

Date: July 2, 2007

From: Forest Preserve District of DuPage County
Office of Natural Resources Staff
John "Ole" Oldenburg, Director

Re: An Assessment of Potential Environmental Impacts to
West Branch Forest Preserve pertaining to the Proposed
Re-Zoning of the St. Andrews Property

The Forest Preserve District of DuPage County, Office of Natural Resources, has evaluated and assessed the potential impacts to the West Branch Forest Preserve that could result from a change in zoning on the adjacent St. Andrews land parcels. The St. Andrews parcels (Subject Property) comprise 200 acres of land adjacent and immediately west of the West Branch Forest Preserve. This assessment of re-zoning the St. Andrews parcels is found to have an adverse impact on the adjoining West Branch Preserve (Preserve).

Causal Factors:

Upon annexation, the Subject Property would be zoned ER-1 Estate Residential with a minimum lot size of 40,000 sq. ft. The request is to rezone the parcels to R-3 Single Family Residential with minimum lot sizes of 9,000 sq ft. The change in zoning will result in a greater density of residential development per acre, an increase in the supporting infrastructure constructed for those residences (stormwater, sewer, water, & other utility systems), and an increase of impervious surfaces of up to 4 times that of ER-1 zoning. In addition, an increase in the general magnitude of construction compaction and alterations of the surface and subsurface soils across the 200 acre property is anticipated due to the increased density of the built environment. These combined factors will cause: 1) an increase in surface runoff volume, 2) a decrease in water quality, and 3) a decrease in ground water infiltration.

Resources at Risk:

Although the Subject Property and Preserve are bisected on the land surface by Klein Road, these two landscapes are integrally connected through the similar geology and unique surface and sub-surface hydrology. This connectivity serves in establishing unique and sensitive environmental conditions influencing the landscape ecology and ecosystem health with fragile habitats supporting diverse plant and animal communities within the West Branch Preserve and the West Branch of the DuPage River. These communities are found within the river, floodplains, grasslands, shrub lands, and wetlands, including rare ground water driven perched fens, hanging fens, and calcareous seeps. The District has recorded at West Branch Preserve 553 plant species (Appendix A) and 231 wildlife species (Appendix B). Ten species known to occur in the Preserve are listed as threatened or endangered in Illinois and 22 species are listed as Species In Greatest Need of Conservation.

Resultant Adverse Negative Impacts:

According to available GIS data sets, the entire acreage of the Subject Property has a direct surface and sub-surface hydrological connection to West Branch of the DuPage River.

Increased Surface Runoff Volume

Of the Subject Property's 200 acres, 40% drains directly toward the West Branch Preserve and then into the West Branch of the DuPage River, and 34% flows north, eventually draining into Hawk Hallow Forest Preserve and then into the West Branch of the DuPage River. The remaining 26% of the Subject Property drains south through Old Wayne Golf Course and then into the West Branch of the DuPage River. The increase of impervious surfaces and general soil disruptions/compaction on the Subject Property will result in increased surface runoff volume that would have previously infiltrated the soils and ground aquifers. We would anticipate that at least 40% of the total volume of increased runoff will flow through constructed storm-sewers, sub-surface tiles, and culverts on the Subject Property, which will outlet directly into Preserve fen and wetland communities. One-hundred percent of the Subject Property having increased surface runoff volume will end up in the West Branch of the DuPage River, thus adding to volume challenges created by developments in the upstream watershed (Exhibit 1).

Decreased Water Quality

Increased runoff volumes will carry more sediment and greater chemical loadings. More roof tops, driveways and streets collect more greases, oils, de-icing salts, and other chemicals and sediments. More lawn care-takers use more pesticides and fertilizers which run-off and cause additional chemical loading contributions. These loadings will decrease water quality within the river negatively impacting fish, mussel, and other important aquatic invertebrates. These additional negative impacts to water quality entering the West Branch of the DuPage River only exacerbate an already impaired stream system as assessed by Total Maximum Daily Load (TMDL standards) designated by IEPA.

Decreased Ground Water Infiltration

The shift toward greater surface runoff volumes from the Subject Property will result in a reduction in ground water infiltration. A significant portion of all ground water infiltration on the Subject Property is filtered through the sub-surface geology that flows toward the West Branch River valley. Exhibit 2 depicts a soils overlay on the Subject Property indicating a natural retention and absorption of precipitation on hydric Thorp, Ashkum, and Drummer soil types which comprise only 33 acres or 16% of the Subject Property. The remaining soils have greater infiltration rates. Soils such as the Ozaukee soil type are typically associated above fen and seep communities as they greatly accelerate infiltration and water recharge of sub-soil aggregates. These infiltration soils build a hydrological connection to the Preserve. Of particular importance, is the sub-surface hydraulic head of the ground water beneath the Subject Property that holds water like a large porous sponge above the river valley. The water moves toward the river through gravel and rocks above and along what geologists call the Wadsworth glacial till material. This extensive layer of diamicton - clayey till allows water to stay perched

above the deeper glacial outwash materials that comprise the deeper river valley and terraces. The water flows laterally through shallow sub-soil sands, gravels, and rock under hydraulic head pressure becoming enriched with minerals such as magnesium and calcium carbonate.

As water moves east nearing the river valley wall in the Preserve, it pours through the various fractures within the Wadsworth glacial till and then seeps out of the valley wall at the ground surface. These magnesium and calcium carbonate enriched seeps support rare plant communities such as graminoid fens and calcareous seeps (Exhibit 1 & Appendix C). These communities are uniquely perched and hanging along the river-valley wall within the Preserve directly east of the Subject Property. These rare habitats will be profoundly depleted if groundwater infiltration on the Subject Property is shifted to a surface water discharge system resulting from the R-3 zoning development impacts.

Public Trust Investment:

Over the last 34 years, the District has acquired 625 acres that comprise the Preserve at an expenditure price of \$4,700,000; now valued in today's dollars at approximately \$65,000,000. In addition the District has developed capital improvements inclusive of two recreational fishing lakes, shoreline stabilization and erosion control, parking facilities and trail system at a cost of \$1,400,000. The District is mandated by statute to preserve and protect these lands inclusive of the plants and animals, and to restore, restock, preserve and protect these resource, as nearly as may be, in their natural state and condition for the purposes of conservation, education, and recreation of the citizens and guest of DuPage County.

In demonstrating this continued responsibility, the District recently committed in 2006 and 2007 an additional \$5,000,000 for wetland restoration, \$1,300,000 in habitat enhancement of the West Branch River, and \$1,125,000 for restoration work on the west valley wall fen community. Using current land valuations, the Forest Preserve District of DuPage County has a demonstrated financial commitment of public trust investments in the West Branch Preserve totaling \$73,825,000. A substantial exposure of acquisition, restoration and management investments would be at risk if projected development impacts were realized from the R-3 zoning.

Conclusion:

The existing residential development (Meadow Wood Subdivision, Units 1 and 2) located southwest of the Preserve has an apparent minimum lot size at 12,000 sq. ft./unit. The stormwater management system from this development discharges directly into the Preserve via a culvert under Klein Road. A rather septic smell caused the District to request testing of the water in the fall of 2006. Chemical tests performed through DuPage County Department of Public Health on grab samples from this drainage network revealed fecal coliform counts above 100,000/100ml. This count is markedly above the IEPA "not to exceed" geometric mean standard of 200/100ml. High fecal coliform counts that are more attributable to casual animal waste contamination

would have count levels likely around 3,000/100ml. As such, these count data are a probable indicator of a septic system failure that is seeping beyond design filtering capacity and flowing through the ground water into a storm sewer system entering the Preserve. This demonstrates that beyond engineered designs and regulating ordinances, ecosystem protections can be compromised as built systems fail or do not perform at designed and/or construction standards..

Ecologists at the District have become increasingly aware that preserving and protecting the District's natural resources contained within in preserves is clearly dependent on intensity and magnitude of negative stressors occurring outside the preserve system. Habitat fragmentation, changes in hydrology, invasive species, wildlife imbalances, and fire suppression all cause significant negative pressures on ecosystems within preserves. All of these stressors are a result of urbanization pressures beyond what ecologists would call the "carrying capacity" for a landscape. This means there can exist a limit or "capacity" of urbanization development that can be built on a landscape and yet achieve a balance with a certain functional health level and sustainability of a specific natural area. Beyond that limit, the natural area can no longer remain functionally viable and "carry" on health sustaining processes.

Changing the zoning on the Subject Property to a potential fourfold increase in development density is a clear example of designing an urbanization system that is likely beyond the "carrying capacity" of the landscape's physical and biological resiliency to sustain the present health of certain natural areas within the Preserve. If these changes in zoning are realized into higher density developments as described, degradation and/or failures within the Preserve's more sensitive natural area systems would become imminent.

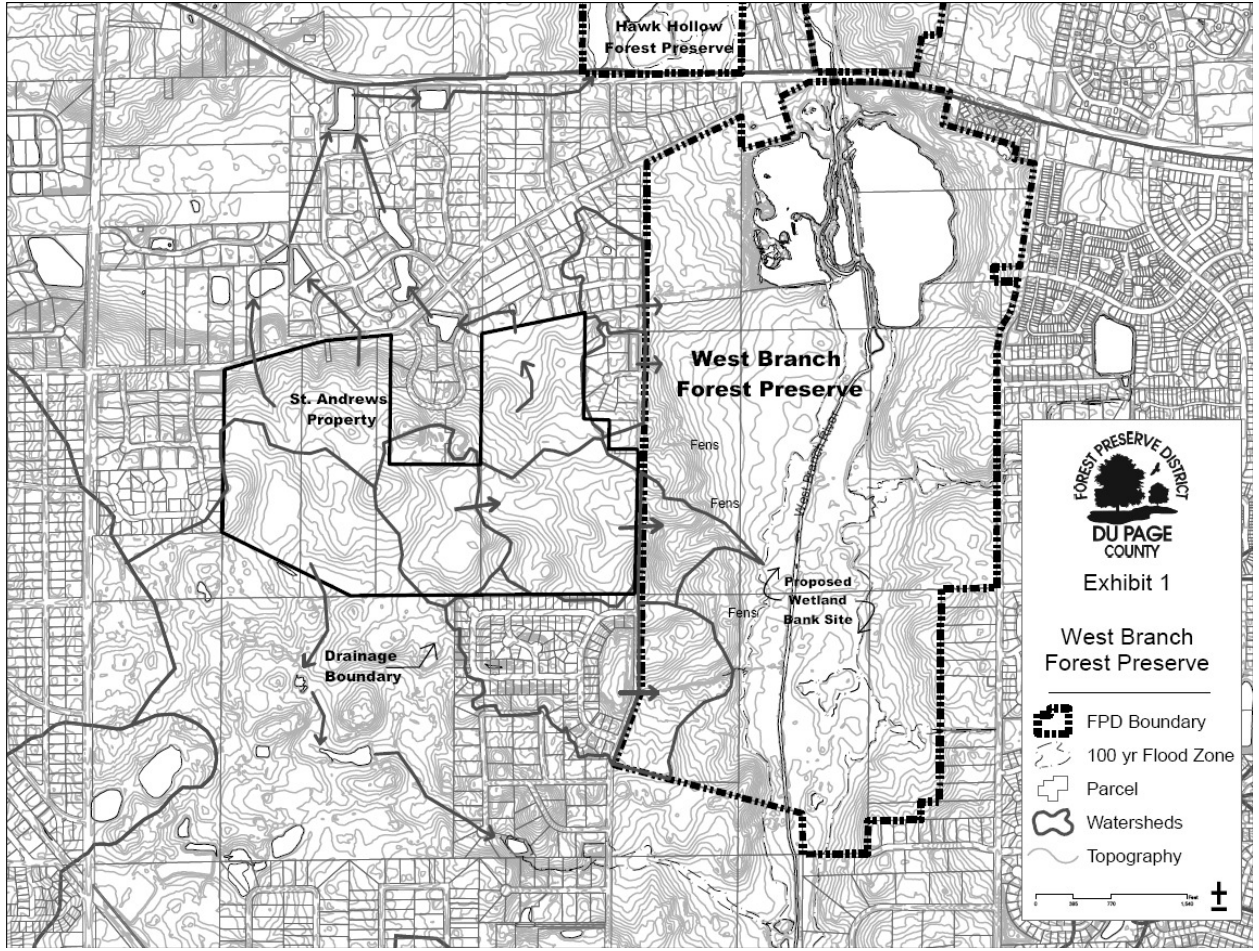
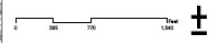
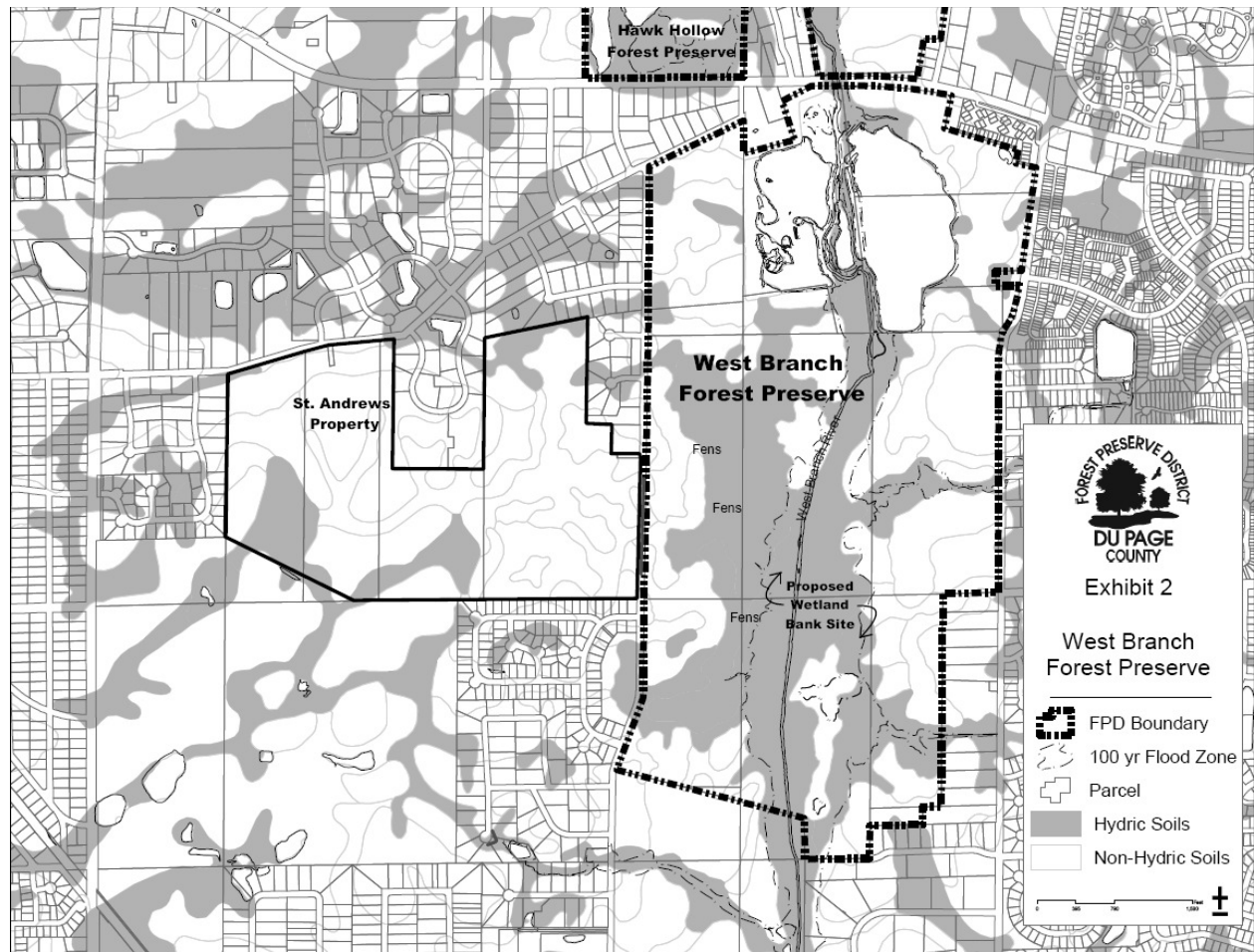


Exhibit 1

West Branch Forest Preserve

- FPD Boundary
- 100 yr Flood Zone
- Parcel
- Watersheds
- Topography





Appendix C

Graminoid Fens of the Northeastern Illinois

Chicago Wilderness Findings and priorities (*Biodiversity Recovery Plan*)

All types of wetlands in the Chicago Wilderness region have declined in quantity and quality. Conservation of the remaining examples, restoration of degraded sites, and creation of new wetland areas are priority activities within Chicago Wilderness due to the high value of these communities both for species diversity and for ecological processes of functional value to people.

Fens

Fens in general have high overall diversity as well as distinctive plant communities, and they are of high biological importance to the region. Priority plant species dependent on fens include marsh valerian, a candidate for federal listing, American burnet, and queen of the prairie.

Although there are more graminoid fens than other types of fen, they are being lost at an alarming rate. Unprotected graminoid fens have been identified recently, and experts think more are still to be discovered in the region, although their condition is likely declining. Hydrological changes, invasive species, and cattle grazing threaten graminoid fens. Although the full effects of these threats have not been seen yet, there is a high potential for further degradation of the graminoid fens. In general, graminoid fens are in poorer condition than calcareous floating mats and, of the fens, are the most sensitive to groundwater changes.

The reptile and amphibian assemblage of sedge meadow, fen, and dolomite prairie includes western chorus frog, green frog, northern leopard frog, pickerel frog, Blanding's turtle, smooth green snake, northern water snake, and queen snake. This assemblage in the region is considered to be globally important. Across the region, this assemblage is declining, although there is a north/south division. In the northern part of the region (Lake and McHenry Counties in Illinois), the assemblage is doing better, perhaps even increasing, due to management and protection. In the southern part of the region, the species that are specialists are declining, with only a few species hanging on. This is primarily due to fragmentation and isolation. Purple loosestrife poses a threat to these species over time. The fen insects are of conservation concern with many rare species. Sensitive species, which are rare and habitat restricted, include Baltimore checkerspot, swamp metalmark, and bluebell dragonfly. Hydrological alteration and invasion by common reed and cattail threaten fen insects.

Graminoid fens are in the first tier of priority for additional conservation action, due to their rarity, degraded condition, and the global significance of the remaining examples in the Chicago Wilderness region.

WETLAND COMMUNITIES

Conservation targets in top tiers (CW)

First (highest) tier

Graminoid fen, Panne

Second tier

Basin marsh, Calcareous floating mat, Calcareous seep, Streamside marsh

Third tier

Forested fen, Sedge meadow

Forest Preserve District of DuPage County Findings

Fens

Fens, which are pre-settlement wetland communities, are created and maintained by the continuous internal flow of mineralized groundwater emanating from bordering upland calcareous sand and gravel glacial outwash formations. An impervious layer of till below the outwash gravel lenses forces cold, oxygen-deficient, mineralized groundwater to seep laterally at the bases of upland slopes. Fens can take several topographic forms. They can be perched (on a terrace), hanging (on a steep slope) or on calcareous flats such as in prairies or over dolomite. Peat enriched with magnesium and calcium carbonates form the fen substrate, which supports many calcophilic plants adapted to high concentrations of dissolved alkaline minerals (as high as 3000 ppm). Fens are often found in association with strongly calcareous spring runs as well as natural communities such as calcareous seeps, sedge meadows, and marshes.

Present Status (FPDDC)

Most fens in DuPage County today are small and suffer from degradation due to hydrological changes and invasion by adventive species, such as *Rhamnus cathartica* (Common Buckthorn) and *Phalaris arundinacea* (Reed Canary Grass).

Pre-settlement Distribution/Size

Fens were probably once a common floristic community in northeastern Illinois due to hydrologic conditions.

Dominant Plants (FPDDC)

Carex hystericina (Porcupine Sedge) and *C. stricta* (Common Tussock Sedge).

Characteristic Plants (FPDDC)

Forbs: *Angelica atropurpurea* (Great Angelica), *Aster puniceus firmus* (Shining Aster), , *Chelone glabra* (Turtlehead), *Cicuta bulbifera* (Bulblet-Bearing Water Hemlock), *Cirsium muticum* (Swamp Thistle), *Epilobium leptophyllum* (Fen Willow Herb), , *Lobelia kalmii* (Bog Lobelia), *Pedicularis lanceolata* (Swamp Betony), *Rumex orbiculatus* (Great Water Dock), *Solidago patula* (Swamp Goldenrod), *Stachys tenuifolia hispida* (Rough Hedge Nettle), *Symplocarpus foetidus* (Skunk Cabbage), and *Viola nephrophylla* (Northern Bog Violet).

Special Concern Plants that were known from DuPage Forest Preserves but have disappeared:

Carex leptalea (Slender Sedge)
Gentiana crinita (Fringed Gentian)
Parnassia glauca (Grass of Parnassus)

Special Concern Plants that are currently known from fens in DuPage Forest Preserves but are very restricted:

Juncus brachycephalus (Short-headed Rush)
Habenaria hyperborea huronensis (Northern Bog Orchid)
Solidago ohioensis (Ohio Goldenrod)

Species currently listed as E/T that grow in fens (or calcareous spring runs) that were known from DuPage County in the literature:

Calopogon tuberosus (Grass Pink)

Cypripedium calceolus parviflorum (Small Yellow Lady's Slipper)
Filipendula rubra (Queen of the Prairie)
Veronica americana (American Brooklime)

Species currently listed as E/T that grow in fens (or calcareous spring runs) that are known from northeastern Illinois but not DuPage County:

Cypripedium reginae (Showy Lady's Slipper)
Eleocharis rostellata (Wicket Spike Rush)
Galium labradoricum (Bog Bedstraw)
Helianthus giganteus (Tall Sunflower)
Mimulus glabratus fremontii (Yellow Monkey Flower)

Fen Dependant Lepidoptera and host plants: Butterflies (FPDDC)

Black Dash Skipper - Uptight sedge (*Carex stricta*), and possibly others

Dion Skipper - Various sedges including woolgrass (*Scirpus cyperinus*), hairy sedge (*Carex lacustris*), and shoreline sedge (*Carex hyalinolepis*)

Bronze Copper - Water dock (*Rumex orbiculatus*) and curled dock (*Rumex crispus*).

Acadian Hairstreak - Various willow species including black willow (*Salix nigra*) and silk willow (*Salix sericea*).

Baltimore Checkerspot – Turtlehead (*Chelone glabra*), hairy beardtongue (*Penstemon hirsutus*), English plantain (*Plantago lanceolata*), and false foxglove (*Aureolaria*).

Eyed Brown - Various sedges (*Carex stricta*, *C. lupulina*, *C. bromoides*, and *C. trichocarpa*) in the sedge family (*Cyperaceae* spp.).

Fen Dependant Lepidoptera and host plants: Moths (FPDDC)

Papaipema nelita – Wild golden glow (*Rudbeckia laciniata*)

Papaipema limpida - Ironweeds (*Vernonia*)

Examples

Schick Road Fen at Hawk Hollow FP (26 acres)

Elsen's Hill Fens at West DuPage Woods FP (1.2 acres)

North Fens at Warrenville Grove FP (1 acre)

West DuPage Fens at West DuPage Woods FP (39 Acres)

Tri-County Fen at James "Pate" Philip State Park (2 acres)

Springbrook Fen at Springbrook Prairie FP (8 acres)

Klein Road Fens South at West Branch FP (34 acres)