Why should policymakers care about restoring and protecting floodplains? This is a difficult question for many state legislators because the emphasis in floodplain management usually has been on protecting property owners from potential flood damage through structural projects that keep water out, rather than on limiting development in floodplains and preserving the environmental and property protection values that floodplains possess. There are two policy sides to the issue—hazard management and protection of natural, beneficial functions.1

Focusing on the second set of policies, this report describes legislative options to restore and protect floodplains. The intent is not to suggest that legislators avoid considering measures to protect existing developments in floodplains from hazards. The report instead emphasizes 1) preventive measures to ensure that property is not placed in jeopardy to start with, and 2) consideration of the natural, beneficial functions of floodplains as a means to protect property and the environment. Regulatory and incentive-based legislation are presented in addition to local options, since cities, towns and counties exercise land use management authority. The report is primarily of interest to legislators in the Mississippi River Basin, a region comprised of 10 states stretching north to south from Minnesota to Louisiana. Legislation from the basin states is highlighted to illustrate the options and ensure their relevancy to states within the region.

The report first describes floodplains and their environmental and property protection benefits, then describes policy options in six areas:
1. Public education;
2. Mapping;
3. Land use planning and management;
4. State permits;
5. Land acquisition; and
6. Mitigation.

These options are not mutually exclusive; many are prerequisites for other actions that follow. Public education is critical to informing citizens and policymakers about the benefits derived from healthy floodplains. Mapping is the first step in determining the landscape in which policy decisions will be made and the location of potential hazards to avoid through sound land use policy. Land use planning and management employs a set of tools to balance the use of land with its identified hazards to ensure that prop-
Property is protected and more appropriate land uses are determined for sensitive areas. State permits may be necessary where proposed actions in floodplains have environmental and public safety implications beyond the local jurisdiction. Land acquisition can prevent incompatible activities in floodplains by removing critical lands from development and the potential for property damage. Mitigation provides flexibility in recouping lost benefits where no alternative exists to development in a floodplain by ensuring added protections elsewhere in the watershed.

The report format is similar to that used in the National Conference of State Legislatures’ (NCSL) August 2011 policy brief, Restoring and Protecting Wetlands: State Policy Options,2 which may be viewed as a companion piece, since wetlands and floodplains share many characteristics and benefits.

What Are Floodplains?

Floodplains are lowland areas that border a water body. Often dry and covered with vegetation, they are subject to periodic flooding.3 Iowa statutes define a floodplain as “the area adjoining a river or stream which has been or may be covered by flood water.” (Iowa Code §455B.261)

Floodplain Benefits

Floodplains provide many environmental and property protection benefits. They help to store and release water, control erosion, improve water quality, recharge aquifers, and provide fish and wildlife habitat. Because floodplain policies have focused on reducing flood losses to life and property through projects that channel water away from developments, in the process they may diminish the values that accrue to variable water flow and wetland vegetation associated with floodplains. These structural projects may “confine the waterway or water body to a predefined size and capacity” and turn the floodplain into a “conveyance network to pass the ‘excess’ water as quickly as possible, with no consideration of the loss of ecological function, [or] the potential damage to downstream property owners.”4 The latter point is important to an understanding that floodplains in their natural state can reduce water flows that otherwise would threaten downstream properties by absorbing and spreading out water and by acting as buffers. Table 1 categorizes floodplain benefits by type and value.

Policy Options

Public Education

As noted above, the two broad floodplain policy approaches are hazard management and protection of natural, beneficial functions. The Association of State Floodplain Managers (ASFPM)5 notes that, “although considerable effort has been expended on the first goal (with mixed success), the second has received only minor consideration. Until recently, activities that protected or improved the natural and beneficial uses of floodplains usually were only planned or executed as afterthoughts, or were included in a project only because of a regulatory requirement to mitigate the environmental impacts of another project.”6
Because little emphasis has been placed on protecting the natural, beneficial functions of floodplains, some states are exploring public education programs to raise awareness of these values. Kentucky, for example, requires the state Water Resources Authority to develop a public information program for local governments to use in developing floodplain management strategies. The program is designed to “increase public awareness and community responsiveness toward flood plain management and shall include...model flood plain development ordinances for adoption by local governmental units.” (Ky. Rev. Stat. §151.600) Local ordinances are a logical extension of management authority based on public education and floodplain mapping, as discussed below.

**Mapping**

Local governments are primarily responsible for land use planning and management under authority granted to them by the state. Before they can exercise that authority, however, they need accurate floodplain maps to help guide them not only in locating residential, commercial and industrial developments away from hazard areas, but also in reserving floodplains for more appropriate open space and recreational activities. In addition to “generalized, upfront and area wide maps,” cities, towns and counties may benefit from more detailed “natural and beneficial function information,” especially where they may be issuing a permit to approve a proposed development within a floodplain over which they have regulatory authority.

*Wisconsin* has established a financial assistance program with the Department of Natural Resources that provides grants to local governments to develop “adequate topographical mapping of floodplain and shoreland areas and to delineate floodplain and floodway boundaries, to assist in the establishment and administration of floodplain and shoreland ordinances.” (Wis. Stat. §87.31(1)) The criteria used by the department in awarding local grants include:

a. The adequacy of existing mapping.
b. The existence of an approved floodplain or shoreland zoning ordinance.
c. The status of studies to develop flood profiles for the areas to be mapped.
d. The potential for future development in the areas to be mapped.

### Table 1. Floodplain Benefits

<table>
<thead>
<tr>
<th>Benefit Type</th>
<th>Functions/Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Resources</strong></td>
<td><strong>Natural Flood and Erosion Control</strong></td>
</tr>
<tr>
<td></td>
<td>• Provide flood storage and conveyance</td>
</tr>
<tr>
<td></td>
<td>• Reduce flood velocities</td>
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<tr>
<td></td>
<td>• Reduce flood peaks</td>
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<td></td>
<td>• Reduce sedimentation</td>
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<tr>
<td><strong>Water Quality Maintenance</strong></td>
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<tr>
<td></td>
<td>• Filter nutrients and impurities from run-off</td>
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<tr>
<td></td>
<td>• Process organic wastes</td>
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<tr>
<td></td>
<td>• Moderate temperature fluctuations</td>
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<tr>
<td><strong>Groundwater Recharge</strong></td>
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</tr>
<tr>
<td></td>
<td>• Promote infiltration and aquifer recharge</td>
</tr>
<tr>
<td></td>
<td>• Reduce frequency and duration of low surface flows</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td><strong>Biological Productivity</strong></td>
</tr>
<tr>
<td></td>
<td>• Support high rate of plant growth</td>
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<tr>
<td></td>
<td>• Maintain biodiversity</td>
</tr>
<tr>
<td></td>
<td>• Maintain integrity of ecosystem</td>
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<tr>
<td><strong>Fish and Wildlife Habitats</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide breeding and feeding grounds</td>
</tr>
<tr>
<td></td>
<td>• Create and enhance waterfowl habitat</td>
</tr>
<tr>
<td></td>
<td>• Protect habitats for rare and endangered species</td>
</tr>
<tr>
<td><strong>Societal Resources</strong></td>
<td><strong>Harvest of Wild and Cultivated Products</strong></td>
</tr>
<tr>
<td></td>
<td>• Enhance agricultural lands</td>
</tr>
<tr>
<td></td>
<td>• Provide sites for aquaculture</td>
</tr>
<tr>
<td></td>
<td>• Restore and enhance forest lands</td>
</tr>
<tr>
<td><strong>Recreational Opportunities</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide areas for active and passive uses</td>
</tr>
<tr>
<td></td>
<td>• Provide open space</td>
</tr>
<tr>
<td></td>
<td>• Provide aesthetic pleasure</td>
</tr>
<tr>
<td><strong>Areas for Scientific Study and Outdoor Education</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Contain cultural resources (historic and archeological sites)</td>
</tr>
<tr>
<td></td>
<td>• Provide opportunities for environmental and other studies</td>
</tr>
</tbody>
</table>

e. The potential for flood damage in the areas to be mapped.
f. Applications made by two or more counties, cities or villages which would enable mapping of an entire river system. (Wis. Stat. §87.31(2))

Illinois requires the Department of Natural Resources to define the 100-year floodplain on a township by township basis. The 100-year floodplain represents those lowland areas “that are inundated by a flood that has a 1 percent or greater chance of recurring in any given year or of a flood of a magnitude equaled or exceeded once in 100 years.” (615 ILCS 5/18f) Any construction activity within the 100-year floodplain requires a permit from the department.

Vermont passed comprehensive new floodplain management legislation in 2012 in response to the devastating flooding in the state last year caused by Hurricane Irene. The mapping component requires the secretary of natural resources to provide each municipality with a river corridor map that “shall identify floodplains, river corridor protection areas, flood hazard areas, and other areas or zones indicated on a Federal Emergency Management flood insurance rate map, and shall recommend best management practices, including vegetated buffers, based on site-specific conditions.” (2012 Vt. Acts, Act 138, §10)

Land Use Planning and Management
Most strategies designed to restore and protect floodplains incorporate land use planning and management techniques authorized by state legislation and carried out by local governments. After mapping floodplains and determining flood hazard areas within their jurisdictions, local governments can develop plans to align appropriate land uses with the land’s hazards. This may entail setting aside floodplains for parks, greenways, wildlife refuges and other compatible open space uses, while not placing the built environment in jeopardy. As the ASFPM notes, “by starting the land use planning process with identified hazard areas, appropriate uses can be pre-planned, avoiding the conflicts which otherwise arise when development is already proposed for a permit, and then the issue of flood hazard is discovered.” This allows local governments to not only protect property owners from potential flood damages, but preserve the natural, beneficial functions of the floodplain.

Several advantages are notable with these “non-structural” approaches. “For example, a community allocating floodplain areas to greenways and parks may simultaneously reduce flood losses and provide to the community a wide range of habitat, pollution control, recreational and other functions.” Financial benefits also may exist for a community that has a strong land use management program; it may qualify for reduced National Flood Insurance Program rates under the Federal Emergency Management Agency’s (FEMA) Community Rating System. This latter point is an important way to take advantage of hazard mitigation incentives found in the federal flood insurance program, which “provides discounts on flood insurance premiums in communities which establish additional floodplain management regulations that exceed the minimum criteria set forth in FEMA’s eligibility criteria.”

The National Flood Insurance Program (NFIP) contains four criteria that communities must meet to participate in the program and receive financial benefits; communities may adopt—and are encouraged by the federal government to do so—more stringent requirements.
1. All development in the high-risk (1 percent chance) floodplain must have a permit from the community.

2. Development and human habitation in the floodway is discouraged, although not prohibited. At a minimum, development in the floodway may not cause an increase in flood levels.

3. New buildings may be built in the flood fringe, but they must be protected from damage by the base flood.

4. A “substantially improved” building is treated as a new building in that further construction must meet the NFIP minimum standards for new construction.11

Arkansas grants broad authority to local governments to protect floodplains through land use planning and management policies. It empowers cities, towns or counties to “enact, adopt, and enforce ordinances, building or zoning codes, or other appropriate measures regulating, restricting, or controlling the management and use of land, structures, and other developments in flood-prone areas.” (Ark. Code Ann. §14-268-104(a)) Local measures may:

- Restrict the development and use of land which is exposed to flood damage;
- To the extent possible, guide the development of proposed construction away from locations threatened by flood hazards; and
- Prescribe regulation of the types, purposes, and uses of structures, buildings, developments, or fills permitted to be erected or improved in flood-prone areas. (Ark. Code Ann. §14-268-104(b))

Minnesota emphasizes “non-structural” alternatives to reduce flood damage through local floodplain zoning and other land use management approaches. The state’s policy is “not to prohibit but to guide development of the floodplains… [and] to encourage local governments to adopt, enforce, and administer sound floodplain management ordinances.” (Minn. Stat. §103A.207) Non-structural flood management measures include “public acquisition of floodplain lands… [and] adoption and enforcement of land use control ordinances and building codes. (Minn. Stat. §103F.111)

The emphasis on land use management measures as non-structural policy alternatives in Minnesota requires local governments to adopt ordinances that include:

1. the delineation of floodplains and floodways;
2. the preservation of the capacity of the floodplain to carry and discharge regional floods;
3. the minimization of flood hazards; and
4. the regulation of the use of land in the floodplain. (Minn. Stat. §103F.121)

These ordinances, which must be consistent with local and regional comprehensive plans, must be submitted to the commissioner of natural resources for review and approval before they become effective. If a local government fails to adopt an ordinance, the commissioner is required to adopt one that the local government must implement.

Local ordinances may contain specific tools that can be used to achieve the intended results. Among these are setback requirements that “establish minimum distances that structures or construction work must be positioned (set back) from river channels or shorelines…Setbacks keep buildings from obstructing views, keep on-site sewage disposal systems from polluting public waters, prevent disruption to the channel bank, and can protect riparian habitat.”12

Buffer zones are another local land use management tool that often is adopted in tandem with setback standards. They manage land use activities between a proposed development and the stream in a floodplain. Buffer zones that contain wetland vegetation can “protect the bank from erosion and filter stormwater, cleaning the runoff that enters the water body.”13

As local governments consider land use regulations to restore and protect floodplains, they will want to be aware of how best to balance the public interest in floodplain management with private property rights.
to avoid “regulatory takings.” As noted in *Minnesota’s* state policy, the goal is “not to prohibit but to guide development of floodplains.” Jon Kusler, an attorney with the Association of State Wetland Managers, notes that, “Although courts have broadly upheld floodplain...protection regulations against challenges that they lack reasonable nexus [linkage] to regulatory goals...[they] have required a stronger showing of nexus where regulations have severe economic impact on property owners. They also increasingly require a showing that conditions attached to regulatory permits are ‘roughly proportional’ to the impacts posed by the proposed activity where dedication of lands to public use is involved.”

Kusler suggests that local governments may avoid legal challenges to floodplain regulations if they consider a variety of options to achieve their management objectives. They may:

1. Adopt a no adverse impact floodplain overall performance standard which applies fairly and uniformly to all properties.
2. Include special exception and variance provisions in regulations which allow the regulatory agency to issue a permit where denial will deny a landowner all economic use of his or her entire parcel and the proposed activity will not have nuisance impacts.
3. Adopt large lot zoning for floodplain areas which permits some economic use (e.g., residential use) on the upland portion of each lot.
4. Allow for the transfer of development rights from floodplain to non floodplain parcels.
5. Reduce property taxes and sewer and water levees on regulated floodplains.

**State Permits**

Among all the states in the Mississippi River Basin, *Iowa* has the most comprehensive state authority over floodplains. The Department of Natural Resources is empowered to “establish and enforce rules for the orderly development and wise use of the floodplains of any river or stream within the state and alter, change, or revoke the rules.” The department also may “establish by order encroachment limits, protection methods, and minimum protection levels appropriate to the flooding characteristics of the stream and to reasonable use of the floodplains.” *(Iowa Code §455B.276)* The department, however, must “cooperate with and assist local units of government in the establishment of encroachment limits, floodplain regulations and zoning ordinances relating to floodplain areas within their jurisdiction.” *(Iowa Code §455B.276)* Local regulations require department approval.

*Iowa* statutes also require a permit from the Department of Natural Resources for any proposed structure or fill activity in a floodplain “which will adversely affect the efficiency of or unduly restrict the capacity of the floodway.” *(Iowa Code §455B.275(1))*

In determining whether to issue a permit, the department must assess the effects of an activity on the “efficiency and capacity of the floodway...its effect on flooding of or flood control for any proposed works and adjacent lands...and property, on the wise use and protection of water resources, on the quality of water, on fish, wildlife, and recreational facilities or uses, and..."
Mitigation

Mitigation offers an alternative policy approach when it is impractical to avoid or minimize an adverse effect on a floodplain by a proposed development activity. Dredging or filling a floodplain can diminish the land’s ability to store and retain excess flood water. To compensate for this loss of natural retention, one mitigation option may be to require the developer “to offset new fill put in the floodplain by excavating an additional floodable area to replace the lost flood storage area, preferably at ‘hydrologically equivalent’ sites.” Mitigation may be required at a 1.5:1 acre or 2:1 acre ratio of restored-to-filled floodplain to ensure there is no net loss of comparable natural, beneficial functions. This concept is similar to mitigation formulas applied to wetlands (see NCSL’s policy brief, Restoring and Protecting Wetlands: State Policy Options).

Observations

This report focuses on policy options to restore and protect the natural, beneficial functions of floodplains. This emphasis should not be separated, however, from the other side of the policy issue—hazard management. The reason, as suggested by a Wisconsin legislator who has professional and policy experience in dealing with floodplains, is that hazard management is more compelling. This side of the issue not only directly addresses protection of life and property, but also has significant federal money attached. It is what brings most legislators into the discussion. Hazard management, however, moves the discussion into protecting the natural, beneficial functions of floodplains. The federal funds available to help state and local governments carry conditions designed to break the cycle of responding to flood damage, reconstructing facilities in the floodplain, and repeating damage in the future. To be eligible for federal funds, state and local hazard mitigation plans must develop long-term solutions that include the land use planning, management and acquisition policy options presented in this report. The discussion then shifts to the preventive, non-structural and less costly side of the issue.
Notes

5. As described on its website at www.floods.org, “The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning and recovery.”
6. Association of State Floodplain Managers, 1.
9. Ibid., 2.
10. Ibid., 5.
11. Ibid., 39-40.
12. Ibid., 49.
13. Ibid.
15. Which would prohibit activities that “will flood new areas, increase flood heights, increase erosion or otherwise increase flood and erosion damages to public and private property.” Jon Kusler, “Legal Questions: Government Liability and No Adverse Impact Floodplain Management” (Madison, Wis.: Association of State Floodplain Managers, 2004), 2.
17. Mike Kline, Rivers Program Manager, Vermont Department of Environmental Conservation, personal communication with author, Aug. 16, 2012.
18. Association of State Floodplain Managers, No Adverse Impact, 43-44.

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