



## Planning and Zoning for Water Resources Protection

Introduction Local water resources need to be protected because they are essential for sustaining the quality of life in a community. They are valuable for water supply, sports and recreation, and fish and game habitat. And they make a community a pleasant home.

Land use planning and zoning officials can preserve and protect them by guiding mindful development in their communities.

Watersheds A watershed is an area of land where water from "precipitation" (rain and melting snow) flows over and under the ground to a certain location in a water body, such as a stream, lake, or wetland. All areas of land are in a watershed. Water bodies in a watershed are often connected together. Streams often flow into or out of lakes or wetlands, and smaller streams flow into larger ones.

Environmental Degradation Water flowing through a watershed can pick up and

carry what it contacts into water bodies. And controlling what water is exposed to in its path, controls what gets into them.

Environmental degradation can occur in water bodies as a result of water pollution and excessively fluctuating currents and water levels. Water pollution is the presence of something in water in an amount that diminishes or impairs its value and potential for use as a resource for benefiting humans or for supporting plants, animals and other forms of life. Water pollution can be caused by excessive amounts of natural substances such as eroded soil, manure, and bacteria and/or unnatural substances such as wastes, petroleum products, and agricultural and industrial chemicals. Water pollution accumulates in precipitation that flows over soil, roofs and pavement into water bodies, resulting in "storm water pollution".

In a natural, undisturbed watershed, most of the precipitation soaks into the soil and slowly flows through it into water bodies. This steady flow keeps water levels and currents from changing too much.

When land is developed and paved, precipitation falling on roofs and solid pavement that cannot get into soil flows quickly into water bodies through storm drains. This "storm runoff" rapidly increases water levels and currents. Too

much runoff and not enough groundwater cause too much flow in streams after wet weather and insufficient flow in them following dry weather. Excessive flows in streams erodes banks and scours channels, making them wider and shallower, sometimes too shallow for fish to live in. And extremely high flows can cause destructive flooding.

### Watershed Management

Planning Watershed management planning is a way of involving stakeholders in planning and taking actions together to manage water resources, which involves:

- Developing basic goals for preserving and improving water resources.
- Identifying quantifiable objectives for measuring progress toward achieving them.
- Planning and prioritizing best management practices for meeting the objectives.
- Developing and implementing procedures for evaluating progress and revising the plan, as needed, to ultimately reach the goals.

### Land Use Planning and Zoning

Local planning and zoning officials can play a central role in watershed management planning, because they have knowledge, skills and legal authority needed for implementing watershed plans. And land use planning and zoning can be used to protect

water resources with or without a watershed plan.

Good watershed management includes promoting "smart growth", "low-impact development", and "conservation design" and establishing a "natural features inventory" for identifying and inventorying important natural resources in a watershed.

Good planning and zoning practices in urban and urbanizing areas for managing watersheds involves the following basic strategies:

- Encouraging smart growth to minimize detrimental urban sprawl and the amount of land covered by roofs and solid pavement, especially in areas with new development.
- Encouraging low-impact development, conservation design, and the use of "best management practices" to prevent water pollution and unstable flow in water bodies.
- Identifying and inventorying natural features and environmentally sensitive areas and enacting zoning requirements for protecting them.
- Locating potential pollution sources away from water bodies, groundwater recharge zones, and wellhead protection areas.

Smart Growth Smart growth is a land use planning practice that involves creating more

livable, distinctive communities and conserving open space and natural resources. This is accomplished through promoting compact development and preserving open spaces and agricultural and natural areas in surrounding lands.

Low-Impact Development Low-impact development is a land use planning practice that involves encouraging conservation design and the use of best management practices for preventing environmental degradation caused by urbanization.

Conservation Design Conservation design involves setting aside at least 50% of a parcel for conserving the most significant ecological, scenic and cultural assets and allowing development on the remainder. This practice, which is most applicable in urbanizing areas, can be useful for protecting lakes, streams, floodplains and wetlands, as well as groundwater recharge areas. It can be facilitated by establishing several land development options in a zoning ordinance, with each one promoting resources conservation in a different way. Land developers are offered incentives for practicing conservation by allowing a greater density of development, provided that lots are smaller and grouped together, and by allowing opportunities for substantial savings on the costs of constructing transportation,

water and sewer systems, which are significantly less extensive in cluster developments. Conservation easements can be used for preserving the undeveloped parts of parcels.

Water Flow Balance Reducing the amount of area covered by roofs and solid pavement allows more precipitation to soak into soil. This reduces storm runoff and increases groundwater for feeding and stabilizing flow in water bodies, especially if done throughout a watershed.

High-density development in small areas within a watershed reduces the overall amount of storm runoff going to water bodies in it more than low-density development does. With high-density development, less runoff per developed parcel is generated and less land is disturbed and developed in the watershed.

When an urbanizing area is large and the streams flowing through it are relatively small, water quality begins to diminish in them when the amount of land cover producing storm runoff in the area reaches 10%, and it becomes poor when such land cover reaches as little as 25%. This problem can be minimized by:

- Discouraging growth in rural areas by establishing ordinances that authorize the transfer of development rights from undeveloped

areas to the most highly developed ones, which allows and encourages development at higher densities than are normally allowed in built-out areas.

- Encouraging cluster development through planned unit developments and/or site condominiums to preserve open space.
- Decreasing the length of setbacks from roads required by zoning ordinances, which reduces the length and area of paved driveways and walkways leading to buildings.
- Reducing the size requirements for parking lots and roads required by zoning ordinances.
- Reducing the size and/or number of on-street parking spaces required by zoning ordinances.
- Allowing sidewalks on only one side of roads.
- Minimizing the amount of cul-de-sacs in developments and the amount of pavement in them.

Natural Features Inventory A natural features inventory can be incorporated within a community master plan to identify, inventory and document information about:

- Wetlands, lakes, streams, and aquifers.
- Floodplains, wellhead protection areas, and groundwater recharge zones.

- Areas susceptible to flooding and soil erosion (such as steep hillsides).
- Areas that have threatened or impaired water resources or highly sensitive wildlife habitats.

The master plan and zoning ordinances should include ways for protecting natural features. Overlay zoning can be used for this purpose.

Watershed management plans, or parts of them, can be included in the master plan.

More Information More information about land use planning and zoning for watershed protection is available at the following websites:

- The Center for Watershed Protection (<http://www.cwp.org/>)
- The United States Environmental Protection Agency ([Watersheds | US EPA](#))
- The Michigan Department of Environmental Quality ([http://www.michigan.gov/deq/0,1607,7-135-3313\\_3682\\_3714-118554--00.html](http://www.michigan.gov/deq/0,1607,7-135-3313_3682_3714-118554--00.html))
- Michigan State University Institute of Water Research (<http://www.iwr.msu.edu/>) and Land Policy Institute ([Land Policy Institute - Pages : Planning & Zoning Center at MSU](#))