

Overlay Zoning to Protect Surface Waters

by Joel Russell

The use of zoning to protect water quality represents the “second generation” of water quality regulation in the United States. The original regulatory thrust was the reduction of “point source” pollution, such as direct discharges from factories and sewage treatment plants into waterways. These discharges were responsible for the appalling condition of most American rivers and lakes in the first half of the 20th Century.

As the Clean Water Act brought point source discharges under control in the 1970s and '80s, the worst pollution was cleaned up. Attention has increasingly turned to the problem of “non-point source” pollution, primarily stormwater run-off from surfaces such as roofs, parking lots, roads, farm fields, and lawns. Because non-point pollution comes from almost everywhere, it cannot be regulated in the same way as point sources, which have a limited number of defined places where the pollutants originate.

Regulating land use practices near streams can significantly reduce the run-off of sediment and other pollutants into water bodies. But conventional zoning, which divides a jurisdiction into zoning districts and establishes use and dimensional regulations for each district, can actually contribute to the problem of non-point pollution by ignoring the impacts of nearby development. For example, if a lot has a stream running through the rear yard, a large minimum front setback (required under the zoning district regulations) might force a building to be located very close to that stream, resulting in possible degradation to its water quality.

By creating a system of “overlay zones” that cross conventional zoning district boundaries and protect stream corridors, lakeshores, and watersheds, it is possible to maintain and improve the water quality -- even as the community becomes more developed.

A water protection overlay zone is a special kind of zoning district designed to protect a stream corridor, lake, or watershed.¹ It “overlays” existing zoning districts and adds additional requirements to the underlying district zoning, which remains in effect except to the extent the overlay zone provisions specifically modify it.

An overlay zone protects water quality by setting additional standards for development *and* by incorporating site-specific review procedures.

Developing an Overlay Zone

¹ Overlay zoning is a technique used in a variety of ways, not just for protection of natural resources such as lakes and streams. For example, overlay zones can be designed to better protect historic structures or improve roadway corridors. For an overview of overlay zoning, see “Making Use of Overlay Zones,” by Elizabeth A. Garvin, Esq., in PCJ #43 (Summer 2001). Also note that in some Western states, the term “combining districts” is used instead of “overlay zones.”

1. Boundaries

An essential first step in developing an overlay zone is to map the zone's boundaries. In the case of stream corridors or lakeshores, these boundaries are typically determined by drawing a boundary line a specified horizontal distance from the bank or shore of the stream or lake (usually between 100 and 200 feet).

In the case of the watershed of a lake or reservoir, an overlay zone boundary is usually the actually physical boundary of the watershed. Establishing the location of such a boundary requires study of topographic maps. A field investigation by an engineer or a hydrologist may be needed to establish an exact boundary location for specific sites.

Note that delineating an overlay zone boundary is not the same thing as establishing a setback or buffer (which will be discussed shortly). While this can be a confusing distinction, the difference is simply that the overlay zone is the broader geographic area *within which* standards such as setbacks and buffers apply.

2. Standards

There are a variety of types of development standards that communities use in stream corridor or lakeshore overlay zones. The purpose of these standards is to reduce or mitigate adverse impacts that development might otherwise have on the water body. Among the most common standards:

- *Limitations on impervious surface coverage.* One of the main factors affecting water quality is the total percentage of land covered with impervious surfaces such as buildings, pavement, and highly compacted soil. Overlay zones may set a lower level of allowable impervious surface coverage than would otherwise be allowed in the underlying zoning district. For example, an overlay zone might provide for a maximum of 10 percent impervious coverage, compared to 40 percent in the underlying zoning district (if that district regulates impervious surface coverage at all).² Again, the overlay district's stricter limits would control.
- *Setbacks.* Setbacks establish a required minimum distance between buildings and the stream or lakeshore. Setbacks may vary for different types of structures. For example, overlay standards would likely require greater setbacks for houses than for small accessory structures such as gazebos. Structures such as boathouses and docks, which by their very nature need to be located along the stream or lake, will obviously not have any required setbacks.
- *Buffers.* Buffers are like setbacks, except that they not only limit building but also restrict other land use practices within a specified distance of the water's edge. Such

² Numerous studies have shown that once the area of an entire watershed has over 10 percent impervious surface coverage, water quality begins to decline. It is possible to have higher percentages of impervious surface coverage if measures are taken to filter the stormwater, but in relatively undeveloped areas maintaining a low impervious surface coverage ratio is the most effective tool.

practices may include tree-cutting, mowing, grading, excavation, the use of fertilizer and pesticides, and paving. Buffer regulations may also require beneficial land use practices such as the maintenance of natural vegetation. Within buffer areas, some of these land use practices may only be allowed with prior review and mitigation of potential impacts.

- *Restrictions on the use of hazardous materials.* This applies mostly to industrial types of uses, but there are also materials used commonly in the household, such as cleansers, solvents, fertilizer, gasoline, and oil, that should be kept away from water bodies.
- *Septic system regulations.* Septic systems situated close to water bodies are often unseen sources of serious water pollution. Depending upon soil conditions and the density of development, even failing septic systems that are some distance from the water's edge can have adverse effects. While all septic systems are regulated under health codes, sometimes an overlay zone will establish greater setbacks or more stringent design requirements than would otherwise apply.
- *Erosion control.* Within overlay zones it is especially important to have high standards for erosion control to ensure that land disturbance does not result in erosion and sedimentation of water bodies.
- *General standards.* Sometimes there is a general requirement that an applicant for a land use within an overlay zone must show that the proposed use will not adversely affect the water quality of a protected stream or lake. This requires the submission of plans under a review procedure as described below.

Watershed overlays typically incorporate stream corridor overlays, but also contain regulations that affect the entire watershed. These often include limitations on impervious surface coverage; clear-cutting of trees; and large-scale land disturbance such as excavation, grading, and construction. Such overlay zones may also require low density zoning throughout the watershed; mandatory clustering of development; and the use of public sewer infrastructure to minimize septic discharges.

Watershed overlays designed to protect public drinking water supplies will likely contain more stringent standards. The construction of water and sewer infrastructure within public water supply watersheds can be controversial. While sewer systems are generally better for water quality than septic systems, some communities' watershed overlay regulations ban sewers. The reasoning is that having sewers will lead to higher density development which, in turn, will generate more run-off. However, this outcome can be avoided if the underlying zoning sets a low overall density, while requiring clustered development that protects surface waters with large open space buffers.

3. Review Procedures

While some overlay zone standards, such as setbacks, are relatively straightforward to administer, other standards may necessitate a site-specific review and analysis. In many communities, the existing zoning ordinance will already require subdivision or site plan

review for large-scale residential developments and most kinds of commercial development. In such instances, consideration of the overlay zone standards can be incorporated into the existing review process.

However, smaller-scale development, such as building a house on an existing lot, will typically require only a building permit. If overlay zoning standards are adopted, it may be necessary to include provision for a streamlined form of site plan review for small projects. This can be administered by a municipal board or commission (such as the planning commission), or by a zoning administrator or building inspector. Some activities regulated within the overlay zone (such as clearing of vegetation or the use of fertilizer) will not normally require any special review. Violations brought to the attention of the zoning administrator or building inspector will typically result in fines and/or corrective measures.

Non-Zoning Approaches

It is worth noting that there are a number of non-zoning approaches that can also be important to achieving a community's water quality protection objectives. These include:

- *Public education.* To deal with those practices that are especially hard to regulate, such as the use of pesticides, herbicides, and hazardous substances near waterways, public education campaigns by municipalities and watershed associations have often been effective.
- *State river and lake protection legislation.* Many states have adopted forms of river and lake protection regulatory programs that function in much the same way as overlay zones, requiring setbacks, buffers, and regulated areas near water bodies.
- *Installation of water protection infrastructure.* This may include upgrading existing sewage treatment plants, building new plants, and providing subsidies to upgrade individual septic systems.
- *Water supply watershed protection regulations.* In many states, providers of public water have regulatory powers outside of their jurisdictional boundaries to protect water quality in their reservoirs. For example, New York City is able to regulate land uses within the watersheds of its reservoirs in the Catskill Mountains under authority given to it through the state health department.
- *Acquisition of riparian and watershed land.* The acquisition of land by public agencies or non-profit land trusts for conservation purposes is perhaps the surest way to ensure water quality protection. However, land acquisition can be quite costly.
- *Wetlands regulation.* The regulation of wetlands at the federal, state, and local level has done a great deal to protect water quality and will continue to do so.

- *Development patterns.* The importance of the overall pattern of development in a community should not be ignored. Development that takes a “smart growth” or “new urbanist” form can result in much lower impervious surface coverage and greater setbacks from waterways. This enables the community to protect its water resources by virtue of its overall development pattern, rather than just by site-specific regulations.

Summing Up:

Overlay zones can be a highly effective tool in local efforts to protect water quality. Used in combination with other planning and zoning tools, overlay zones can preserve and maintain a priceless environmental resource that is vital to health, quality of life, and economic well-being.³

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- “How Dimensional Standards Shape Residential Streets,” *PCJ #50*; <www.plannersweb.com/wfiles/w312.html>.
- “Land Trusts and Planning Commissions: Forging Strategic Alliances,” *PCJ #34*; <www.plannersweb.com/wfiles/w351.html>.
- “Diagnosing Your Community Before You Plan,” *PCJ #26*; <www.plannersweb.com/articles/rus120.html>.
- “Rethinking Conventional Zoning,” *PCJ #15*; <www.plannersweb.com/wfiles/w554.html>.

photo captions:

1. You should have a photo of Joel Russell from his last article.
2. On photo CD, use 006 or 007. caption: Dover, New York, has adopted a stream corridor overlay to protect the Swamp River. credit: J. Russell.
3. On photo CD, use 001 or 002 if the quality is adequate. caption: A zoning overlay can provide a buffer between the river and residential development, as along the Ten-Mile River, also in Dover, New York. credit: J. Russell.

Sidebar:

Wetlands and Aquifer Protection

³ Stream corridors, in addition to protecting water quality, can also offer other benefits including minimizing property damage from floods, preserving wildlife corridors, and providing areas for hiking and bicycle trails.

The protection of water quality requires attention not only to surface water bodies (the focus of this article), but also to wetlands and groundwater.

Wetlands Protection. The importance of wetlands has been recognized since the 1970s when Congress and most state legislatures passed laws to protect them. Federal wetland protections are administered through the Army Corps of Engineers under Section 404 of the Clean Water Act. For larger projects, this can require obtaining a permit from the Corps. Smaller projects falling below designated thresholds typically do not require an individual permit. State level regulation of wetlands varies greatly. Some states regulate wetlands through state agencies, while others delegate this function to local governments.

Aquifer (Groundwater) Protection. In communities that rely on an aquifer for potable water, it is essential to protect the groundwater from contamination. Overlay zones identify the surface area that can affect underground water within the aquifer.

With the exception of “sole-source aquifers,” which enjoy federal and state protection, aquifer protection is primarily a matter of local regulation, usually through overlay zoning. Unlike wetlands and surface waters, which can be studied by direct inspection, groundwater is not visible. Aquifer studies therefore require inferences based upon the results of well tests, mapping of surface watersheds, and studies of soils and geology.

Aquifer protection overlays typically prohibit certain uses which employ chemicals or hazardous materials (such as gas stations, dry cleaning establishments, and car washes), and also usually prohibit underground storage of fuel oil. Other uses often barred in aquifer overlay zones (or allowed only as conditionally permitted uses) include waste disposal, animal feedlots, and storage of road salt. Aquifer overlays may also cover other issues such as residential density and impervious surface coverage.

Sidebar:

Look to the Plan

Local zoning, whether for the protection of water quality or for other purposes, should be based on a sound planning rationale. The best way to do this is through the community’s comprehensive plan (sometimes known as the general plan or master plan). Local or regional plans can address water quality issues by:

- Mapping and describing streams, ponds, lakes, reservoirs, and aquifers.
- Establishing community goals for the protection, use, and enhancement of water resources, sometimes differentiating among various kinds of water resources (e.g. a stream running through a town center vs. a recreational lake vs. a drinking water supply).
- Recommending implementation strategies, which may include a range of actions such as development of overlay zones, public land acquisition, or health regulations on septic systems.

The more clearly the community frames its goals, and supports those goals with sound information, the more legally defensible will be the implementation tools, provided that they are tailored to accomplishing the goals and based on the available information. There are two caveats: First, while water resources protection can be used to regulate and control growth, it should not be used as an excuse to stop growth. Second, the water resource goals and implementation tools should be coordinated and balanced with other community objectives, such as affordable housing and economic development, so that the plan does not result in conflicting recommendations.

Sidebar:

Committee Work

by Bryan Stumpf

Using a broad-based committee when drafting an overlay zone has many benefits. A diverse committee of stakeholders can work through contentious issues, create standards that are acceptable to the community, and set the foundation for easier administration of the ordinance. This is what happened when Monroe County, Indiana, developed an overlay for Lake Monroe (the largest lake in the state).

Lake Monroe is valued for its scenic beauty and is an important recreation and tourism destination. Equally important, it is the primary source of drinking water for the county. The lake has also been subject to increasing development pressure.

In seeking to implement the county's comprehensive plan policies to better protect the lake, the County Commissioners established a special committee to develop a zoning overlay district. The committee included developers, environmentalists, natural resource professors, attorneys, utility representatives, and engineers. Over a five month period, sometimes with impassioned discussions, the committee prepared a draft ordinance. The County Commissioners adopted the committee's recommendations with only minor changes.

The overlay divided the Lake Monroe watershed into four areas based upon distance from the edge of the lake or its main tributaries and the availability of public sewer and water services. Each of the areas contained development standards that regulated the maximum slope that could be disturbed; limited density; established where natural vegetation must be protected; and set standards for the placement of houses on lots.

Despite this level of complexity (with varying standards for the four areas within the overlay), the ordinance has been relatively easy to administer. Much of the credit for this goes to the work of the committee. They anticipated potential problems that could make administration of the overlay difficult, and ensured that the intent and wording of the overlay were clear.

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... More on Building Support

Environmental overlays not only need to be based on good science, they also have to have community support. Building this support should be an integral part of any process to develop an overlay zone. This includes public education and building consensus for the ordinance. It also means making sure landowner concerns are addressed. We had to hire an environmental technician to walk up all the streams one summer with a GPS unit because, perhaps not surprisingly, we couldn't get past people arguing the streams weren't exactly where the old maps showed. After that there wasn't any stalling of the process due to disputes over base information data.

Ilene Watson is a planner with the Regional District of Central Okanagan in Kelowna, British Columbia, and also a member of the PCJ's Editorial Advisory Board.

Sidebar:

The Land of 10,000 Lakes

by Jean Coleman

Minnesotans love their lakes. This is proven by the fact that the only state-wide zoning requirement in Minnesota is that communities must adopt shoreland management overlay districts for lakes and rivers. In response to water quality concerns, the Minnesota Shoreland Management statute became effective statewide in 1970. At least 250 local governments have adopted shoreland ordinances, including 85 of the state's 87 counties.

Based on a lake and river classification system, local ordinances are required to adopt minimum standards and best management practices for shoreland development that include:

- Minimum lot sizes and width at shoreline
- Restrictions on types of uses
- Structure and septic setbacks from shorelines and bluffs
- Limits on impervious surfaces
- Stormwater management requirements
- Restrictions of the removal of vegetation to minimize runoff but also to minimize visual impacts of development for lake users

Many local governments exceed the minimum requirements with provisions such as:

- Larger minimum lot sizes

- Requirements for shoreline restoration
- Bans on phosphorus lawn fertilizer
- Septic upgrade requirements
- Low-impact design requirements for stormwater management and erosion control

The Minnesota Department of Natural Resources and the Minnesota Erosion Control Association continue to promote education for local government officials on the connection between land use and water quality through Northland NEMO (Non-point Education for Municipal Officials). Northland NEMO recently annotated the Minnesota state shoreland sample ordinance with suggestions for additional water quality protection provisions: <www.mnerosion.org/nemo.html>.

Jean Coleman is an attorney and land use planner with CR Planning, Inc., in Minneapolis. For more on the National NEMO program, see page ___ of this issue.