



Michigan Association of Planning
A Chapter of the American Planning Association

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Floodplain Management

Description

Floodplains are areas where floodwaters spread when the natural stream or river channel overflows its banks because it cannot accommodate runoff from storms or melting snow. Dissipation of flood waters into the floodplain helps reduce the amount of damage incurred by flooding. In addition to providing natural buffers for floods, floodplains provide critical functions as groundwater recharge areas and wildlife habitat. The most biologically diverse and productive habitats occur where land and water meet; floodplains outside of urban areas often display this unique characteristic.

When the floodplain is altered by grading, filling, or the erection of structures, its flood-dissipating functions are reduced. Oftentimes, changes to the natural system aggravate flooding and damages. Factors that increase flooding problems include:

- Removing vegetation that stabilizes banks of streams and rivers and slows flood waters.
- Erecting structures that deflect or inhibit flow of floodwaters can increase flood elevations and modify flow paths, shifting flooding problems and increasing erosion.
- Constructing bridges, culverts, buildings, or other structures that encroach on the floodplain and reduce the storage area available for floodwaters.
- Building drainage systems that quickly feed storm water into the receiving body.
- Channelizing streams (straightening meandering watercourses to expedite drainage) which transfers flooding problems downstream and alters wildlife habitat.
- Filling and dumping in floodplains. Even something as seemingly innocent as dumping lawn clippings and leaves in these "waste areas" can cause a

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considerable amount of damage as floodwaters rise and transport debris that can interfere with the movement of floodwaters.

Floodproofing, relocation of structures, and land acquisition are very expensive propositions compared to regulating development in floodplains. In Michigan, the September 1986 flood, for example, damaged an estimated 30,000 buildings at a cost exceeding \$500 million dollars. Social and psychological costs were also high. According to the U.S. Water Resources Council, "90% of all property losses from natural disasters in the United States are caused by flooding."

Once a flood has occurred, a community is in a poor position to plan for flood mitigation. It is important for communities to understand the nature of flooding and how it may affect them. Recognizing the problems in comprehensive planning efforts can help communities adequately prepare themselves for flood occurrences, and prevent aggravation of flood problems.

Planning Considerations

In response to widespread life and property loss associated with flooding, and to help those affected by floods, the federal government has promoted local floodplain management strategies through education programs and enactment of the National Flood Insurance Program (NFIP). The insurance program is basically the only source of flood insurance and is only available to property within communities participating in the NFIP. It is administered by the Federal Emergency Management Agency. In order to participate in the subsidized insurance program, communities are required to adopt and enforce regulations for development in flood-prone areas. Participation in the program is voluntary and relies heavily on state and local involvement. However, there is a strong incentive to participate, as FHA, VA, and other federally-insured mortgages are prohibited in identified floodplains, unless flood insurance is carried.

Augmenting federal protection measures, Michigan has implemented rules that require a permit to occupy, fill, or grade lands in a floodplain, streambed or channel of a stream. Federal Emergency Management Agency (FEMA) flood insurance studies, maps and other state data are used to determine floodplain boundaries. The flood area within the jurisdiction of state and federal programs is the 100-year floodplain. A 100-year flood (which results from approximately 5 inches of rainfall in 24 hours) has a one percent chance of occurring in any given year. This means that a structure in the 100-year floodplain has a 26% chance of being flooded before the average mortgage is paid off, if it is not properly elevated.

While the state and federal government have a key role in floodplain management, the most critical roles remain at the local level. Local floodplain management programs attempt to:

- Reduce damages associated with flooding.

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- Retain natural functions and values of the floodplain system.
- Balance personal property interests with public safety concerns.

Elements of floodplain management typically include:

- Local land use regulations that restrict development in the floodway and establish construction standards, such as elevation requirements for development in the floodplain.
- Mechanisms to remove flood-prone structures from the floodway portions of floodplains.
- Floodproofing existing structures.
- Public acquisition of floodplains for open space and recreation.

Flood resistant construction standards are incorporated into the State Construction Code and BOCA National Building Code which are enforced in over 80% of Michigan communities. Additional local regulations for floodplain can be integrated into the zoning ordinance, a separate ordinance, or subdivision regulations via performance standards. New structures and existing structures proposed for modification or expansion are often regulated as special land uses and reviewed through the site plan review process. Overlay zoning is commonly used (see Overlay Zoning technique). Flood mitigation measures should also be integrated in stormwater runoff and soil and sedimentation regulations (see associated techniques in this section). In addition to restricting development in the highest hazard portion of floodplains, communities should try to eliminate flood hazards that currently exist by relocation, purchase of conservation easements, land acquisition, and flood-proofing where feasible.

Advantages

- Protects against human injury and property damage associated with flooding.
- Protects unique and diverse riparian habitat.
- Helps retain the natural character of a stream or river system.
- Helps reduce the need for costly flood damage prevention measures (dikes, dams, elevating/reinforcing structures).
- Maintains open space in urban settings.
- Presents opportunities for trails and related recreation development.
- Protects against reduced property values.

Disadvantages

- May be perceived as an infringement on personal property rights.
- Many people may not respect, or be aware of, the damage and injury that can be inflicted by floodwaters; not viewing floodplain regulations as a critical public safety issue.
- The term "100-year flood" seems to connote that the threat of a flood is remote.

Limitations

- Monitoring and enforcement of grading and fill activities may be difficult.
- The 100-year floodplain delineation has its accuracy limitations. Many floodplain maps were revised (borders extended) after Michigan's 1986 floods.
- A community may be "inheriting" flooding problems created upstream from poor management of the floodplain.
- Not all communities in Michigan have floodplain maps available (about 30%).