document Data Source



- Anecdotal data - who provided the data and when?
- Written data – what is the source?
- A FIRM – what is the community panel number and map date?



V.9

Discussion Question



Why is it important to document your data source?



V-10

Gather Field Data



- Visit proposed action site
- Take site photographs
- Talk to applicants and others in the area
- Gather environmental information



V-11

Discussion Question



What can you look for on a site visit to identify if the site is a floodplain or wetland?



V-12

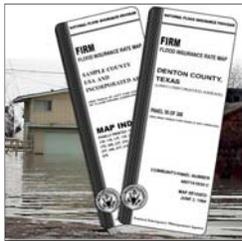
Floodplain Determination

- Flood Hazard Boundary Map (FHBM)
- Flood Boundary Floodway Map (FBFM)
- Flood Insurance Rate Map (FIRM)
- Flood Insurance Study (FIS)



V-13

Flood Insurance Rate Map (FIRM)

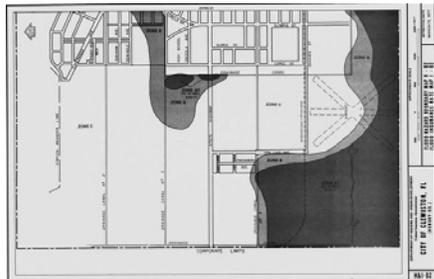


FEMA identifies flood risk for communities on maps known as Flood Insurance Rate Maps (FIRMs)



V-14

Flood Hazard Boundary Map (FHBM)



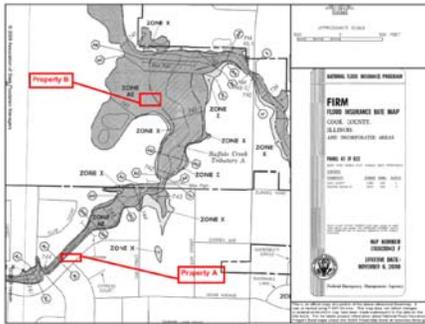
V-15

Flood Boundary and Floodway Map (FBFM)



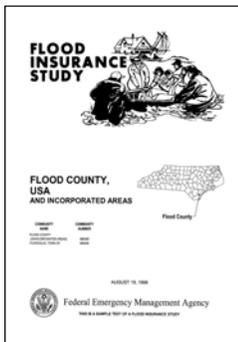
V-16

Example FIRM



V-17

Example FIS: Cover



V-18

Facilities Outside Floodplain

- Is the site near a body of water and not shown as being in a flood hazard area?
- Does the project have the potential to encourage, allow, support, or facilitate additional floodplain development?
- Would access to the project be restricted during a flood, adversely affecting the project and/or occupants (evacuation)?



V-19

Discussion Question



What other sources might provide flood hazard data?



V-20

How to Read Flood Maps



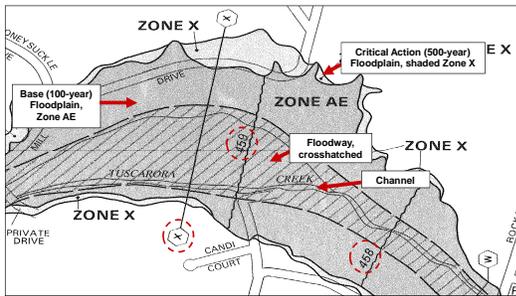
V-21

FIRM Panel Information



V-22

Reading Flood Maps



V-23

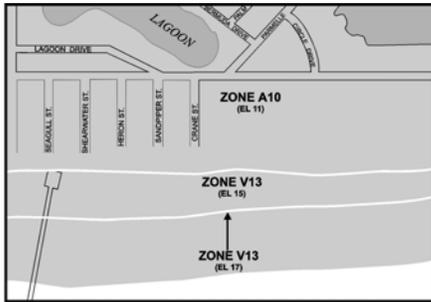
Example FIS: Table of Contents

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V-24

Flood Insurance Risk Zones (cont.)



V-28

Finding the Correct FIRM Panels

- Each community/county maintains an Index of its FIRM panels
- For FIRMs located on the FEMA web Site, the Index usually is the last map in the list of maps for a community or county



V-29

FEMA Map Service Center

- Distribution center for the National Flood Insurance Program
- Over 400,000 unique products
- Over 1.3 million products distributed annually
- Approximately \$1 million in revenue annually
- Products accessible 24-7



V-30

Obtaining Flood Maps

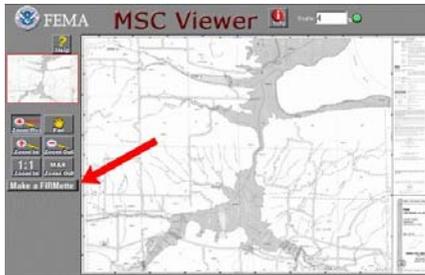
Map Service Center (MSC)

- 1-800-358-9616
- www.msc.fema.gov



V-31

Creating FIRMettes



www.msc.fema.gov



V-32

Making Wetland Determinations



V-33

Sources of Information

- Consult U.S. Fish and Wildlife Service
- Other Federal sources (e.g., USACE, EPA)
- State agencies like Department of Natural Resources
- Local agencies



V-34

Wetlands Mapper



- Provides views and access to the newest wetlands habitat data
- Allows users to build, search, query, and download custom digital maps and data in the area of their choice

www.fws.gov



V-35

Unit VI

Steps 2 and 7 – Public Notice Requirements



8-Step Decision-Making Process

- **Step 1:** Determine Proposed Action Location
- ➔ ▪ **Step 2:** Early Public Notice
- **Step 3:** Identify Alternative Actions
- **Step 4:** Identify Impacts
- **Step 5:** Minimize Adverse Impacts
- **Step 6:** Reevaluate Alternatives
- ➔ ▪ **Step 7:** Final Public Notice
- **Step 8:** Implement Action



VI-2

Unit VI Objectives



- Explain tasks in Steps 2 and 7
- Discuss public involvement
- Identify appropriate public notice methods



VI-3

Public Notice – 44 CFR Part 9

Provide adequate information to enable the public to give input on decisions related to actions that have the potential to adversely affect, or be affected by, floodplains or wetlands



Who should be included in the public notification about this type of activity?



VI-4

Public Notice Tasks

Factors to Consider:

- Scale/Complexity
- Potential for Controversy
- Public Need
- Number Affected
- Potential Impact
- Similarity of Actions



VI-5

Step 2: Early Public Notice (cont.)

Factors to consider in making decisions

- Method of public notice
- Content of public notice
- Timing of public notice
- Adequate comment period
- Post-disaster, acceptability of including several actions in one notice
- Continuing public notice
- Area of media coverage



VI-6

Discussion Question



What methods would be most useful for notifying the public when an action is of primarily local importance?



VI-7

Types of Public Involvement Events

- Public hearing
- Public meeting or workshop
- Public comment period



VI-8

Types of Public Involvement Events (cont.)

Factors to consider when deciding type

- Community tradition
- Project complexity
- Number of people that will be affected
- Potential for controversy
- Potential impacts of the project



VI-9

Discussion Question



If you lived in a community that was considering taking actions in the floodplain, what information would you need to be fully informed and be included in the Early Public Notice ?



VI-10

Step 7: Final Public Notice

Happens after careful review of alternatives, analysis of impacts, creation of a mitigation strategy, and **before** implementation

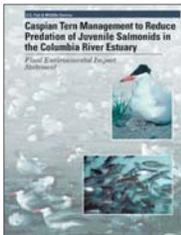


Why is it important to provide Final Public Notice before implementation of the action?



VI-11

Step 7: Final Public Notice (cont.)



Requirements

- Send notice to all who received Early Public Notice
- Final EIS is usually adequate to constitute Final Public Notice
- Notice of Finding of No Significant Impact (FONSI) is adequate to constitute Final Public Notice



VI-12

Step 7: Final Public Notice (cont.)

Requirements (cont.)

- Factors to consider in making decisions
- Content of public notice
- Waiting period of at least 15 days



VI-13

Other Public Notice Tasks

- Set Adequate Comment Period
- Continue Public Notice
- Issue Final Public Notice



VI-14

Addressing Public Comments

- Acknowledge comments received
- Make comments part of the public record
- Establish a timeframe for receiving public comments
- Keep a written record of public involvement events
- Analyze impacts or alternatives suggested by the public



VI-15

Questions or Comments?



VI-16



FEMA

Unit VII

Step 3 – Identify Alternative Actions



8-Step Decision-Making Process

Step 1	Determine Proposed Action Location
Step 2	Early Public Notice
→ Step 3	Identify Alternative Actions
Step 4	Identify Impacts
Step 5	Minimize Adverse Impacts
Step 6	Reevaluate Alternatives
Step 7	Final Public Notice
Step 8	Implement Action



VII-2

Unit VII Objectives



- Explain the tasks involved in Step 3
- Discuss considerations of alternative sites, alternative actions, and no action
- Provide examples of factors to consider in evaluating alternative actions
- Assess practicable alternatives in a hypothetical case example



VII-3

Discussion Question



How do you interpret the term “practicable”?



VII-4

Purpose of Step 3

The Water Resource Council Guidelines and 44 CFR Part 9.4 defines “**practicable**” as:

“**doable within existing restraints**”



VII-5

Purpose of Step 3 (cont.)

Preliminary Analysis	44 CFR Part 9 Requirement
There is a practicable alternative to locating an action in a floodplain or wetland	Act on that basis
Act in the floodplain or wetland	Continue completing all steps of the 8-step decision-making process



VII-6

Discussion Question



Who might identify potential alternative actions?



VII-7

Implementing Step 3

Potential Alternatives

- Alternative sites outside the floodplain or wetland
- Alternative actions that serve the same purpose as the proposed action but have less potential to affect or be affected by the floodplain or wetlands
- Taking no action



VII-8

Implementing Step 3 (cont.)

Analyze Alternatives Practicability



- Natural environment
- Social concerns
- Economic aspects
- Legal constraints



VII-9

Discussion Question: Natural Environment



What should be considered in determining the potential for negative impacts during the construction phase or life of the action?



VII-10

Discussion Question: Social



What will determine community acceptance and the effect on population segments?



VII-11

Discussion Question: Economic



What can affect the actions cost effectiveness, potential funding sources, and the potential impact on economic conditions?



VII-12

Discussion Question: Legal



What may create potential for legal challenges?



VII-13

Check on Learning



Preliminary determination of the practicability of alternative actions



IV-14

Check on Learning

Alternative Actions	Social		Legal	Economic		Environmental			Total Score of Each Proposed Alternative Action	
	Community Acceptance	Effect on Segment of Population	Authority to Act	Potential Legal Challenge	Benefits of Action	Cost of Action	Effect on Land/Water	Effect on Endangered Species		Effect on Hazards
Rebuild bridge as originally constructed	6	7	8	NA	8	6	5	6	NA	46
Rebuild and elevate original bridge to restore destroyed wetland areas	10	9	10	NA	10	2	8	9	NA	58
Move bridge to an alternate location where minimal wetland area would be impacted	3	3	6	NA	2	1	8	10	NA	33
Do not rebuild bridge	1	2	1	3	1	9	8	10	NA	35



VII-15



Unit VIII

Step 4 – Identify Impacts



Unit VIII Objectives



- Explain tasks involved in Step 4
- List positive and negative impacts on and from the floodplain or wetland
- Address the proposed action's impact
- Identify sources of information for identifying impacts



VIII-2

8-Step Decision-Making Process

Step 1	Determine Proposed Action Location
Step 2	Early Public Notice
Step 3	Identify Alternative Actions
→ Step 4	Identify Impacts
Step 5	Minimize Adverse Impacts
Step 6	Reevaluate Alternatives
Step 7	Final Public Notice
Step 8	Implement Action



VIII-3

Discussion Question



Why is it important to identify impacts?



VIII-4

Step 4 – Identify Impacts

Will the Proposed Action:

- Increase the structure/facilities useful life
- Maintain the investment at risk and exposures of lives to flood hazards
- Forego opportunities to restore floodplains/wetlands natural and beneficial values



VIII-5

Types of Impacts

Positive and negative
Direct and indirect
Concentrated and dispersed
Cumulative
Short- and long-term



VIII-6

Implementing Step 4

Consider and Evaluate

- Impacts associated with floodplains/wetlands modifications
- Impacts when actions support subsequent actions that additionally impact floodplains/wetlands
- Adverse impacts of proposed actions
- Factors related to flood hazard, natural values, and survival/quality of wetlands



VIII-7

Extent of Impact Identification



- Step 4 analysis must be sufficient to reveal potential consequences of the proposed actions and alternative actions in order to move to Step 5: Minimization of Adverse Impacts
- Impact identification must consider actions of other Federal, State, and local governments



VIII-8

Check on Learning



**Impact
Identification**



VIII-9

Impact Identification

- **Proposed Action #1:**
 - Replace a damaged sewage treatment plant on a populated barrier island
- **Proposed Action #2:**
 - Repair a section of a levee that has been damaged by flooding
- **Proposed Action #3:**
 - Develop a (temporary housing) mobile home group site in the floodplain
- **Proposed Action #4:**
 - Rebuild a destroyed firehouse that is in a country which is 95% SFHA



VIII-10

Questions or Comments?



VIII-11



FEMA

Unit IX

Step 5 – Minimize Adverse Impacts



8-Step Decision-Making Process

Step 1	Determine Proposed Action Location
Step 2	Early Public Notice
Step 3	Identify Alternative Actions
Step 4	Identify Impacts
→ Step 5	Minimize Adverse Impacts
Step 6	Reevaluate Alternatives
Step 7	Final Public Notice
Step 8	Implement Action



IX-2

Unit IX Objectives



- Explain the tasks involved in Step 5
- Identify and describe minimum standards
- Explain general requirements and specific minimization standards
- Describe measures to minimize harm to and within the floodplain and wetlands



IX-3

Discussion Question



How do you differentiate between the terms **minimize** and **mitigate**?



IX-4

44 CFR Part 9.11

FEMA shall minimize:

- Potential harm to lives and investment at risk from base flood or 500-year flood
- Potential adverse impacts on others
- Potential adverse impacts to floodplain and wetland values



IX-5

Minimization Standard 1

No new construction or substantial improvement in a floodway, and no new construction in coastal high hazard areas except for:



- Functionally dependent use
- Structure or facility that facilitates open space use



IX-6

Discussion Question



What are examples of a structure or facility that facilitates open space use?



IX-7

Minimization Standards 2 and 3

Minimization Standard 2

For structures that have a functionally dependant use or facilitates open space use:

No construction in coastal high hazard area unless elevated on pilings or columns above the BFE and anchored

Minimization Standard 3

No new construction or substantial improvement unless the lowest floor is at or above the base flood elevation



IX-8

Minimization Standard 4

No encroachments within a regulatory floodway that would result in any increase in flood levels during the occurrence of the base flood event



What are some examples of encroachments?



IX-9

Minimization Standards 5 and 6

Minimization Standard 5

Functionally dependent use or facilitates open space use, allowed in floodway or coastal high hazard area only if:

- Site is only practicable alternative
- Harm to and within floodplain or wetland is minimized

Minimization Standard 6

No action may be taken if inconsistent with the NFIP or any more restrictive floodplain laws, regulations, or ordinances



IX-10

Minimization Standard 7

New construction in coastal high hazard area must be elevated on open works such as walls, columns, break-away, lattice, and piers



 *Why would open works be required?*



IX-11

Minimization Standard 8

Minimize flood effects on human health, safety, and welfare.

 *What are some suggestions for this minimization standard?*



IX-12

Minimization Standard 9

Minimization Standard 9

In replacing building contents, require disaster-proofing and/or relocating of building and contents



IX-13

Restoration

44 CFR 9.11 requires FEMA to:

- Restore and preserve natural and beneficial floodplain values
- Preserve and enhance natural and beneficial wetland values



What does floodplain or wetland restoration mean?



IX-14

Restoration (cont.)

- Re-establish the natural floodplain or wetland environment
- Identify how past actions have diminished floodplain or wetland natural abilities
- If practicable as part of a new action, implement measures to restore lost functions



IX-15

Discussion Question



How do we “preserve” the floodplain or wetlands?



V-16

Mitigation

- Taking steps to reduce the risk of harm or damage
- Long-term impact
- Minimize negative impacts to the extent possible



IX-17

Elevation of Structures

- No new construction or substantial improvement of structures unless lowest floor (including basement) is at or above BFE
- No new construction or substantial improvement of structures involving critical action unless lowest floor (including basement) is at or above 500-year flood level
- If the structure is nonresidential, then it can be flood proofed

If the previous three do not apply then there can be a variance granted as long as it is consistent with 44 CFR 60.6 (a)



IX-18

Elevation of Structures (cont.)

Elevation to or Above the Base Flood Level



IX-19

Elevation of Structures (cont.)

Elevation to or Above the 500-Year Flood Level



IX-20

Flood-Proofing

44 CFR 9.9 allows for flood-proofing non-residential structures



IX-21

Small Group Activity



Minimizing Impacts



IX-22

Minimization Standards for Protecting the Natural Environment



IX-23

Questions or Comments?



IX-24

Unit X

Step 6 – Reevaluate Alternatives



8-Step Decision-Making Process

- **Step 1:** Determine Proposed Action Location
- **Step 2:** Early Public Notice
- **Step 3:** Identify Alternative Actions
- **Step 4:** Identify Impacts
- **Step 5:** Minimize Adverse Impacts
- **Step 6:** Reevaluate Alternatives
- **Step 7:** Final Public Notice
- **Step 8:** Implement Action



X-2

Unit X Objectives



- Explain the tasks involved in Step 6
- Identify factors to consider in reevaluating the proposed action
- Identify differences between Step 3 and Step 6
- Apply Step 6 to the Case Study



X-3

Step 6 – Reevaluate Alternatives

- Having determined the proposed action's impact in Step 4
- Having identified measures necessary to comply with minimization in Step 5

ASK: Are alternatives, whether tentatively accepted or rejected as part of Step 3, practicable based on Steps 4 and 5?



X-4

Step 6 – Reevaluate Alternatives

Determine:

- Is it still practicable despite exposure to flood risk and disruption of natural functions?
- Can it be limited to increase practicability of alternatives preliminarily rejected?
- Can minimization be achieved?



X-5

No Action in Floodplain

- Avoid support of floodplain development
- Reduce the risk of flood loss
- Minimize the impact of floods on humans
- Restore and preserve floodplain functions



X-6

No Action in Wetland

- Avoid destruction or modification of wetlands
- Avoid support of new construction in wetlands
- Minimize destruction, loss or degradation of wetlands
- Preserve and enhance natural functions of wetlands



X-7

44 CFR Part 9.9

No Action Alternative

- Weigh the practicability of the floodplain or wetland action against the no action alternative
- To be a practicable location, the importance of the action must outweigh requirements of EOs 11988 and 11990



X-8

When to say No



X-9

How many homes impacted?



Unit XIII

Course Review and Conclusion

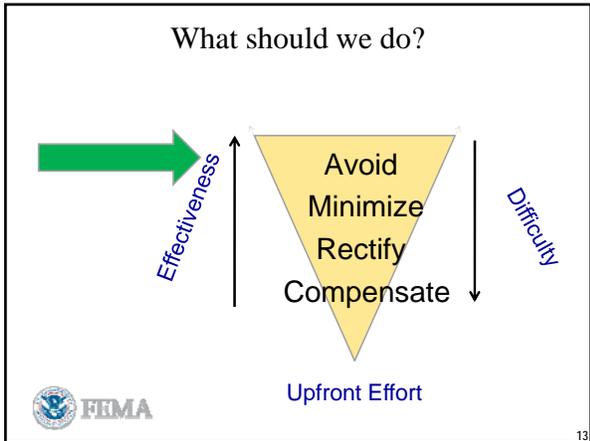


8-Step Decision-Making Process

Step 1	Determine Proposed Action Location
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IV-12



- ### What is the value added?
- Delay in Project
 - Discourages poor proposals
 - Additional costs for administrative review
 - Pay a little now or a pay a lot later
 - Unnecessary work
 - Good decisions require careful thought = better results
 - Good economic sense
 - Supports innovation
- FEMA
- 14

Questions or Comments?

FEMA

X-15