

Future Land Use Plan

Comprehensive Plan

Village of Barrington Hills

- Residential (5 acres and more)
- Residential (Less than 5 Acres)
- Suburban Residential
- Institutional/Civic
- Conservation, Open Space, and Recreation
- Business
- Planned Mixed District
- Light Industry
- Incorporated Municipalities
- Unincorporated Property



NORTH



0 0.5 1 2

Scale in Miles

Base Map Data Provided by
Gewalt Hamilton Associates, Inc.





land use

Focus Areas

From a planning perspective, Barrington Hills may have more in common with first ring suburbs than it does with the communities which form the suburban/rural growing edge of the metropolitan area. It is, for the most part, a mature community where change may occur as infill and redevelopment. Many mature communities recognize the existing conditions of the majority of properties as the likely conditions of the future, and through their planning process focus on a limited number of properties most likely to be subject to redevelopment pressure. The Barrington Hills planning area encompasses four general areas, listed below in an increasing order of vulnerability to change:

- Areas within the Village boundaries, including existing residential (5 acres and over) uses that are, in near term and long term, the most appropriate use of such property.
- Forest Preserves and environmentally sensitive sites and open water governed by permanent conservation easements.
- Areas outside the Village which fall within the joint planning jurisdiction of Barrington Hills, adjacent municipalities, or the surrounding county.
- Property of a size and geography which make them subject to development pressures.

This plan for the future use of property cannot anticipate all of the influences on land use decisions made by property owners, but it can foresee patterns of use most likely to yield long term compatibility and continuity of the existing attractive village character and quality of life. This plan, as initially adopted includes a broad characterization of land use for all properties in the “Future Land Use Plan” (see page 34). The land use designations reflected in the “Future Land Use Plan” are amplified by the recommendations of the environmental corridor overlay described previously in this document. Over time, the Village will evaluate each of the properties most vulnerable to change, and where appropriate, may adopt amendments to the plan which supplement this land use plan with greater detail. In the appendix, two such more specific plans are included for Focus Area Seven and Nine. These two focus areas on the periphery of the Village have been subject to significant development pressure, motivating their owners to seek de-annexation and development outside the Village. The land use plans for these two focus areas show how their development can be accommodated while compatible and supportive of Barrington Hills community character and quality of life.

Focus Area One: Nearly 670 acres straddling Spring Creek, directly north of the Spring Creek Nature Preserve, these lands are, predominantly outside the Village boundary, though wholly surrounded by the Village. The property is maintained as equestrian facilities by a family well known for its connections to the equestrian community. Proximity to the creek, its floodplain, tributaries and wetlands make the site both visually attractive and particularly sensitive.

Focus Area Two: Nearly 535 acres, also straddling Spring Creek and Beaver Lake, sandwiched between the large expanses of the Spring Creek Nature Preserve and the fork formed by Highways 62 and 68. The property is currently under active agricultural use.



Focus Area Three: Approximately 110 acres, south of Healy Road, toward the southwest corner of the village, adjacent to ComEd rights-of-way and near the gravel mining areas in East Dundee.

Focus Area Four: Approximately 200 acres, north of Highway 62, directly west of the Spring Creek Nature Preserve, and lying east of the ComEd rights-of-way.

Focus Area Five: Generally bound by State Highway 62 to the north and east, Bolz Road to the south, and State Highway 25 to the west, this approximate 215 acre focus area may be affected by the potential Bolz Road Bridge over the Fox River and the resultant realignment of Bolz Road.

Focus Area Six: Just under 185 acres, at the intersection of County Line Road and State Highway 62. Along with multiple properties adjacent to School District 220's property, this property may be affected by a potential Bolz Road Bridge, if constructed.

Focus Area Seven: On approximately 565 acres of rural land in the Northwest periphery of the community, this site has been the subject of court action to permit de-annexation from the Village of Barrington Hills and potential development within the County of McHenry. It includes properties outside the village and property south of Spring Creek road that is still within the village. The Villages of Barrington Hills and Algonquin opposed a petition to develop the property (within the village, and later outside the village) at suburban densities with lot sizes of less than one acre. The property is within an area of McHenry County which is subject to very heavy development pressure, and where water supply is limited and threatened by continued mining of the shallow aquifer at rates which exceed their capacity. As proposed by the property owner, the development would have placed a burden on existing school and road capacity not sized or suitable to accept the stresses of suburban density.

The village supports the reasonable use of the property for residential uses, but considers the environmental features of the site and the capacity to support development as important influences on the most appropriate use of the property. The site is shown (in the appendix depicted as the "Duda Properties") in a plan reflecting a "conservation design" concept of 86 single-family home sites arranged to enhance and maintain the existing wetlands, woodland, floodplain, subsurface aquifer, and other natural features as site amenities. As has become the desired practice within the village, the lots are in a layout which leaves no "common area" ownership. However, private open spaces with an interwoven equestrian trail system with equestrian access easements and links to the larger village of Barrington Hills trail system would enhance the marketability and utility of the property as an extension of the equestrian community. The Village has identified this site as an example on the periphery of the community in which the deviation from minimum lot size can be accommodated yet still maintaining the average density of one lot per five acres.

Key features of the successful development of this site would include:

- Protection of the ground water resources.
- Incorporation of the existing wetlands, floodplain, woods, and other natural features as site amenities.
- Maintain an overall density of not exceeding one dwelling per five acres of land
- Interconnection to existing equestrian trails on the periphery of the site with supporting private equestrian easements.



Focus Area Eight: Oak Knoll Planned Unit Development. Directly east of the Barrington Hills Country Club and south of the Union Pacific railroad, the approximate 85 acre property is a mixed use district subject to an existing Planned Unit Development ordinance within the Village of Barrington Hills. By nature of the light industrial uses, its limited accessibility and other conditions make it vulnerable to change.

Focus Area Nine is generally located at the Northwest corner of Illinois Route 72 and Illinois Route 59, between the Forest Preserve of Cook County and the former Klemm Nursery with portions of the property currently being developed for residential and commercial uses in the Village of South Barrington. This approximate 340 acre property, more than any other in the village, is influenced by its accessibility, its proximity to regional shopping, nearby employment, and rapid growth in the adjacent urbanizing Metropolitan Chicago, to the southeast. It is also less influenced by the residential and equestrian community than most properties in the village. Across the EJ&E RR right-of-way to the west, the Cook County Forest Preserve is adjacent to the site, providing potential transition between a more intense use oriented to Illinois Route 59 and Illinois Route 72 and the core of the community. Illinois Route 59 is a principal gateway into Barrington Hills, enhanced by high capacity interchange with Interstate 90, just ½ mile south of the site. Redevelopment of the more than 900 acre Poplar Creek (Neiderlander) property as part of the Sears Headquarters/ Prairie Stone Business Park has accelerated with recent additions of “big box” retailing, a proposed arena, and continued employment and distribution centers. The Klemm Nursery property immediately east of the site on Illinois Route 59 is being subdivided for higher density single family homes and a proposed “lifestyle” retail center. Each of these surrounding uses provide both a connection to the pattern of the greater metropolitan area and a distinction from the pattern of 5 acre minimum lot size and predominant land use of the core of the Village of Barrington Hills.

Rather than disassociate the site and use from the Village, this site presents an opportunity to encourage a mixed commercial retail and residential development in the context of the Village, and of a quality and character reflective of the high standards of the Village of Barrington Hills. If developed solely responsive to trend of development and proximity to the Interstate interchange, the site is likely to yield a conventional strip retail use and potentially high density housing that, at best, will be indistinguishable from development in other corridors; at worst, an unattractive, disruptive entry to the Village. In preparing a concept plan for Focus Area Eight, shown in the appendix as “The Stables of Barrington Hills”, the Village attempts to integrate key natural features of the site and surroundings in an effort to leverage the greatest village character and quality. Dubbed “the Stables of Barrington Hills”, the concept integrates equestrian facilities including paddocks, trail access, and equestrian social spaces into a retail lifestyle center of over 450,000 square feet of retail floor area. The site is mixed use, integrating office, residential and multiple forms of retail uses into the natural physical features of the site.

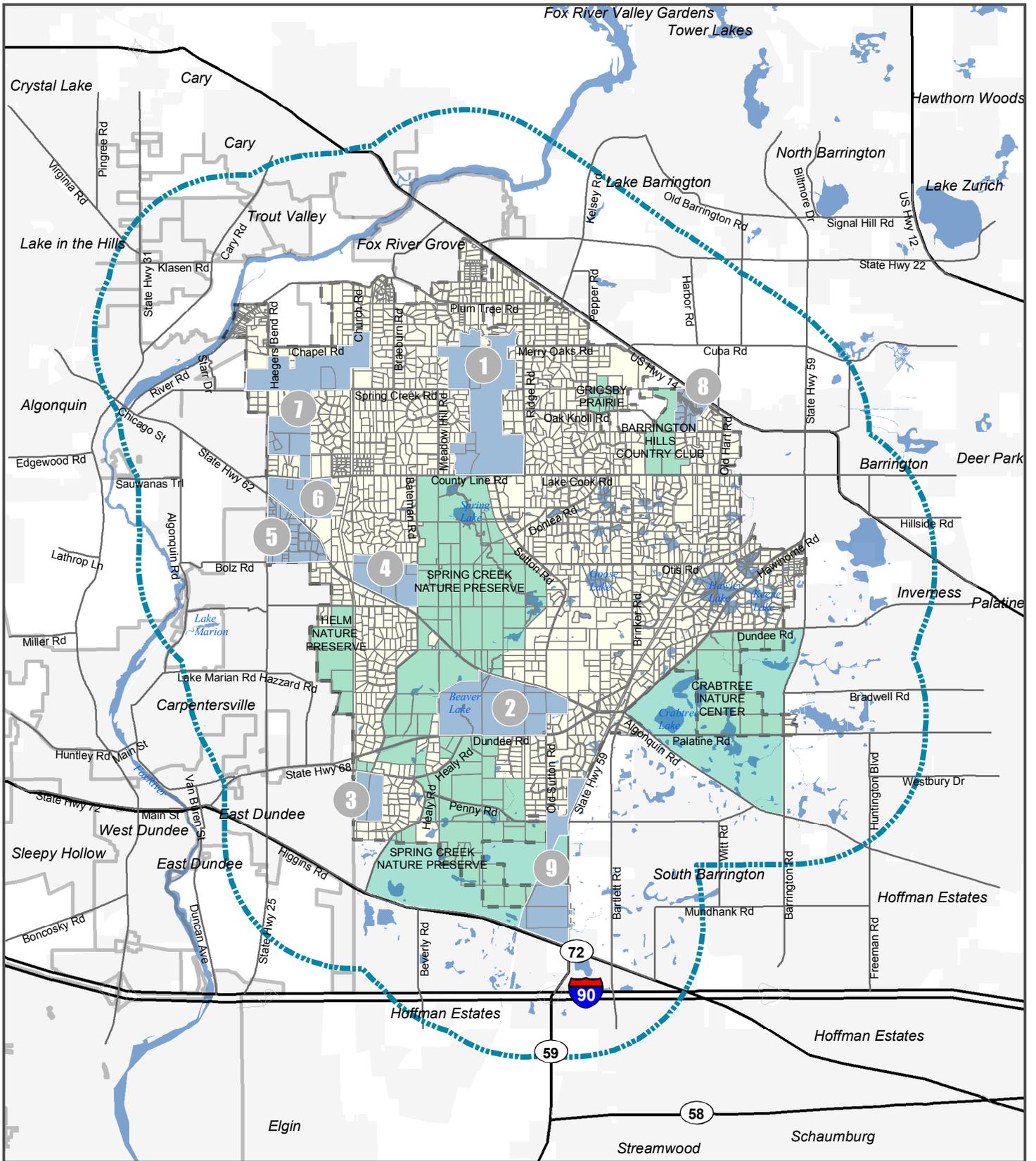


Key features of the successful development of this site would include:

- Incorporation of the two unnamed Spring Creek tributaries, and on-site detention as natural amenities in the site and use.
- Connection, extension and incorporation of the equestrian trail system and equestrian activities into the design of the facility.
- Controlled and convenient access to Illinois Route 59, with the diversion of Old Sutton Road into the site so as to minimize through traffic.

Focus Area Ten, the Cook County Forest Preserves, at over 4,000 acres is more than 20% of the total area of the village, and has a significant influence on the health and quality of the natural environment throughout the village. At the present time there are no clear long term plans for further development of the forest preserve district property within Barrington Hills. Because the forest preserve district is such a large landholder whose open space is critical to the character of the area, the village should work closely with the Forest Preserve District to ensure that long term plans for the village are in keeping with the village's comprehensive plan.

Focus Area Eleven, unincorporated property within one and one half miles of the Village Boundary.



Planning Focus Areas

Comprehensive Plan

Village of Barrington Hills

- Planning Focus Areas
- 1.5 Mile Planning Limits
- Incorporated Land
- Unincorporated Land



NORTH





0 0.5 1 2

Scale in Miles

Base Map Data Provided by
Gewalt Hamilton Associates, Inc.





conservation design practices

Application of Conservation Design

The use of conservation design practices is not intended to be widely applicable throughout the community, nor modify the predominant 5 acre character of the community. Only under exceptional and unique circumstances would the Village support or encourage deviation from the traditional large lot subdivision pattern. Such exceptional conditions might be found on parcels at the periphery of the village where the character of development in adjoining communities affects the potential to protect the natural features of the property with large lots.

On its own, this Comprehensive Plan cannot enable the establishment of conservation design. Follow-up through the adoption of amendments to the zoning, stormwater management, and subdivision ordinances would be necessary in order to fully implement these tools.

The fabric of Barrington Hills is woven into the five acre minimum lots that have supported both an attractive, sustainable living environment and the equestrian activities that are fundamentally different from other low density communities. As it looks to support this 5 acre pattern, the village recognizes that there are certain physical conditions on a very few properties and certain market forces which may work to undermine the stability of this fabric. As it looks at these few properties, the village is not intending to deviate from the existing pattern of single-family detached dwellings in a way that would encourage townhouses, condominiums, multi-family dwellings, zero lot line homes, or other deviations from that single-family detached pattern. The village looks to use those planning practices that might support the appropriate uses of these properties, particularly those on the periphery of the community adjacent to higher intensity uses, in a way that further enhances the continued enjoyment of the larger sustainable community environment. One of these planning practices is the use of a development strategy known nationally as “conservation design”. This label may be new to the village, but the concept is not. Inherent in the practice of “plating to the center” of lakes and other natural features which guarantee property-owner responsibility for maintenance and oversight of critical natural features, the village has had considerable experience in property development that specifically respects natural features.

Conservation Design Principles

Conservation design is a design system that takes into account the natural landscape and ecology of a development site and facilitates development while maintaining the most valuable natural features and functions of the site. Conservation design includes a collection of site design principles and practices that can be combined to create environmentally sound development. The main principles for conservation design are:

- Flexible Lot Design Standards*
- Protect and Create Natural Areas and Drainage Systems*
- Reduce Impervious Surface Areas*
- Implement Sustainable Stormwater Management Techniques*

Along with a description of each principle, this section will highlight and discuss the specific site design practices that should be considered to implement these principles. The site design practices are taken from the *Conservation Design Resource Manual*, which is produced by the Northeastern Illinois Planning Commission (NIPC) and Chicago Wilderness.



Practice 1: Lot Size and Open Space

Rather than controlling density by increasing lot size requirements, conservation design looks to implement standards for overall density on a given site without rigid lot size standards. By modifying minimum lot size requirements, communities encourage creative developments designed to be both profitable and sensitive to the pre-development character of the development site and community at large.

Lot Size and Open Space

The basic principle underlying the practice of conservation design is the protection of natural and cultural resources through design flexibility. This flexibility involves the reduction of lot sizes in a development in exchange for setting aside the remainder of the property as significant amounts of natural, open space land.

In addition to allowing design flexibility, some experts argue that communities should mandate ambitious open space set asides as well. For example, to meet the definition of conservation design, a development in Lake County is required to have a substantially higher percentage of the development site set aside as open space.

Practice 2: Arranging the Development Site

The process of laying out lots, roads, and natural areas is one of the most important aspects of conservation design. Conservation design advocates for a sensitive approach to the landscape, an approach which treats each development site as a unique challenge to be approached with the complementary goals of developing the maximum allowable number of lots and conserving natural lands and processes to the greatest possible extent.

The following four-step process for arranging the development site are: (Arendt 1996).

Identify all Potential Conservation Areas. This will include all inherently unbuildable areas (floodplains, wetlands, steep slopes) and also buildable areas that are sensitive environmentally (natural areas, stream and wetland buffer areas, woodlands, etc.), significant historically and culturally, or important for conservation for some other reason. The developer will be responsible for identifying the conservation areas; a community resource inventory or comprehensive plan can be a valuable tool in monitoring the protection of conservation areas.

Locate the House (or other building) Sites. At this point, only the specific sites for buildings to be constructed should be located. To maximize the revenue potential of the sites, the developer will take care to locate the sites to maximize views and access to natural areas and other amenities.

Design the Street and Trail Systems. Determine how to most efficiently lay out the street system to access every home. Similarly, homes should have easy access to walkways and equestrian trail systems within the development and throughout the remainder of the Village.

Draw in the Lot Lines. This is the final step and should be fairly straightforward once the building sites and street system have been identified.



Practice 3: Natural Area Protection and Conservation

Conservation design encourages the dedication of open space on a site that will protect and restore natural areas and resources, and provide for passive recreation where appropriate. Through a conscientious site design process, the development can be configured to maximize the areas that are protected and conserved.

Possible areas to evaluate for protection include hydric soils, streams, lakes, wetlands, floodplains, steep slopes, significant wildlife habitats, remnant prairies, woodlands, farmland, and sensitive aquifers and their recharge areas. Certain sensitive areas, including floodways, flood fringes, non-isolated wetlands, isolated wetlands, and threatened and endangered species habitats may be protected by federal, state, and local statute.

Natural area buffers are an important strategy for protecting sensitive natural areas. The following list enumerates several benefits resulting from the use of buffers:

- Slows water runoff.
- Removes up to 50% or more of nutrients and pesticides in runoff.
- Removes up to 60% or more of pathogens in runoff.
- Removes up to 75% or more of sediment in runoff.
- Reduces noise and odor.
- Serves as a source of food, nesting cover, and shelter for wildlife.
- Stabilizes streambanks and reduce water temperature in stream.
- Reduce downstream flooding.

Greenways, or linear corridors of green, can function to preserve natural resources and in some cases define or link a trail system. Linking and providing connections to existing and proposed trails and greenways provides additional benefits to natural resource protection. Existing local greenways may be protected by municipal, park, forest preserve, or conservation districts, and county transportation departments. Communities also may decide to include significant historic and cultural assets in designated open space areas. Through the comprehensive planning process, communities will determine which of these areas are most relevant and important for conservation.

Practice 4: Natural Landscape Sensitivity

Excess stormwater runoff, and the resultant flooding and erosion, arise from development and alteration of the natural landscape. For this reason, it is highly desirable to preserve or restore features of the natural, pre-development landscape whenever possible. Careful consideration of the pre-development landscape can vastly improve the drainage and stormwater runoff performance of a development.

On sites that have been altered through grading, engineered drainage systems, and agricultural conversions, developers should be encouraged to study the original landscape and design the landscape using the original as a guide. On sites that have not been substantially altered from their natural form, developers should be encouraged to preserve this form.



Generally, substantial alteration of the existing site landscape is discouraged. Special consideration should be given, however, to proposals which seek to restore a site to its original natural form through careful and conscientious study. Restoration of the natural landscape will not be appropriate in all cases, but should be permitted unless there is a compelling agricultural or ecological reason to avoid it.

Practice 5: Natural Landscaping

Natural landscaping is the design, construction, and maintenance of landscapes that provide the beneficial natural functions that are lost through installation of conventional lawns or agriculture. Natural landscaping stresses the preservation and reintroduction of plants native to our area. The native plants used in natural landscaping are hardy and attractive. They can be used to stabilize soil, reduce flooding, absorb pollutants, and sustain wildlife.

Native landscaping has been defined as the use of plants – for example, prairie, woodland and wetland plants – that flourished in northeastern Illinois prior to settlement. Natural landscaping is a more popular and broader concept because it implies the use of native plants but also suggests landscaping to give the “look” of the landscape that existed before the mid-1880s. In addition, there also may be an attempt to restore or reconstruct the landscape to look and function more as it did before settlers, other than Native Americans, lived here.

Presently, the predominant landscaping material of the Chicago region is the turf grass lawn. The lawn is borrowed from the heavily grazed, short grass pastures and formal gardens of Europe, and provides aesthetic appeal and recreational space. This modern landscape contrasts sharply with the predominant landscape prior to European settlement. Then, prairies were interspersed with woodlands, savannas, and wetlands. Hundreds of species of plants could be found on every acre of land. It should be noted that, while turf grass lawn is an option, the Village encourages the return of open space to natural prairie.

Practice 6: Open Space Management

Planning for open space and natural resource protection in conservation design must include short and long term management for both routine and remedial maintenance. The maintenance responsibility should be detailed as part of an agreement between the property owners.

In Barrington Hills, the two preferred approaches to managing natural areas are:

- The natural area may remain in the private ownership of the property owner, a homeowner’s association, or another appropriate entity.
- A conservation easement can be granted to the government (local, state or federal) or to a not-for-profit whose primary purpose is in keeping with conservation development and design, such as the Citizens for Conservation or the Barrington Hills Conservation Trust. The benefits of a conservation easement are its flexibility, the potential for income tax reduction, estate tax reduction, and property tax reduction for homeowners.



Practice 7: Roadway Design

Wherever practical, the Village of Barrington Hills has worked to limit the establishment of an extensive network of public streets. The nature of roadway design in conservation design is compatible with existing Barrington Hills' practices that scale the design and responsibility to the nature of the traffic that will use it. While streets and roadways often are viewed primarily as transportation facilities, conservation design recognizes that streets are a major element of the built environment. For this reason, conservation design seeks to maximize the functional effectiveness of roadways without overbuilding, and while considering the aesthetics of the street. Narrower streets not only reduce overall impervious surface area, leading to improved stormwater management, but also encourage slower traffic speeds. Village road standards, for both public and private roads, should reflect an appropriate balance between aesthetics, maintenance, traffic management, and public safety.

The conservation design model naturally shortens road lengths by grouping developed areas where feasible. Care should be taken to carry on this natural reduction of road area through the road design process. Minimizing paved surface area is important; a second important consideration in roadway design is the conservation of scenic views and vistas. This is especially relevant in rural, conservation development communities.

Conventional developments generally include curb-and-gutter edging for new roads. Alternative edge construction and vegetated swales are other ways not only to reduce overall imperviousness but also to support the goals of impervious surface area reduction and improved stormwater management.

Practice 8: Vegetated Swales

The term "swale" (a.k.a., grassed channel, dry swale, wet swale, biofilter) refers to a series of vegetated, open channel practices that are designed specifically to treat and attenuate stormwater runoff for a specified water quality volume. As stormwater runoff flows through the channels, it is treated through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Maintenance of grassed channels mostly involves maintenance of the grass or wetland plant cover. Swales may be used in the street right-of-way and throughout the site.

Most jurisdictions require that curb and gutter systems be installed along residential streets to convey stormwater runoff. Curb and gutter systems, however, provide no stormwater treatment and quickly discharge stormwater directly into streams. By contrast, open vegetated swales that could provide better treatment are usually discouraged or prohibited. Unlike curb and gutter systems, which move stormwater with virtually no treatment, open vegetated swales remove pollutants by allowing infiltration and filtering to occur. Open swales encourage groundwater recharge, and can reduce the volume of stormwater runoff generated from a site.



Practice 9: Driveway Design

Like roadways in general, driveway lengths are naturally shortened by the form of conservation design. Homes are located closer together and closer to roads and streets. As a result, long driveways are rarely necessary to provide adequate access to homes and garages. Thoughtful techniques can be employed to further reduce driveway surface areas. In many cases, common residential drives serving 2-5 housing units are appropriate. Because driveways can be constructed to reduced standards with regard to design speed, alignment, compaction, and pavement or gravel surfaces, this is a low impact way to save on impervious surface area.

Since conservation design encourages the use of on-street parking, it is less important to provide overflow parking in private driveways.

While permeable paving blocks are only sometimes appropriate for parking areas and public roadways, they are nearly always appropriate for driveways. Allow the use of permeable pavers, gravel, or other pervious surfaces for driveways in conservation subdivisions.

Practice 10: Roof Runoff Management

Roofs are one of the most important sources of concentrated runoff from developed sites. One of the best ways to decrease the need for stormwater management systems is to manage rooftop runoff on site, instead of moving stormwater through a conveyance system. Along with reducing downstream impacts and decreasing annual runoff volumes, it can also significantly reduce the annual pollutant load.

The practice most often used to infiltrate rooftop runoff is the dry well. In this design, the storm drain is directed to underground rock-filled trenches. French drains or Dutch drains also can be used for this purpose. In these designs, the relatively deep dry well is replaced with a long trench with a perforated pipe within the gravel bed to distribute the flow throughout the length of the trench.

Run off can be diverted to a pervious area or to a treatment area using site grading, channels, and berms. Treatment options include grassed swales, bioretention, or filter strips. Alternatively, rooftop runoff can simply be diverted to pervious lawn areas, as opposed to flowing directly to the street, and thus storm drain system.

Practices that store rooftop runoff, such as cisterns and rain barrels, are the simplest in design of all rooftop runoff treatment systems. Some of these practices are available commercially and can be applied in a wide variety of site conditions.

Other practices include vegetated roof covers, also called green roofs and extensive roof gardens, which involve blanketing roofs with a veneer of living vegetation. These systems can reduce roof runoff as well as provide an aesthetic benefit to homeowners and communities.



Best Equestrian Practices

The Village's objectives call for a reliance on the individual responsibilities of land owners as a primary approach to the achievement of community goals. Not the least of those goals are found in the area of the natural ecology of the village. As the significant land holders, the equestrian community of Barrington Hills may have the greatest opportunity to assure that horse raising, riding and associated activities have a positive impact on the environmental condition of land and water in the village. Safeguarding surface water (creeks, rivers, ponds, etc.) and groundwater must be an important everyday part of horse keeping. Without voluntary adherence to good horse keeping practices, surface and groundwater are subject to pollution from:

- Sediment from eroding areas such as overgrazed pastures, roads and trails, and bare soil in paddocks, turnouts, corrals and arenas
- Polluted water draining from manure piles and horse wash areas
- Excessive nutrients (from horse waste) that wash off pastures during storms
- Removal of tramped vegetation at streamside areas that can lead to streambank erosion
- Removal of vegetation which filters and absorbs water and pollutants from runoff

The three basic objectives for good horse keeping include:

1. Control erosion – keep soil in place

- Keep areas well vegetated and restore bare areas with vegetation. Plant roots, especially those of grasses, hold soil in place and help water infiltrate into the ground rather than run off. Vegetation also dissipates the force of rainwater hitting the ground, which detaches soil particles.
- Avoid concentrating water. Concentrated runoff can be highly erosive. Try to disperse runoff by spreading it out in a thin, shallow “sheet.” Areas to watch are roads, roofs, compacted soil, and other impermeable surfaces that shed water quickly and increase the amount and velocity of runoff.
- Control horse access and human activities in vulnerable areas such as wetlands, creek banks, meadows and steep hillsides. Limit access, especially during wet periods.
- Manage pastures to prevent heavy grazing. Avoid soil compaction and excessive removal of vegetation by timing the use of pastures and controlling the number of horses. Rotate pastures to allow them to rest from grazing, to allow grasses to regrow and mature so they will reseed.
- Use filter strips and riparian buffers near creeks. Maintain a strip of dense grass downslope of bare areas such as paddocks and turnouts to help trap sediment. Riparian buffers provide valuable wildlife habitat and should contain a variety of plants including grasses, forbs, shrubs and trees.
- Keep creek banks vegetated to hold soil in place, trap sediment, and provide valuable wildlife habitat. Grasses have fibrous roots that hold the soil in place. A good indicator of root mass in grasses is the above ground growth generally equals the below ground root system. Shrubs and trees have deeper roots that are either fibrous or taproots that will anchor the soil in place.



- Install kick boards or lay railroad ties or telephone poles around arena perimeters. These will help hold footing material in place and keep it from washing away.
- Properly construct and maintain roads, trails and parking areas. Protect earthen surfaces and drainage ditches from erosion by using properly designed drainage systems, including diversions and culverts. Use appropriate surfacing materials and techniques.
- Use proper construction techniques. Revegetate areas disturbed by construction. During construction install and maintain silt fences or straw bale sediment barriers to trap sediment and slow the movement of water. Avoid soil disturbing activities just before and during the rainy season.

2. Keep “clean” water clean

- Divert “clean” water around areas with pollutants. Use berms, grassed waterways, underground pipes, culverts, or other methods. Consider where water will be diverted to, so as not to create new problems on the diverted path.
- Locate buildings and confinement areas away from creeks, steep slopes, and floodplains.
- Minimize disturbance to wetlands, riparian areas and meadows.
- Limit impacts of grading, runoff from roofs and other impermeable surfaces.
- Maintain vegetation and replant bare areas.
- Control potential runoff from water troughs.

3. Manage “polluted” water

- Keep the size of intensively used areas small to help reduce the volume of polluted water.
- Manage Manure. Remove manure regularly –daily is best. Cover stored manure with a roof, tarp or other cover, and direct runoff away from the manure storage area.
- Use filter strips to trap sediment and waste that washes off high-use and manure storage areas.
- Maintain soil moisture during the dry season by sprinkling with water to enhance bacterial decomposition of nutrients. When soil moisture is maintained in arenas, paddocks, feeding areas and even pastures, the natural breakdown of urea will occur. If areas are maintained as absolutely dry, this discourages the natural process.
- A waste pond can be designed to store water for safe distribution at a later time.