Unit II
Floodplain Management Basics

Unit II Objectives

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

Unit II Objectives (cont.)

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

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

Types of Floodplains
- Riverine
- Coastal
- Special floodplain areas
Riverine Floodplains

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

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

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
Special Floodplain Areas

- Sheet flow or shallow flooding areas
- Wetlands
- Sinkholes

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

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
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

Base Floodplain

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

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
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

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

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.
Why the 1% Chance Flood?

1% Chance Flood
Excessive exposure to flood risk

0.1% Chance Flood
Excessive standard

Special Flood Hazard Area (SFHA)
- Area where NFIP floodplain management regulations must be enforced
- Also known as Base Floodplain

Flood Hazard Boundary Map (FHBM)
Flood Boundary and Floodway Map (FBFM)

Flood Insurance Rate Map (FIRM)

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

Flood Zones in SFHAs

<table>
<thead>
<tr>
<th>Zone</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Zone</td>
<td>Any area within the SFHA without an established BFE</td>
</tr>
<tr>
<td>AE Zone</td>
<td>BFE has been determined through an engineering analysis called a Flood Insurance Study (FIS)</td>
</tr>
<tr>
<td>AO Zone</td>
<td>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.</td>
</tr>
<tr>
<td>AH Zone</td>
<td>Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet.</td>
</tr>
</tbody>
</table>
Flood Zones in SFHAs (cont.)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V Zone</td>
<td>Coastal area where there is a velocity hazard due to wave action</td>
</tr>
<tr>
<td>VE Zone</td>
<td>Coastal area with velocity hazard due to wave action and for which BFE has been determined</td>
</tr>
</tbody>
</table>

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 faculties.
- **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.

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?"
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?

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

Discussion Question

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

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

Check on Learning

Review of Floodplain Management Terms
## 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

### Floodplain Functions

- **Water Resource**
- **Living Resources**
- **Cultural Resources**

### Water Resources

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

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

Cultural Resources

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

Cultivated Resources

- Agriculture
- Aquaculture
- Forestry
- Recreational fisheries
- Shell fisheries
Floodplain Management

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

Source: Iowa Dept. of Natural Resources

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?

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
Video: Protecting Structures in a Floodplain
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

Discussion Question

What is a wetland?
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.

Characteristics of Wetlands

Characteristics of wetlands vary, but share ecological similarities:

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

Marshes

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

Source: www.refugenet.org
Swamps

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

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

Slough

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

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 __________.

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

### 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

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

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

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.
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
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

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
**Actions vs. Critical Actions**

- **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

- **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?
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?

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

8-Step Decision-Making Process

<table>
<thead>
<tr>
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<tr>
<td>Step 8</td>
<td>Implement Action</td>
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</table>
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

8-Step Decision-Making Process

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?
Step 2: Early Public Notice

Keep the public informed and involved early and often

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

Step 4: Identify Impacts

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

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?

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
Step 8: Implement Action

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

8-Step Process Diagram

1. **Is proposed action in the floodplain?**
   - Yes
   - No

2. **Early Public Review**
3. **Identify & Evaluate Alternatives to locating in floodplain**
   - In floodplain
   - Not in floodplain
   - No Action
4. **Identify impacts of proposed action**
   - Yes
   - No
   - Does action impact floodplain?
5. **Minimize, restore and preserve**
6. **Re-evaluate alternatives**
   - In floodplain
   - Not in floodplain
   - Limit action – Return to step 3
   - No action
7. **Findings and public explanation**
8. **Implement action**

Check on Learning

Unit IV Review
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

Unit V Objectives (cont.)

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

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

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
Discussion Question

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

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?

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?
Discussion Question

Why is it important to document your data source?

Gather Field Data

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

Discussion Question

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

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

Flood Insurance Rate Map (FIRM)

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

Flood Hazard Boundary Map (FHBM)
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)?

Discussion Question

What other sources might provide flood hazard data?

How to Read Flood Maps
FIRM Panel Information

Reading Flood Maps

Example FIS: Table of Contents
Example FIS: Flood Profile

Flood Insurance Risk Zones

Flood Insurance Risk Zones (cont.)
Flood Insurance Risk Zones (cont.)

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

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
Obtaining Flood Maps

Map Service Center (MSC)

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

Creating FIRMettes

www.msc.fema.gov

Making Wetland Determinations
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

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
8-Step Decision-Making Process

- **Step 1**: Determine Proposed Action Location
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- **Step 8**: Implement Action

Unit VI Objectives

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

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Public Notice Tasks

Factors to Consider:
- Scale/Complexity
- Potential for Controversy
- Public Need
- Number Affected
- Potential Impact
- Similarity of Actions

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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
Discussion Question

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

Types of Public Involvement Events

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

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
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?

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?

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
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

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

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
Unit VII

Step 3 – Identify Alternative Actions

8-Step Decision-Making Process

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</table>

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
**Discussion Question**

How do you interpret the term “practicable”?

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**Purpose of Step 3**

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

“doable within existing restraints”

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**Purpose of Step 3 (cont.)**

<table>
<thead>
<tr>
<th>Preliminary Analysis</th>
<th>44 CFR Part 9 Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a practicable alternative to locating an action in a floodplain or wetland</td>
<td>Act on that basis</td>
</tr>
<tr>
<td>Act in the floodplain or wetland</td>
<td>Continue completing all steps of the 8-step decision-making process</td>
</tr>
</tbody>
</table>
Discussion Question

Who might identify potential alternative actions?

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

Implementing Step 3 (cont.)

Analyze Alternatives Practicability

- Natural environment
- Social concerns
- Economic aspects
- Legal constraints
Discussion Question: Natural Environment

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

Discussion Question: Social

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

Discussion Question: Economic

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

What may create potential for legal challenges?

Check on Learning

Preliminary determination of the practicability of alternative actions

Check on Learning

<table>
<thead>
<tr>
<th>Alternative Actions</th>
<th>Social</th>
<th>Legal</th>
<th>Economic</th>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebuilt bridge on existing foundation</td>
<td>0</td>
<td>7</td>
<td>5</td>
<td>NA</td>
</tr>
<tr>
<td>Rebuilt and separate bridge to replace damaged original area</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>NA</td>
</tr>
<tr>
<td>New bridge in an alternative location where minimal traffic area would be impacted</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>NA</td>
</tr>
<tr>
<td>Disadvantages: bridge</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
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

8-Step Decision-Making Process

- **Step 1**: Determine Proposed Action Location
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- **Step 7**: Final Public Notice
- **Step 8**: Implement Action
Discussion Question

Why is it important to identify impacts?

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

Types of Impacts

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

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

Check on Learning
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

Questions or Comments?
Unit IX

Step 5 – Minimize Adverse Impacts

8-Step Decision-Making Process

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

**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

**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
Discussion Question

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

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

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?
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

Minimization Standard 7
New construction in coastal high hazard area must be elevated on open works such as walls, columns, breakaway, lattice, and piers

Why would open works be required?

Minimization Standard 8
Minimize flood effects on human health, safety, and welfare.

What are some suggestions for this minimization standard?
Minimization Standard 9

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

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?

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
Discussion Question

How do we “preserve” the floodplain or wetlands?

Mitigation

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

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)
Elevation of Structures (cont.)

Elevation to or Above the Base Flood Level

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Elevation of Structures (cont.)

Elevation to or Above the 500-Year Flood Level

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Flood-Proofing

44 CFR 9.9 allows for flood-proofing non-residential structures
Small Group Activity

Minimizing Impacts

Minimization Standards for Protecting the Natural Environment

Questions or Comments?
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

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
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?

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?

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

[Image of a floodplain scene]
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

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

When to say No
Unit XIII

Course Review and Conclusion

8-Step Decision-Making Process

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What should we do?

Avoid
Minimize
Rectify
Compensate

What is the value added?

- Delay in Project
- Discourages poor proposals
- Pay a little now or pay a lot later
- Additional costs for administrative review
- Good decisions require careful thought = better results
- Unnecessary work
- Good economic sense
- Supports innovation

Questions or Comments?