STONY BROOK-MILLSTONE WATERSHED ASSOCIATION

STREAM CORRIDOR ORDINANCE IMPLEMENTATION PACKAGE

MAY 2002

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INTRODUCTION

Local governments have a significant role in directing New Jersey's future in environmental issues. The protection and health of a watershed relies a great deal on the land use laws and policies that our municipalities enact. In the past, the Stony Brook-Millstone Watershed Association (the Association) has had requests from various municipalities for assistance with drafting ordinances, improving zoning and increasing local environmental quality. In addition to responding to these requests, the Association wants to provide a more comprehensive ordinance analysis for local municipalities. Thus, we are developing a series of ordinance implementation packages to assist municipalities in their efforts to protect, preserve and enhance their local communities as well as the watershed. These implementation packages can aid municipalities in their development of proactive measures that preserve natural resources and establish the necessary regulatory structure. This Stream Corridor Ordinance (SCO) Implementation Package is the first in this series.

Maintaining the natural system of streams has many benefits for a community, the surrounding communities and the regional watershed. If stream corridors are maintained in their natural condition, with minimum disturbance, then they are instrumental in performing the following functions:

- Adding to the natural character and providing viewsheds within the community
- Preventing flood related damage to surrounding communities;
- Removing sediment, nutrients, and pollutants;
- Reducing stream bank erosion;
- Providing shade that maintains cooler water temperatures;
- Maintaining biological diversity;
- Helping maintain adequate flows of filtered water to underground aquifers; and
- Providing greenway corridors for wildlife.

Streams flow from one municipality to the next, carrying sediment and pollutions in their course. Thus, protection of our watersheds must be a concerted effort among all our municipalities. Everyone pays the price for pollution and flooding in our streams – the high cost of treating and purifying water for drinking; the lack of recreational opportunities (fishing, swimming and canoeing); and the staggering cost of flood damage. Enacting a stream corridor ordinance in your municipality is a proactive and positive step toward improving water quality and helping make a difference regionally.

This package includes tools and techniques that arm local planning boards with key information necessary when introducing this protective and proactive ordinance. Provided in the sections that follow are the scientific rationale for stream corridor protection, clarification of a municipality's authority for implementing a SCO, specific elements that make up an effective SCO, and an analysis of existing and model SCOs that can provide a basis when developing a SCO in your municipality.

Please note that any municipality interested in enacting this kind of land conservation tool is advised to seek competent legal counsel to review in more detail the information and ordinances presented herein.

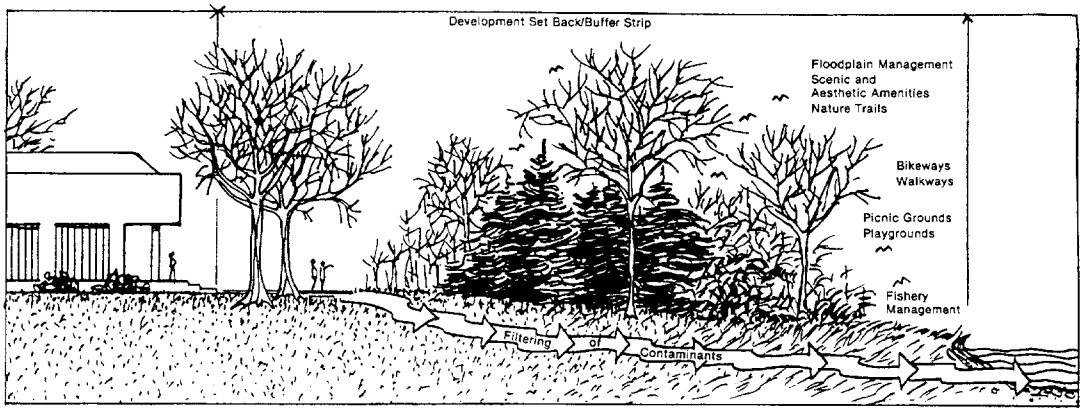
BACKGROUND

I. Why Protect Stream Corridors?

In a society dependent on water for drinking, agriculture and industrial processes, streams provide the lifeblood for our well-being. It was once thought that water could be best controlled by channelizing it and distributing it after sending it to a treatment plant. According to Dave Rosgen, author of *Applied River Morphology*, when the works of man run contrary to the natural, stable tendencies of the river, the river eventually dominates.[1] The best way to stabilize a stream and protect water quality is to preserve the stream's surrounding ecosystem.

A stream corridor is composed of several essential elements including the stream channel itself, associated wetlands, flood plains and forests (see Figure 1). Where stream corridors are maintained in their natural condition with minimum disturbance they are instrumental in performing the following functions:

- Removing sediment, nutrients, and pollutants by providing opportunities for filtration, absorption and decomposition by slowing stormwater velocity, which aids in allowing stormwater to be absorbed in the soil and taken up by vegetation
- Reducing stream bank erosion
- Displacing potential sources of non-point source pollution from the water's edge
- Shading surface waters to prevent excess warming
- Maintaining biotic diversity of aquatic plants and wildlife
- Preventing flood-related damage and associated costs to surrounding communities
- Helping to maintain adequate flows of filtered water to underground aquifers
- Providing greenway corridors for wildlife



Suburban Stream Corridor

Source: *Stream Corridor Management, A Basic Reference Manual.* New York State Department of Environmental Conservation, Albany, New York 12233. 1985.

Figure 1: What a stream corridor should look like in a suburban setting.

[1] Dave Rosgen, *Applied River Morphology* 3 (1996).

II. Scientific Rationale For Stream Corridor Protection

The benefits of protecting stream corridors are well documented. A review of the technical literature is presented in *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation*,[2] which gives extensive scientific support for establishing and maintaining corridors along streams. Simply put, stream corridors protect the water quality of streams.

The majority of sediment and pollutants entering local streams occur during storm events. A vegetated buffer of 100' outside the 100-year floodplain, as recommended in the Association model ordinance, provides protection and nutrient removal during such high flow events. Vegetation along stream corridors traps and stores those nutrients that degrade water quality. An overabundance of nutrients, such as phosphorus or nitrates, act as a fertilizer causing aquatic plants to undergo rapid population growth called an "algal bloom." When the algae die and sink to the bottom of the stream, oxygen is consumed during their decomposition by naturally occurring bacteria. Aquatic life needs oxygen to survive and can be severely stressed, fail to reproduce, or die if oxygen levels are low for a long period of time.

The roots of plants in a stream corridor also hold onto the soil, preventing erosion. Vegetation along the stream also traps sediment washed towards local water bodies during storm events. Sediment in a stream can reduce the transmittance of light and turn a stream the color of the surrounding soil. The damage to the stream is not merely aesthetic. Streams laden with sediment are inhospitable for fish because the sediment becomes trapped in their gills and impedes uptake of oxygen.

According to the 2000 New Jersey State Water Quality Inventory, approximately 65% of New Jersey Department of Environmental Protection's macroinvertebrate monitoring sites are moderately impaired. Suspected causes of impairment include:

- Stormwater and runoff from land uses such as agriculture and urban and suburban development containing sediment, nutrients, pesticides and other toxics.
- Adequate stream flow (water consumption, inter-basin transfer of water and wastewater, drought and flooding).
- Habitat destruction, including erosion.

Trees and vegetation within a stream corridor aid in keeping water temperatures low. Studies show that streams with no shading vegetation have higher water temperatures, which may be linked to levels of oxygen solubility so low that fish cannot survive.[3] Decaying trees become debris in stream, providing essential habitat for many fish, especially salmonids (salmon, trout, and related fish). As floating debris, their bark acts like a sponge to soak up pollutants.

Stream corridors provide contiguous migrating corridors that can maintain the biotic diversity of native plant and animal populations. This is important especially in urban areas where streams and associated forests are often the only suitable habitat areas remaining after

[2] Seth Wenger, *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation* (Institute of Ecology, University of Georgia 1999).
[3] Seth Wenger, *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation* (1999).

urbanization. Vegetation within these corridors also provides dissolved and particulate organic food needed to maintain high biological productivity and diversity in the adjoining stream.[4] A large percentage of New Jersey's endangered species rely on stream corridors and associated wetlands for survival.

[4]United States Department of Agriculture, "Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources (1991).

AUTHORITY

Under New Jersey state law and the New Jersey State Constitution, municipal governments have broad police powers (the power to legislate in the common good) to protect local citizens. Municipalities also play a key role in our efforts to protect regional watersheds. Watersheds provide critical natural services that sustain or enrich our daily lives – supply of drinking water, critical habitat for plants and animals, areas of natural beauty, water bodies for recreation and relaxation, and groundwater recharge areas, to name a few. Communities around the nation are turning to watershed protection to sustain the important ecological and community values that they stand to lose as they grow and develop without thoughtful or proactive planning. Regional cooperation is key to successful watershed protection.

This section outlines the legal authority a municipality has to enact a SCO. It is important to reach out to surrounding municipalities and to the county to ensure that the first steps in regional cooperation are begun. The Association is one key resource in helping and coordinating a dialogue to ensure watershed protection.

A. Flood Hazard Area Control Act

State support for stream corridor protection is found in the *Flood Hazard Area Control Act* (N.J.S. 58:16A-50 et seq.), which creates state standards for identifying flood hazard areas and controlling flooding in these areas. The Act, implemented by the *Flood Hazard Area Regulations* (N.J.A.C. 7:13-1 et seq.), gives the New Jersey Department of Environmental Protection (NJDEP) exclusive jurisdiction to establish minimum standards for the adoption of local rules and regulations concerning the development and use of land within the flood fringe area. Stream Corridor ordinances supplement, and can help to satisfy, requirements of this Act. While exclusive jurisdiction is granted to the DEP to regulate these areas, municipalities may adopt more restrictive standards. The Act provides that within 12 months after the delineation of any flood hazard area, a municipality must adopt regulations concerning the development and use of land in the flood fringe area that at least conform with NJDEP standards (N.J.S. 58:16A-57). In addition, municipalities are allowed to adopt more restrictive requirements than the NJDEP for areas designated as floodways and flood plains (N.J.S. 58:16A-62).

The *Flood Hazard Area Control Act* does not apply to lands regulated by specific regulations or acts, such as most development in the review zone established by the Delaware and Raritan Canal Commission (N.J.A.C. 7:45-1 et seq.) or lands regulated pursuant to the *Waterfront and Harbor Facilities Act* (N.J.S. 12:5-1 et seq.), the *Wetlands Act of 1970* (N.J.S. 13:9A-1 et seq.), or the *Coastal Area Facility Review Act* (CAFRA, N.J.S. 13:19-1 et seq.).

B. Freshwater Wetlands Protection Act

The *Freshwater Wetlands Protection Act* (N.J.S. 13:9B-1 et seq.), implemented by the *Freshwater Wetlands Protection Regulations* (N.J.A.C. 7:7A-1 et seq.), regulates almost all activities in freshwater wetlands and transition areas and seeks to promote the state's goal of preserving the purity and integrity of freshwater wetlands from random, unnecessary or undesirable alteration or disturbance. The Act does preempt municipal

and county regulation of wetlands and transition areas, however, case law indicates that more restrictive local controls may be upheld. See *Crow-New Jersey 32 Ltd. v. Township of Clinton*, 718 Fed. Supp. 378 (D. N.J. 1989). It appears that the Act does not preempt or supercede laws that have a tangential or ancillary effect upon wetlands and transition areas and were predicated on different concerns, such as stream corridor ordinances. See *N.J. Chapter of NAIOP v. Dept.*, 241 N.J. Super. 145 (App. Div.), certif. den. 122 N.J. 374 (1990) and *Matter of Waterfront Development*, 257 N.J. Super. 524 (App. Div. 1992). Note that lands within the jurisdiction of the Hackensack Meadowlands Development Commission and the Pinelands Commission are exempt from the Act.

C. Delaware and Raritan Canal Commission

At the regional level, the Delaware and Raritan Canal Commission has jurisdiction to review governmental and private projects within its "Review Zone" that have the potential to cause an adverse impact on the Delaware and Raritan Canal State Park (N.J.A.C. 7:45-1 et seq.). All major projects that fall within designated sections of the "Review Zone" are subject to review by the Commission for stream corridor preservation. The rule defines the stream corridor to include all the land on either side of the stream within the 100-year flood plain, plus a 100-foot wide buffer along the 100-year flood plain. This definition applies to streams designated in the rule plus all tributaries of the Millstone River. When the Commission determines that a municipality or county has adopted a stream corridor ordinance that is more stringent than the rule, then compliance with the stricter requirements in the local ordinance shall be required as a condition of the Commission's approval for the project. The provisions of the rule are meant as a minimum, not a maximum for stream corridor protection (N.J.A.C. 7:45-6.7).

D. New Jersey Municipal Land Use Law

The enabling statutes specifically written to govern zoning ordinances are found in the New Jersey Municipal Land Use Law (MLUL). The stated purpose of this law is to encourage municipal action to guide the appropriate use or development of all lands in this state. Protection of water quality is an essential aspect of the intent and purposes of the *New Jersey Municipal Land Use Law* (MLUL C. 40:55D-1, et seq.), which is the legal foundation for the municipal planning and zoning process. Included in the intent and purposes of the MLUL are the following:

- Secure safety from fire, flood, panic and other natural and manmade disasters. (MLUL C. 40:55D-2b.)
- Provide adequate light, air and open space. (MLUL C. 40:55D-2c.)
- Ensure that the development of individual municipalities does not conflict with the development and general welfare of neighboring municipalities, the county and the State as a whole. (MLUL C. 40:55D-2d.)
- Promote the conservation of historic sites and districts, open space, energy resources and valuable natural resources in the State and to prevent urban sprawl and degradation of the environment through the improper use of land. (MLUL C. 40: 55D-2j.)

For an ordinance to be valid it must be consistent with state laws and policies, with the purposes of the MLUL, and it must promote the public health, safety, morals and general welfare. Stream corridor ordinances fulfill these conditions. Specifically, zoning ordinances and master plans may contain the following environmentally relevant powers:

- Designate and regulate areas subject to flooding. (MLUL C. 40:55D-65e.)
- To prevent, to the greatest extent feasible, an increase in non-point pollution, to maintain the integrity of stream channels for their biological functions, as well as drainage. (MLUL C. 40:55D-95)
- A utility service plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waster treatment, solid waste disposal and provision for other related utilities, and including any storm water management plan (MLUL C.40:55D-28b(5))

New Jersey case law makes it clear that zoning ordinances are presumed valid, unless that presumption is overcome by showing that the zoning ordinance is "clearly arbitrary, capricious or unreasonable, or plainly contrary to the fundamental principles of zoning or the [zoning] statute." *Riggs v. Township of Long Beach*, 109 N.J. 601, 610-611 (1988). Having this understanding will assist in developing a strong ordinance that should withstand challenge. There are two ways to keep an ordinance from being challenged. The first way is to ensure that the use in question is consistent with the master plan. The second is to build a "record" that demonstrates both the need for the ordinance and the thoughtfulness used in its design. Inclusion of a conservation plan element in the master plan that calls for the protection of the water supply, wetlands, rivers and other waters will establish a reasoned basis for the passage of a stream corridor ordinance. This principle applies to a municipality's authority to pass land use ordinances designed to protect the environment. Discussion of the two cases below helps demonstrate this principle.

In *Kirby v. Township Committee of Bedminster*, 341 N.J. Super. 276 (2000), a zoning ordinance was passed in part to preserve the environmental health of the municipality. The municipality rezoned a portion of the township from an R-3 Rural Residential Zone, which permitted one residence for every three acres, to an R-10 Rural Residential Zone, which permits one residence for every ten acres. The planning board determined that lower density would serve a number of resource protection objectives. The Township Committee also consulted the State Planning Commission (SPC) for its opinion on the rezoning. The SPC found that both Bedminster's Master Plan and the rezoning provisions were consistent with the State Development and Redevelopment Plan. The trial judge found the steps taken by the Township demonstrated "an orderly consideration of all the relevant material, consultation with experts, dialogue with Somerset and New Jersey planning officials, and solicitation of public input – all leading to the enactment of the R-10 zone." *Kirby* at 287. Like many zoning cases, *Kirby* demonstrates that a thorough record of the reasons for the zoning will make any ordinance more likely to withstand a challenge in court.

In *Dock Watch Hollow Quarry Pit v. Township of Warren*, 142 N.J. Super. 103 (1976), an ordinance regulating the operation of quarries within the Township was challenged. The

quarry in question had been operating at the time the Township passed the ordinance and was declared a nonconforming use and allowed to continue operation. The owners of the quarry argued that because the quarry was already found to be a nonconforming use it was immune from any future zoning restrictions. The court rejected this argument, stating that "[n]onconforming uses are clearly subject to such police power regulations, including those designed for the preservation of the environment and the protection of ecological values." *Dock Watch* at 117. Thus, a municipality's discretion to exercise its police power to protect the public health and welfare of its residents is likely to be recognized by a court and that environmentally related ordinances could be found valid on these grounds.

E. State Development and Redevelopment Plan

Stream corridor protection has significant support in *State Development and Redevelopment Plan* (SDRP, March 2001). The SDRP calls for the protection of stream and wetland systems through the use of coordinated planning efforts aimed at reducing sources of pollution and other adverse affects of development (Statewide Policy #11). The plan also identifies statewide policies such as protecting the natural function and quality of surface water in streams by establishing and maintaining vegetated buffers, along with identification and delineation of sensitive surface water resource systems to protect from negative impacts to flow and quality (Statewide Policy #12). The following specific policies within the statewide policy support municipalities' adoption of stream corridor ordinances:

- Policy #8 Non-Point Source Pollution - Reduce and where feasible eliminate the volume of toxicity of pollution in surface and ground water from non-point sources.
- Policy #17 Identification and Delineation of Surface Water Systems – Identify and delineate headwaters, reservoirs and other sensitive surface water resource systems and manage activities in areas containing, or adjacent to, these systems to protect them from immediate or cumulative negative impacts to flow and quality.
- Policy #18 Buffer Areas - Establish and maintain appropriately vegetated buffers along streams, rivers, wetlands, reservoirs and scenic waterways to protect the natural functions and quality of surface water resources.
- Policy #19 Site Disturbance – Site disturbance should be minimized to prevent or reduce soil erosion, sedimentation, compaction and loss of native vegetation.
- Policy #26 Flood Plain Development and Redevelopment – Protect and enhance wetlands and avoid development and redevelopment in designated flood plains.

Reliance on the State Development and Redevelopment Plan to redesign land use regulations was upheld in *Mt. Olive Complex v. Township of Mt. Olive*, 340 N.J. Super. 511 (App. Div. 2001). The court stated that while "the State Planning Act as presently structured does not require ordinances to be consistent with the State Plan, its very terms stress the importance of voluntary compliance." The court concluded that the rezoning of a portion of the

township from Planned Unit Development to RA-1, which allowed clustering on two-acre lots, and then finally to RR-AA, which permitted one residence for every five acres "was consistent with the standards and goals of the State Plan" (*Id.* at 545) and held that the trial court had erred in declaring the rezoning invalid. The court also noted the requirement by MLUL that master plans "shall include a specific policy statement 'indicating the relationship of the proposed development of the municipality as developed in the master plan to…the State Development and Redevelopment Plan.'" (*Id.* at 544 and see MLUL C. 40:55D-28d.)

ORDINANCE STRUCTURE AND ORGANIZATION

There are a number of ways to structure a stream corridor ordinance and the approach taken by a municipality should reflect the amount of control it wishes to retain over the corridor. While most ordinances simply establish a stream corridor and seek to regulate activities taking place within them, some municipalities require the landowner to grant a conservation easement to the town in perpetuity.[5] For example, South Brunswick's stream corridor ordinance requires a conservation easement of 50 feet from the stream bank or 50 feet from the 100-year floodplain, whichever is greater, plus the first 25 feet of any critical slope, as defined by the ordinance as land having a slope of 12% or greater. Holmdel requires that a conservation easement be included in any application to the Planning Board. The conservation easement makes subsequent construction activities in the buffer covered by the easement more difficult. However, nearly all the ordinances use the same basic structure and include a purpose or intent section, definitions, an applicability section, a standards section, a list of prohibited and permitted uses, variance requirements, notice requirements, and enforcement procedures.

The Purpose Section states the municipality's intentions for enacting a stream corridor ordinance. Purposes include any combination of the following: protecting property from flooding, protecting stream water quality, protecting natural habitats, and providing recreation corridors. Some ordinances go further by declaring their intent to slow or contain urban sprawl and others note the effect on down stream users or others living in the watershed when development occurs in stream corridors.

The Definition Section lists key terms used throughout the ordinance. Most important is how the ordinance defines "stream." This often requires reference to United States Geological Survey Hydrologic Maps. Whether the definition refers only to perennial streams or includes intermittent streams is critical particularly if a town wants to protect headwater areas. Because the buffer that is the subject of the ordinance encompasses the stream, the scope of the protected area is directly dependent on the features considered streams. For example, Princeton Township defines a waterway as any periodic or permanent stream with a contributing watershed of 10 acres and in certain more developed areas, a contributing watershed of 5 acres.

Once the streams affected by the ordinance have been identified, the width of the buffer or corridor must be determined. Typically, the starting point for measuring the buffer is from the top bank of the stream. Several municipalities in New Jersey have taken different approaches.

> *Example 1* (Site Specific Widths)
> Princeton Township identifies certain streams as more critical, such as Stony Brook and the Millstone River. The rationale for this is that larger rivers need wider corridors because they drain a larger area and their floodplains are larger. This type of buffer system is more complicated and may require more administration. The public and affected landowners may perceive the variations as unfair or arbitrary.

> *Example 2* (Expanded Buffer)

[5] A conservation easement is an agreement that protects land while leaving it in private ownership.

Baltimore County, MD expands the standard buffer width under certain environmental conditions:

- Impervious Surfaces Simply put, impervious surfaces detract from a stream corridor's ability to remove nutrients and, in addition, the pollutants that collect on graded surfaces run off into the stream. Stream corridors that have roads running parallel within them should have increased buffers to account for the increased runoff.
- Wetlands The soils with the highest moisture level, wetlands have long been recognized for their value in trapping sediment and nutrients. Federal and State law currently protect wetlands. Wetlands should not be credited towards the buffer width for a stream corridor because they are sensitive lands and excluding them from buffer width determination will not interfere with state regulations governing wetlands.
- Steep Slopes Many researchers have noted that steep slopes cannot effectively remove contaminants. In general, most municipalities define a steep slope as land having a slope of 12% or greater.

Example 3 (Variable Width Buffer)
The Stony Brook Millstone Watershed Association's model stream corridor ordinance establishes a flexible buffer. Buffer widths begin from the 100-year flood line and range from 50 to 200 feet. This allows for some discretion depending on the amount of a landowner's property that will be affected by the buffer. There is always the potential for this discretion to be abused.

Example 4 (Fixed Buffer)
The simplest of the buffers, this creates a uniform width, typically 100 feet, from the 100-year flood line. The ordinance should take care to address wetlands, which should have a buffer surrounding them as well to be consistent with the purpose of the ordinance and with applicable laws and regulations. Unfortunately, in the context of the entire ordinance, the standard buffer may not address the effects of existing non-conforming uses will have on drainage and runoff into the stream.

Example 5 (Either/Or Buffer)
Montgomery Township requires either a 100-foot buffer or 100 feet beyond the 100-year floodplain whichever is larger. Care must be taken to establish the 100-year floodplain, typically this will use maps created by the Federal Insurance Administration flood insurance maps.

The Permitted Use Section states which activities are permitted in a stream corridor. Most include natural resource activities such as stream restoration and revegetation projects, natural resource protection, monitoring and management. Other uses that may be permitted:

- Maintenance – note that dead and dying vegetation (unless it is a safety hazard) should be left to add to the build-up of the humus layer.

- Pre-existing agriculture use permitted, with a minimum buffer (e.g., 50 feet) and approved soil conservation and water quality plan.
    - Agriculture usage should be limited if possible because activities such as the application of fertilizers and pesticides, the spreading of animal wastes, the direct access of livestock to the stream and the construction of waste lagoons threaten the health of a stream and its riparian habitat. Agriculture comprises 64% of non-point source pollution impacting streams in the Northeast.[6]
    - One municipality, South Brunswick, has prohibited the use of fungicides, herbicides, pesticides, and fertilizers in stream corridors with the exception of agriculture, horticulture and silvaculture, where use is subject to municipality review.
- Necessary livestock crossings permitted, with design approval required.
- Existing Structures
    - Existing structures typically can be restored, repainted maintained or enhanced.
- Roads and Bridges
    - Allowed where no other locations are feasible.
    - Typically restricts roads to those that are oriented perpendicular to the stream corridor.
- Recreation
    - Many ordinances allow the construction of foot or horse paths within the corridor.

The Prohibited Use Section states which activities shall be prohibited in the stream corridor. One option is to prohibit all uses not specifically listed in the permitted uses section. However, many ordinances choose to list prohibited uses and this may be useful to avoid any unwanted interpretations of permitted uses that are not unambiguously defined. Examples of prohibited uses include:

- Disturbances to vegetation
    - Clear-cutting or disturbances to natural vegetation are often prohibited. This includes tree and shrub removal, clearing, burning, and spraying.
    - South Brunswick draft plan also prohibits the use of pesticides, fungicides, herbicides and fertilizers.
- Septic Systems
    - No septic fields in the corridor.
    - No sewage disposal systems may be located within 300 feet of the high level of a surface water supply.
- Grading, Excavating and Dumping
    - No soil disturbance from grading, plowing, except with approved soil conservation and water quality plan.
    - No mining or excavation, except existing uses, no dredging except as permitted by State law.
    - No deposit or landfill refuse, solid or liquid waste.

[6] David J. Welsch, *Riparian Forest Buffers* at 2 (1991).

- No underground storage tanks.
- No dumping.
- No fill to expand development area.

One noteworthy ordinance is Princeton Township's, which takes a different approach than most municipalities. Rather than listing specific uses, there are a series of factors that must be considered in light of the requested action. For example, the planning board must consider the ecological impact of the project, the relation of the proposed structures to the environment, and surface water drainage.

The Submission Requirements Section states which documents shall be submitted to the municipality in an application to perform any land disturbing activity near the stream corridor. Usually, the application must include a map of the project site with the delineation of the stream corridor boundaries, the 100-year flood line, wetland boundaries, slopes greater than 12% within the site, and the locations of all improvements proposed within those boundaries. Some ordinances also require more detailed information such as all trees greater than four inches diameter breast height (D.B.H.), soil conditions, landscaping plans, and rights-of-way easements.

The most significant problem with the stream corridor ordinances is that not all municipalities require that buffers be clearly delineated on the plans for clearing or grading and sediment control. The absence of boundaries on construction-stage plans increases the risk that contractors will encroach or disturb the stream corridor. In addition, buffer boundaries should be clearly marked on-site during construction activities.

The Variance Section lists the criteria for exemption from the provisions of the ordinance. Not all ordinances list specific reasons for granting variances. For those that do, economic hardship or conflicts with a compelling public need are the most common reasons. Some ordinances, such as Montgomery Township's, allow such a hardship variance only where the granting of the variance will not increase flood heights or the cost to the public. Montgomery also prohibits variances in designated floodways. Clinton Township's proposed stream corridor ordinance lists standards to determine when an economic hardship exists, such as when there is no alternative beyond acquiring additional land, uniqueness to the affected property, and that the problem is not due to the applicant or previous owners. Sometimes, it may be necessary to list uses for which no variance will be granted, such as for a landfill. Even when a variance is granted, the applicant is typically required to restore the remaining portions of the disturbed area with native vegetation.

Enforcement is a subject very rarely addressed by stream corridor ordinances. A landowner or developer cannot clearly determine the risks associated with a project when there are no clearly defined penalties. There may be no legal remedy for non-neighboring landowners. Any penalty or sanction should be readily discernible in order to be enforced against the violator. A good example of an enforcement section is found in the South Brunswick draft that provides for a $1,000 fine and/or 30 days imprisonment for every violation of the ordinance. Furthermore, each day the violation persists may be treated as a separate violation.

Monitoring of stream corridors buffers should be done on an annual basis in order to ensure their effectiveness. During a site visit a "code enforcement officer" should refer to a checklist stating the permitted uses of the said property under the ordinance. If it appears to the municipality that a violation of the Ordinance has occurred, the "code enforcement officer" shall initiate enforcement proceedings by sending an enforcement notice. By means of the enforcement notice, the "code enforcement officer" may order discontinuance of illegal use of land or structures; removal of illegal structures or additions, alterations, or structural changes thereto; or discontinuance of any illegal work being done. (The municipal secretary, chief of police, members of the municipal police dept. and any other persons designated by the municipality would also be authorized to enforce the ordinance).

The enforcement notice shall, at minimum, state the following:

- The name of the owner of record and any other persons against whom the municipality intends to take action.
- The location of the property in violation.
- The specific violation, with a description of the requirements, which have not been met.
- The date on which the steps for compliance must be commenced and the date on which the steps must be completed.
- That the recipient of the notice has the right to appeal to the municipality.
- That failure to comply with the notice within the time specified, unless extended by appeal, constitutes a violation with the possibility of sanctions.

Causes of Action

- Whenever a violation of the ordinance occurs, or is alleged to have occurred, any person may file a written complaint with the municipality.
- The "plaintiff" (enforcement officer, an owner, or tenant) must show substantial affect by the alleged violation and may institute appropriate action to correct the violation.
- Notice of an action authorized in the above subsection shall be served upon the municipality at least 30 days prior to the time the action is begun.

Enforcement Remedies

- Any person, partnership, or corporation who has received a notice of violation from the municipality may either correct the violation within the allotted time period, or if believed to be wrongfully served, promptly file an appeal with the municipality.
- Any person, partnership, or corporation who or which has violated or permitted the violation of the provisions of the ordinance shall, upon being found liable therefore in a civil enforcement proceeding commended by the municipality pay a judgment plus all court costs including reasonable attorney fees incurred by the township as a result thereof. Each day that a violation continues shall constitute a separate violation. All judgments, costs, and reasonable attorney fees collected for the violation of the ordinance shall be paid to the municipality.
- In addition to the above remedies, the municipality may take other appropriate legal action, which may include equitable and injunctive relief, to enforce the provisions of the ordinance.

IMPLEMENTATION

An important first step in developing a SCO is to ensure that your Master Plan has a stream corridor protection and a stormwater management section that supports such an ordinance. To pass a stream corridor ordinance in your municipality it must be introduced, or have a first reading, at which time a public hearing date is set. A public hearing or second reading must take place at least ten days after the introduction or first reading of the ordinance and notice of the hearing must be given in the official newspaper seven days in advance of the hearing. After the ordinance is introduced, the planning board is given 35 days to review and comment. The ordinance must be published in the official newspaper by title and include either a summary of the substance or the entire text of the ordinance. Informal copies of the proposed ordinance must be made available to the public at the municipal offices.

After the public hearing or second reading, the ordinance is then voted on and is passed, defeated or revised. If significant changes are made to the ordinance during the public hearing, it will have to be re-introduced. After the ordinance is passed, the governing body must publish the title and include either a summary of the substance or the entire text of the ordinance.

In addition to introducing a stream corridor ordinance, your municipality should consider implementing the following:

- A public information campaign should be developed to explain the benefits of a stream corridor protection ordinance.
- Streams, including headwaters, should be mapped and existing land uses that may pose a threat to water quality (e.g., septic tanks, storage, farming, etc.) should be marked on the map.

Ordinances protecting the stream corridor should be viewed as part of a larger picture, which is meaningful conservation of the environment in a municipality. As a result of the interconnections in the environment, additional ordinances or land use "tools" should be considered as complementary to the Stream Corridor ordinance in order to better ensure that a community achieves its desired conservation objectives. Your community needs to determine what its goals are for protecting the environment and the next steps it should take to reach these goals. Additional supporting land use ordinances would include, but certainly not limited to, the following:

- Stormwater Management
- Usable Lot Restrictions
- Clustering / Lot Size averaging ordinances
- Impervious cover limitations
- Shade Tree/Woodland Protection
- Well-head Protection
- Ground Water Recharge
- Septic System Maintenance and Monitoring

RESOURCES

Association of New Jersey Environmental Commissions, "Protecting Our Streams" (P.O. Box 157, Mendham, NJ, 07945, 973-539-7547, www.ANJEC.org).

Brandywine Conservancy. *East Vincent Township Draft Zoning Ordinance, April 2002 ARTICLE XXIII – ENFORCEMENT* (610-388-2700).

Center for Watershed Protection, www.cwp.org

Cox, William, *New Jersey Zoning and Land Use Administration* (2001 ed.).

Delaware & Raritan Greenway

Model Stream Corridor Protection Ordinance prepared by the Stony Brook-Millstone Watershed Association (609-737-3735).

New Jersey Conservation Foundation, www.njconservation.org (908-234-1225).

North Jersey Resource Conservation and Development, Technical Guidelines for Streambank Restorations (908-735-0733).

Rosgen, Dave, *Applied River Morphology* (1996).

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Society for Ecological Restoration, www.ser.org

United States Department of Agriculture, "Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources" (202-512-2250) (1991).

Welsch, David J., *Riparian Forest Buffers* (Forest Resources Management, USDA) (1991).

Wenger, Seth and Lori Fowler, "Guidebook for Developing Local Riparian Buffer Ordinances" (Office of Public Service & Outreach, Institute of Ecology, University of Georgia, 706-542-3948) (1999).

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ACKNOWLEDGEMENTS

We wish to thank the William Penn Foundation and New Jersey Future for their generosity in funding this project. Thanks also to Sam Hamill and Rebecca Hersh from New Jersey Future; Leanne Foster from New Jersey Conservation Foundation; Abbie Fair from the Association of New Jersey Environmental Commisisons (ANJEC) and Ann Alexander from Rutgers Environmental Law Clinic for their help in developing and reviewing this package. Special thanks to our Board of Trustee members Bart Bennett and Ted Stiles for their support and suggestions.