Using FEMA's Mitigation Resources to Achieve Co-Benefits of Flood Resiliency and Fish Habitat Improvements

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What's the Problem?

Development activities have contributed to a myriad of interrelated factors causing the decline of species considered in this opinion. Among the most important of these are changes in stream channel morphology; reduced instream roughness and cover; loss and degradation of off-channel areas, refugia, estuarine rearing habitats, riparian areas, spawning areas, and wetlands; degradation of water quality (e.g., temperature, sediment, dissolved oxygen, contaminants); and blocked fish passage. (NMFS 2016)

- Filling floodplains and wetlands;
- Straightening and armoring rivers;
- Reducing available in- and off-channel habitat;
- Simplifying remaining habitat;
- Restricting lateral channel movement;
- Accelerating flow velocities;
- Increasing erosion;
- Decreasing cover;
- Reducing prey sources;
- Modifying stormwater runoff pathways;
- Reducing groundwater infiltration;
- Modifying subsurface flows;
- Increasing flood elevations;
- Contributing contaminants;
- Increasing water temperatures;
- Degrading water quality;
- Reducing water quantity;
- Removing riparian vegetation;
- Modifying floodplain forest development; *and*
- Reducing quantity and quality of in-channel shade and wood.

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Fixing Past Problems

- Riparian Enhancement
  - Addresses loss of canopy cover (stream shading),
  - Improves stand structure and composition diversity.
  - Remove invasive non-native monocultures that have developed.

- In-water Restoration
  - Improved access to previous lost or hard to reach fish habitat
  - Replaces large wood and structure complexity to the waterway.
  - Addresses past issues with riverine channelization and levee confinement.
  - Replaces or mitigates Rip Rap placement and other hardened stream banks.

- Floodplain Connectivity and Restoration
  - Reconnect riverine-floodplain interactions & addresses stream incision
  - Replaces flood storage opportunities
  - Remove surface hardening

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Typical EHP Considerations

- NEPA
  - Depends on the Proposed Project. More complex projects may need EA or even an EIS.
- NHPA
  - If there is new ground disturbance, then the Project may need consultation or cultural survey.
  - Needed Info: Spatial Area files (.kmz, .lyr, and/or .gdb). Dimensions of any proposed new ground disturbance. Hand tools vs Mechanized Equipment.
- CWA
  - If proposal is to work within the OHWM or wetlands, start coordination with USACE regulator.
- MBTA
  - Remove vegetation in the fall to avoid impacts to nesting birds.
  - Check for nests and avoid them during clearing operations.
  - If proposing substantial vegetation clearing during the nesting season, *and* cannot avoid active nests, then expect the need to coordinate with your MBTA office
    - WA/OR/ID [Region 1] 503-872-2715 or PermitsR1MB@fws.gov
    - AK [Region 7] 907-786-3693 or PermitsR7MB@fws.gov
- Floodplains & Wetlands

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ESA & MSA Considerations

FESP Coverage [link: https://repository.library.noaa.gov/view/noaa/24208]

Some projects require verification from NMFS (occurs within 30 days)

Some project types require notification but do not need verification

- General
  - Project Design (PDC 12)
  - In-Water Work Timing (PDC 13)
  - Fish Capture and Release (PDC 14)
  - Work Area Isolation (PDC 15)
  - Fish Screens (PDC 16)
  - Site Layout and Flagging (PDC 17)
  - Staging, Storage, and Stockpile Areas (PDC 18)
  - Pollution and Erosion Control (PDC 19)
  - Temporary Access Roads and Paths & Stream Crossings (PDC 21 and 22)
  - Equipment Vehicles, and Power Tools (PDC 24)
  - Fish Passage (PDC 28)
  - Construction Discharge Water (PDC 31)
  - Post Construction Stormwater Management (PDC 35)
  - Site Restoration and *Revegetation* (PDC 36 and 37)

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Riparian Projects

- **Good Plants In**
- **Bad Plants Out**

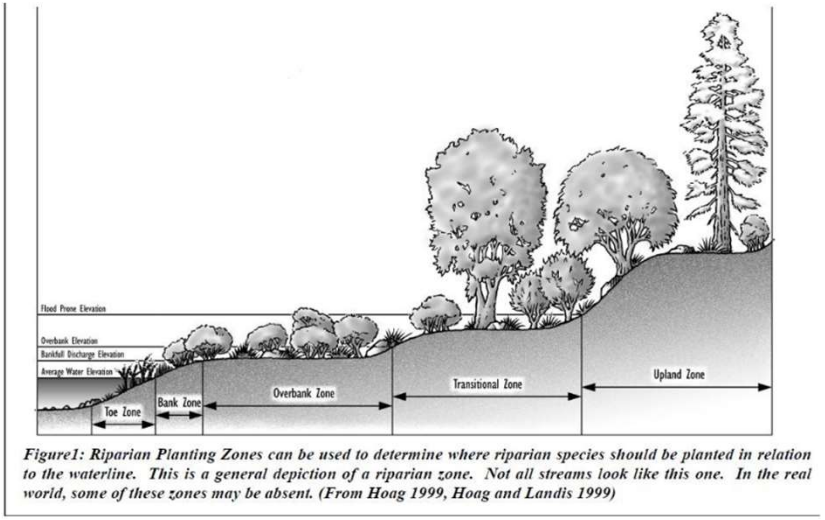

Figure1: Riparian Planting Zones can be used to determine where riparian species should be planted in relation to the waterline. This is a general depiction of a riparian zone. Not all streams look like this one. In the real world, some of these zones may be absent. (From Hoag 1999, Hoag and Landis 1999)

Riparian Planting Zones
From: USDA NRCS Trees and Shrubs for Riparian Planting
https://www.nrcs.usda.gov/plantmaterials/wapmstn13160.pdf

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Riparian Projects

A properly function riparian corridor provides stream shading, wood recruitment, and source of organic materials for invertebrates.

Native Riparian Plant Installation via Hand-tools or Mechanical Equipment

- *Revegetation (PDC 37).*

Non-native Removal via Mechanical and Herbicide Removal

- Invasive and Non-Native Plant Control (PDC 34).
  - Use of approved herbicides allows for FESP consultation (streamlined).
  - Proposing non-approved will require a separate lengthy formal consultation.

Plant Riparian Planting
From: Nooksack Salmon Enhancement Association

Himalayan Blackberry Mechanical Removal
From: Skagit Fisheries Enhancement Group
https://www.skagitfisheries.org/invasive-rundown/

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Riparian Projects

Allowed Herbicides and their Buffers (per the FESP)

SCA Intern Spot Spraying
From: National Park Service

Herbicide	No Application Buffer Width (feet)					
	Streams and Roadside Ditches with flowing or standing water present and Wetlands			Dry Streams, Roadside Ditches, and Wetlands		
	Broadcast Spraying	Spot Spraying	Hand Selective	Broadcast Spraying	Spot Spraying	Hand Selective
Labeled for Aquatic Use						
Aquatic Glyphosate	100	waterline	waterline	50	None	none
Aquatic Imazapyr	100	15	waterline	50	None	none
Aquatic Triclopyr-TEA	**Not Allowed**	15	waterline	**Not Allowed**	None	none
Low Risk to Aquatic Organisms						
Imazapic	100	15	bankfull elevation	50	None	none
Clopyralid	100	15	bankfull elevation	50	None	none
Metsulfuron-methyl	100	15	bankfull elevation	50	None	none
Moderate Risk to Aquatic Organisms						
Imazapyr	100	50	bankfull elevation	50	15	bankfull elevation
Sulfometuron-methyl	100	50	5	50	15	bankfull elevation
Chlorsulfuron	100	50	bankfull elevation	50	15	bankfull elevation
High Risk to Aquatic Organisms						
Picloram	100	50	50	100	50	50
Sethoxydim	100	50	50	100	50	50

*waterline is defined as the ordinary high water.
*bankfull elevation is defined as the elevation point at a given location along a river which is intended to represent the maximum water level that will not overflow the river banks or cause any significant damages from flooding.

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In Water Enhancement

- **Fish Passage**
- **Bank Stabilization**
- **Habitat Structures**
  - **LWD**
  - **Boulders**

McCaw Fish Habitat Restoration Project – Touchet River
(Walla Walla Conservation District)
https://www.wwccd.net/district-projects/mccaw-restoration-project/

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In Water Enhancement

A properly function riparian corridor provides stream shading, wood recruitment, and source of organic materials for invertebrates.

- Transportation
  - Road, culvert, and bridge repair, rehabilitation and replacement (PDC 39)
  - Stormwater facilities (PDC 40)
  - Utilities (PDC 41)
  - Streambank and channel stabilization (PDC 42)

- Restoration
  - *Streambank restoration (PDC 43)*
  - *Boulder placement for habitat restoration (PDC 44)*
  - Large wood placement (PDC 45)
  - *No verification when <25 percent bankfull cross-section*
  - Water control structure removal (PDC 48)

Big Creek, Douglas County, OR
Before and After

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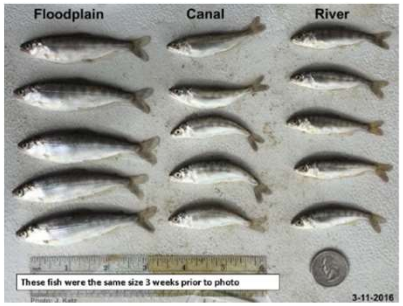
Floodplain Connectivity

- **Off Channel Storage**
- **Side Channel Connectivity**
- **High Flow Swales**
- **High Flow Engagement Structures**



Tucannon River Habitat Restoration Floodplain Connectivity
(Snake River Board)
https://snakeriverboard.org/tucannon-river-habitat-restoration/floodplain-connectivity/

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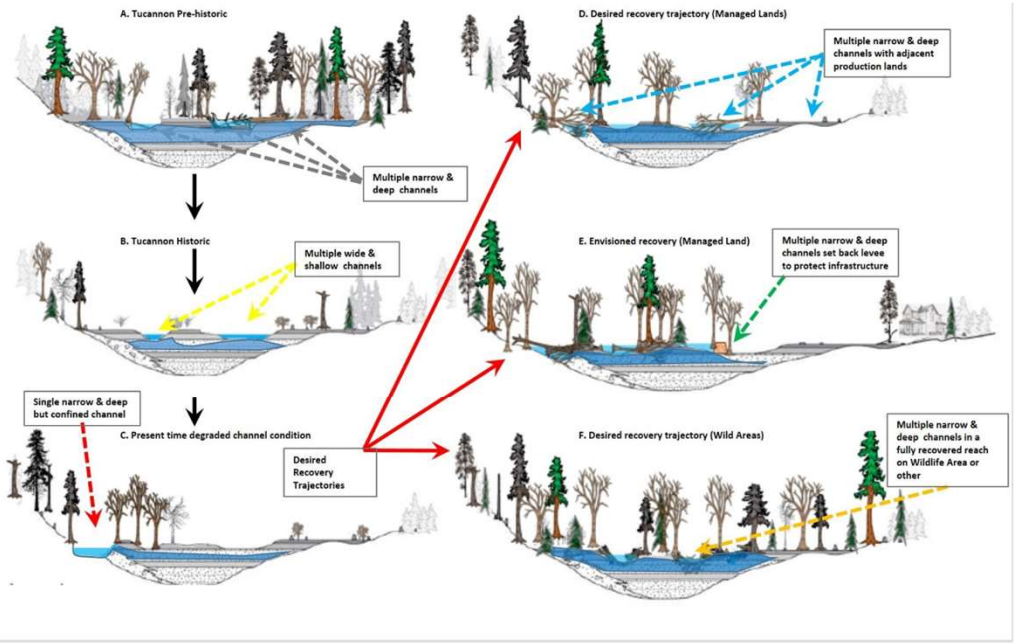
Floodplain Connectivity

A properly functioning floodplain with good connectivity results in flood storage, reduction in floodwater velocities, charging of groundwater, and surface water quality maintenance. Additional benefits are fish and wildlife benefits, general biological productivity, and human recreation.



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Floodplain Connectivity

- Floodplain connectivity
  - Off- and side-channel habitat restoration (PDC 46)
  - Set-back existing berms, dikes, and levees (PDC 47)

- Tillamook Southern Flow Corridor Project
  - The removal of over 40,000 feet of existing levee, construction of 9,000 feet of new setback levee, new flood drainage structures, removal and containment of contaminated soils, and about 500 acres of tidal habitat restoration
  - 12min Video https://youtu.be/96Nq0qGkox8

- To properly engage the floodplain, some projects may need to propose high flow structures to improve riverine-floodplain interaction
  - Note: This may result in water surface rise at designed flow intervals such as 2yr/5yr/15yr/25yr.

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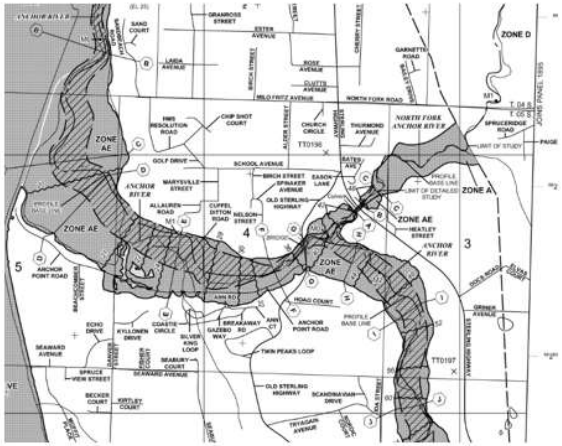

The floodway is a regulatory tool.

- Shows areas of especially high flood hazard.
- Makes permitting development in the floodway fringe much easier.
- Depends on strict enforcement of regulations to maintain conveyance.

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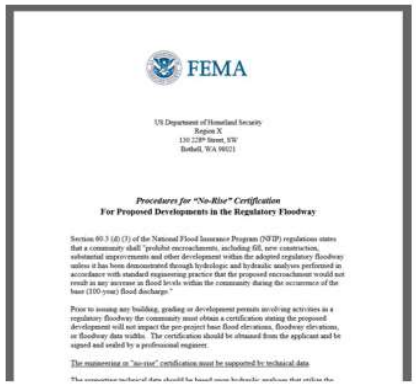
Community Responsibilities: H&H Analysis

- Communities must prohibit development in the floodway unless…
  - H&H analysis is submitted demonstrating no increase to the BFE (44 CFR 60.3(d)(3));
  - H&H analysis is performed to Region X standards; and
  - Analysis is reviewed and approved by the community.



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US Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021

Procedures for "No-Rise" Certification
For Proposed Developments in the Regulatory Floodway

Section 60.3 (d) (3) of the National Flood Insurance Program (NFIP) regulations states that a community shall "prohibit encroachments, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (100-year) flood discharge."

Prior to issuing any building, grading or development permits involving activities in a regulatory floodway the community must obtain a certification stating the proposed development will not impact the pre-project base flood elevations, floodway elevations, or floodway data widths. The certification should be obtained from the applicant and be signed and sealed by a professional engineer.

The engineering or "no-rise" certification must be supported by technical data

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Communities must protect their floodways.

Each NFIP community is responsible for all development that occurs in its floodways and must ensure that the proper analysis is performed, and all necessary permits are obtained.

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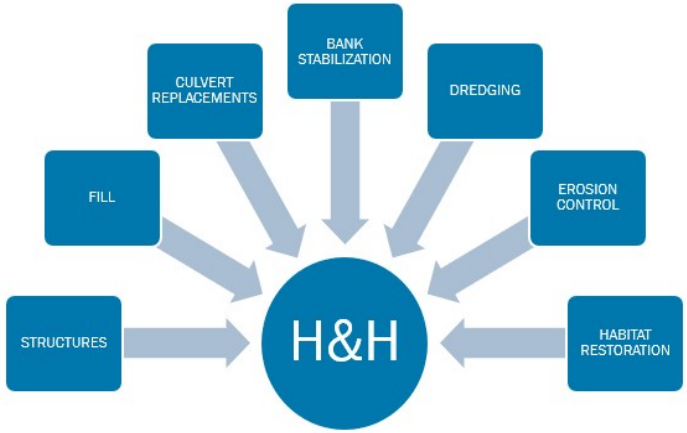
H&H Analysis: Types of Development



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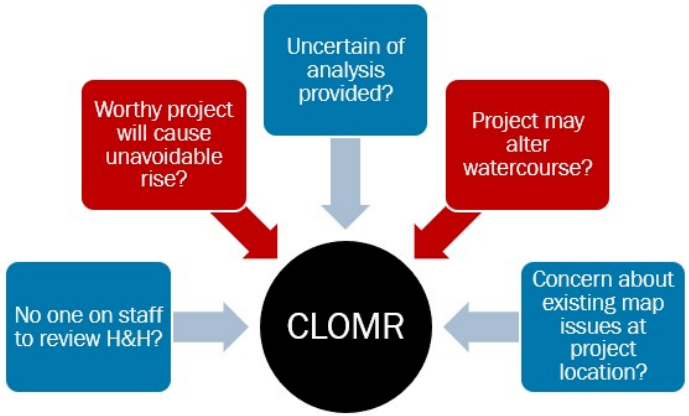
H&H Analysis and the Conditional Letter of Map Revision (CLOMR)



44 CFR 60.3(d)(4) and 72.2

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More about CLOMRs

- **A CLOMR is not FEMA approval of a project.**
- A CLOMR cannot be requested if the proposed rise occurs where there are existing structures.
- May conflict with local ordinances that prohibit rise in the floodway but do not mention the CLOMR option.
- A CLOMR does not change the maps or alter regulatory requirements.
- More info on the MT-2 Form instructions.

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Floodway Projects: Culvert Replacements

- When perched or undersized culverts are replaced, the dynamics of that watercourse are significantly altered.

Tributary to Hoh River, WA
WA Dept of Natural Resources

- Conveyance is increased. BFE is likely altered both upstream and downstream.
- **H&H analysis required.**
- **CLOMR/LOMR probably required.**

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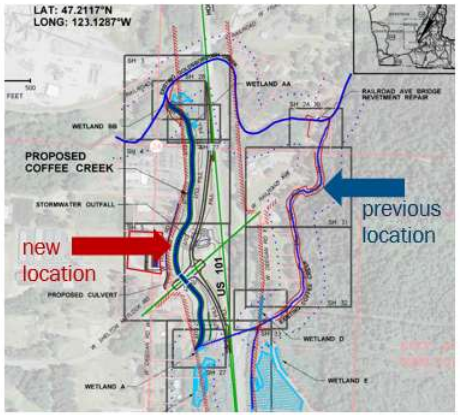
Floodway Projects: Culvert Replacements



Coffee Creek, WA
WA Dept of Transportation

- Sometimes culvert replacements involve relocating a stream by moving a crossing or confluence (e.g., road and highway projects).
- **H&H required.**
- **CLOMR/LOMR required.**

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Floodway Projects: Bank Stabilization/Restoration

- Regardless of its purpose, material placed in the floodway can alter river dynamics and raise BFE.
- **H&H analysis is required.**
- CLOMR/LOMR may be required.

Kenai River, AK

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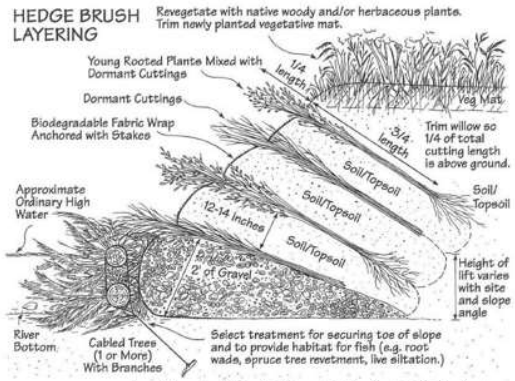
Floodway Projects: Planting and Revegetation

- Planting native vegetation alone does not require analysis.
- But revegetating eroded banks can involve soil wraps and other strategies that can turn the installation into a floodway encroachment.
- Encourage communities to ask questions when "planting native vegetation" is a bullet point on an application.
- **H&H analysis may be required.**



From *Streambank Revegetation and Protection, A Guide for Alaska*
AK Department of Fish & Game

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Floodway Projects: Engineered Log Jams (ELJ) and Large Woody Debris (LWD)

Upper Green River, WA
From *Large Wood Research Workshop Summary Report, 2012*
USACE and USBR

- Diverting currents and encouraging meanders can result in alterations to a watercourse and changes to flood risk.
- If improperly anchored, failed ELJs can be significant hazards downstream.
- **H&H analysis required.**
- CLOMR/LOMR likely required.

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Common Community Floodway Issues

"An H&H is too expensive – it costs more than my whole project."

"A CLOMR is too expensive and takes too long. Can I just submit a LOMR after I'm done?"

"I thought FEMA waived the H&H requirement for projects that had benefits for fish habitat."

OUTREACH OPPORTUNITY:

Encourage integration of floodplain permit and floodway analysis requirements into early planning, grant writing, and project design.

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Mitigation Funding

FEMA provides funding through its Hazard Mitigation Assistance (HMA) grant programs and Public Assistance (PA) for eligible mitigation activities that reduce disaster losses. States, local communities, tribes and territories are eligible to apply for funding. The Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) programs are on an annual application cycle. The Hazard Mitigation Grant Program (HMGP) and Hazard Mitigation Grant Program – Post Fire (HMGP Post Fire) are on a disaster application cycle. PA Mitigation funding is not on a funding cycle and is available as part of the recovery following each major disaster.

	Hazard Mitigation Assistance				Public Assistance
Funding Cycle	Annual Grants Cycle		Disaster Grants Cycle		
Mitigation Funding	**FMA**	**BRIC**	**HMGP**	**HMPG Post Fire**	**PA Mitigation**
When is the Notice of Funding Opportunity (NOFO) released	NLT August	NLT August	N/A	N/A	N/A
When can applicants apply?	Annually: September — January	Annually: September —January	Following the presidential declaration of a major disaster for up to 12 months	Following the declaration of a Fire Management Assistance Grant for up to 12 months	Funding is part of the recovery for each major disaster

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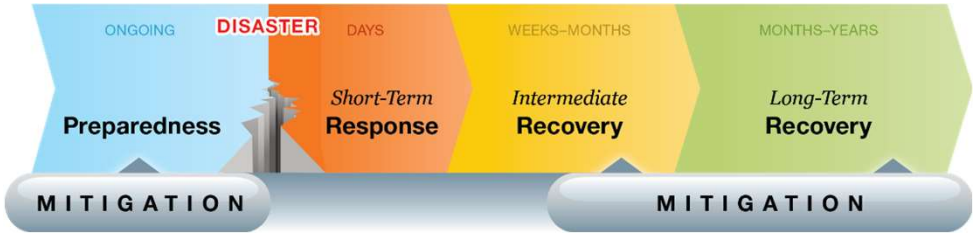
Hazard Mitigation

- Hazard Mitigation is the reduction or elimination of long-term risk to human life and property from natural hazards to help create strong, resilient communities.



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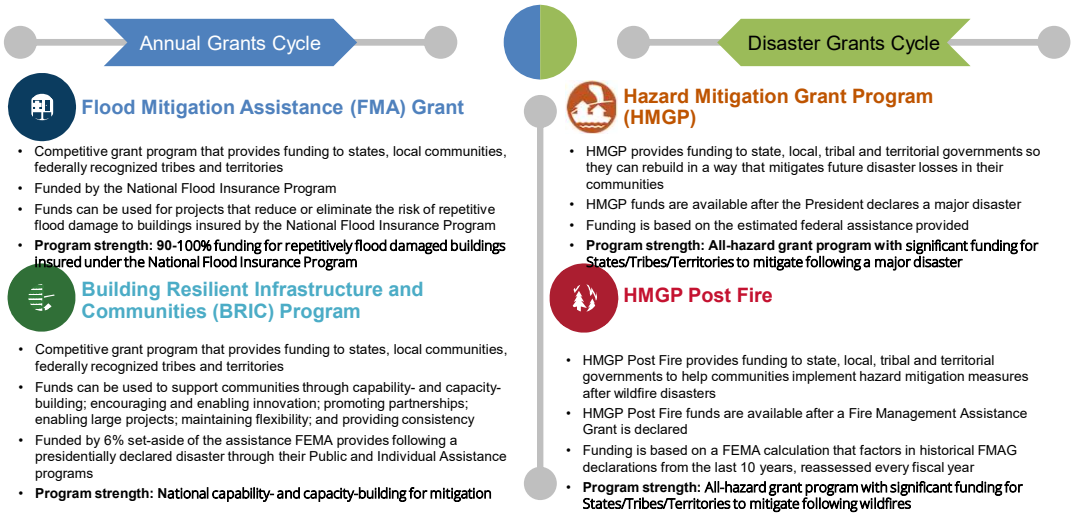
HMA Grant Program Overview



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