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Abstract

Chapter 7 of Kent County's Comprehensive Plan discusses various areas of importance and recommends general guidelines for protection of these areas. Included is discussions of the importance of the preservation of wetlands, beaches and shorelines, coastal areas, and stormwater managements, as well as information regarding more specific areas such as the Silver Lake Watershed.

Resource

Chapter 7 - 2002 Kent County Comprehensive Plan Update

CONSERVATION

"Protect critical natural resources areas from ill-advised development." One of the State's 10 Goals from the Cabinet Committee on State Planning Issues' Summary Report, April 1995

"Conservation of natural resources (particularly wetlands, floodplains, and watersheds) is critical in light of future growth and development. The Comprehensive Plan will make recommendations for the conservation, use, and protection of the County's vital natural resources (to include resource protection areas, open space, and greenways)." One of the Kent County Levy Court's Goals for the 1996 Comprehensive Plan Update, still valid in this 2002 Update.

Introduction

Much of the statutory responsibility for the conservation, use, and protection of the State's (and therefore, the County's) natural resources falls to the Department of Natural Resources and Environmental Control (DNREC). DNREC is responsible for protecting public health; protecting air, land, and water; fish and wildlife management; and enhancing recreational opportunities for the citizens of Delaware. Information contained in this element of the Comprehensive Plan Update has been excerpted (unless otherwise noted) from a DNREC

document entitled, "Shaping Delaware's Future in Providing Goals, Regulatory Authorities, and Quantities of Natural Resources in Developing Performance Partnerships with the State's Counties," dated March 27, 1996. It should be noted that there is no single document that thoroughly describes DNREC's activities, goals, and objectives.

In January 2001, DNREC submitted to Kent County many manuals and reports that provide very detailed analysis and study results from many different offices within the DNREC organization. There were 35 manuals/reports/studies submitted to Kent County for review. These submitted items represented Air & Waste Management; Fish & Wildlife; Office of the Secretary; Parks & Recreation; Soil & Water Conservation and Water Resources. Kent County has tried to annotate in this update, those issues pertinent to land use decision-making in Kent County.

As with the other chapters within this Comprehensive Plan Update, the reader can go to <http://www.dnrec.state.de.us/dnrec2000/> to get on-line information about DNREC and all their programs.

Wetlands

Wetlands are significant in that they are at the foundations of estuarine productivity. Tidal wetlands contain a combination of salt and fresh water, and with non-tidal wetlands, are among the world's most productive systems in terms of total organic material produced. Wetlands provide an array of function including surface water storage, wildlife habitat, natural storm water management and the purification of ground and surface water. In the mid-1990's, the State of Delaware produced an updated and more detailed inventory of wetlands using 1993 aerial photography. The U.S. Fish and Wildlife Service conducted another status and trends study in 1998/99 by identifying wetland losses, gains, and changes in type by comparing 1981/82 aerial photographs to 1992 photos. This later study indicated that nearly 2000 acres of vegetated wetlands over the tax-year period were destroyed in the State of which most were forested wetlands. About 106 estuarine wetlands were converted to other uses. The losses of wetland acreage and wetland degradation historically, and in the recent past, have contributed to habitat loss and to the degradation of surface water quality from nonpoint source sediment and nutrient loading.

Additionally, freshwater wetlands are critical for maintaining the diversity of plant life found in the state. Fifty-three percent of rare plants are found in wetlands, and 84 percent inhabit nontidal wetlands. Kent County has large acreages of both types of these wetlands and is concerned about the losses. Kent County has a number of wetlands that currently are not adequately protected under current federal and state laws and may need additional protection under County ordinances. Unfortunately, most wetlands in Kent County are being degraded due to landscape alterations done primarily during the construction phase of subdivisions. These alterations result in the loss of critical habitat and natural vegetation and change how the landscape handles surface water runoff.

According to the *Updated Delaware Coastal Management Program*, published May 1999, there were approximately 122,000 acres (or 32% of the County's total land acreage) of tidal

and non-tidal wetlands in Kent County. Both non-tidal inland and coastal wetland habitats are an essential link to maintaining important fish and wildlife populations that are taken commercially and recreationally from the marshes, estuaries, and offshore waters.

Beaches and Shoreline

Barrier beaches are narrow strips of land made up of unconsolidated material extending parallel to the coast and often separated from the mainland by a body of fresh, brackish, or salt water; or a marsh. Some of the beaches occur on Pleistocene age highlands, which outcrop along the coast; such beaches exist at Bowers. The County's sandy beaches occur intermittently from Woodland Beach to Bowers and continuously from there along the Bay to the Sussex County boundary. These beaches are high-energy systems, with constantly shifting equilibriums that are subject to landward migration of the shoreline and coastal storm events. Beaches provide protection to buildings and infrastructure during damaging storms.

Coastal Waters

Most of Delaware is near coastal waters, and no part of the State is farther than eight miles from tidal water. Delaware coastal waters comprise part of the Delaware Bay Sub-basin, one of the more productive fisheries in North America. Delaware coastal waters support approximately 138 species of fish and provide spawning and nursery grounds for more than 60 of these species. Kent County contains 20 tidal river systems that support 19 commercially important fin fish and provide spawning and nursery grounds for approximately 40 fish species. In addition, nearly all of Delaware's oysters and 50 percent of blue crabs are landed in Kent County. Maritime commerce in the Delaware Bay is substantial. In 1989, there were more than 78,000 trips between Philadelphia and the Atlantic Ocean. These ships moved more than 107 million tons of goods, including 64 million tons of crude oil and more than 29 million tons of other petroleum products. Municipalities and industries use coastal waters for wastewater discharge. The generally large volumes of coastal waters, as well as their typically good flushing characteristics, enable the resource to assimilate a large quantity of treated wastewater. The extent of recreational use of coastal waters indicates still another significant feature of this resource, namely its aesthetics. Indeed, the natural beauty of the coastal waters was noted more often by early explorers and settlers than its utilitarian values.

Subaqueous Lands and the Coastal Zone

Subaqueous lands refer to those lands that lie below the high tide line. Subaqueous lands overlap the Coastal Zone, which is the strip of land and water located between the State's seaward territorial limits and a landward boundary. In Kent County, the western boundary of the Coastal Zone is State Route 9 to US 113 (south of Dover Air Force Base) to State Route 1 (north of Milford). A significant portion of the County's tidal wetlands; all of the beaches; four State Wildlife Areas (Woodland Beach, Little Creek, Ted Harvey, and Milford Neck); the Bombay Hook National Wildlife Refuge; fish and shellfish spawning and nursery areas; a substantial number of historic and archaeological sites, and significant natural areas

identified by the Delaware Nature Society are located in the Coastal Zone. The use of land and water in the Coastal Zone may impact any or all of these resources and the uses (recreation, tourism, fishing, etc.) they support.

Natural Areas

Natural areas are usually of aesthetic value, places of beauty. They may include the habitat for rare or endangered plants and animals, or they may be cherished by geologists or archaeologists as irreplaceable evidence of Earth's development and past civilizations. Such areas are irreplaceable as laboratories for scientific research; as reservoirs of natural materials (not all the uses of which are known); as habitats for plant and animal species and biotic communities whose diversity enriches the meaning and enjoyment of human life; as living museums where people may observe natural biotic and environmental systems of the earth and the interdependence of all forms of life; and as reminders of the vital dependence of the health of the human community upon the health of the natural communities of which it is an inseparable part. Thus, if these areas are maintained in their natural state, Kent County citizens will retain their opportunities to maintain close contact with such living communities and environmental systems of the earth and to benefit from the scientific, educational, aesthetic, recreational, and cultural values possessed by such areas.

Flood Hazard Areas

Hazards due to flooding are generated by any one or a combination of natural phenomena and affect various geographic areas of the County in different ways. These phenomena are:

1. Overland runoff - Runoff from heavy precipitation is the primary cause of flood problems in large drainage basins with steep gradients. Development often changes runoff characteristics, increasing flood hazard and frequency downstream unless storm water runoff is detained or otherwise successfully managed.
2. Storm surge - In coastal areas, extremely high water elevations result from a combination of reduced atmospheric pressure, strong offshore winds, and astronomical tides associated with coastal storms. Practically all low-lying parts of coastal Kent County are susceptible to this type of flooding.
3. Coastal over wash - This phenomenon accompanies storm surge events and is the most damaging form of flooding along the beachfront of the Delaware Bay. Coastal over wash is caused by the combination of storm surge and wave energy, and is characterized by severe beach erosion and the breach of dunes or other protective structures.

The County is authorized, pursuant to local zoning powers, subdivision regulations, building codes, and any other applicable power vested in the County, to manage flood hazard areas in a manner consistent with the Federal Flood Insurance Program.

Woodlands

Woodlands have a variety of natural and cultural values, not all of which are readily apparent. The recreational values of woods for walking, camping, nature observation, and hunting are probably the most recognized. Many people appreciate the aesthetic value of woodlands. Depending on the season, area of woodland coverage, and tree sizes, density, species and variety of vegetation, woods can be places of great beauty, adding variety to a landscape. As a habitat for animals and birds, woodlands are essential for the survival of many species. The replenishment of the Earth's oxygen supply by woodlands through the process of photosynthesis is clearly an important process. Woodlands also improve atmospheric quality by removing dust and pollutants from the air, and controlling noise. Woodlands function as windbreaks and shade producers. A woodland canopy of limbs and leaves slows the downward fall of precipitation, reducing the force of its impact on the soil, the rate of surface water runoff, and the rate of erosion. Public and private interests must recognize that woodlands have economic, recreational, wildlife, water supply, and scenic values.

Fish and Wildlife

Delaware has an abundance of wild birds, fish, and fur bearing animals. The State is inhabited by approximately 40 species of waterfowl, 25 species of birds of prey, 160 species of songbirds, and 60 species of mammals. In addition, Delaware's waters are home for numerous species of freshwater and saltwater fish. The importance of habitat preservation is obvious. Activities that would destroy or even slightly alter habitats can upset the fragile ecosystem. Inland clearing for development eliminates wildlife cover causing many species to leave the area or perish. If an endangered animal or plant species can inhabit only a specific area, the preservation of that area is of much greater concern than other areas.

Air Quality

In 1970, Congress passed the Clean Air Act that authorized the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants shown to threaten human health and welfare. Standards based on human health and welfare criteria were set for six principal pollutants: ozone (O₃), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM₁₀), and lead (Pb). Sources of air pollution are often broken into two categories: stationary (includes power plants that burn fossil fuels, factories, boilers, furnaces, manufacturing plants, gasoline dispensing facilities, and other industrial facilities) and mobile (includes vehicles such as cars, trucks, boats, and aircraft). According to NAAQS, Kent County is a severe unattainment area for ozone, due mainly to mobile sources. The Clean Air Act Amendments of 1990 require the State to develop and implement State Implementation Plans (SIPs) to attain and maintain the NAAQS by specific dates. Growth and development should occur in conformity with the Clean Air Act and the SIPs.

In 1998, DNREC released, "The Delaware Phase II Attainment Demonstration for the Philadelphia-Wilmington-Trenton Ozone Non-attainment area." This document describes the non-attainment status of Kent County. The Clean Air Act Amendments (CAAA) of 1990 define five non-attainment classifications for the areas that exceed the NAAQS, based on the

severity of the pollution problem. They are, in order of severity, "marginal," "moderate," "serious," "severe," and "extreme." Kent County is classified as "severe," in non-attainment with the 1-hour ozone NAAQS. The Kent County area is classified as part of the Philadelphia Consolidated Metropolitan Statistical Area (CMSA), which has been named the Philadelphia-Wilmington-Trenton non-attainment area. Basically, the state and Kent County must develop strategies that could help get Kent County into "attainment." Federal funding for new transportation projects are jeopardized if various air models used by DNREC and DelDOT do not indicate our air quality improving. New automobile emission standards as well as vehicle trip lengths can help Kent County reach this goal. Kent County can help this process by legislating development criteria in the established growth zone and thereby, reducing the vehicle trip length for things such as grocery and other amenity stores. Air modeling indicates that if a majority of the new development projects occur near infrastructure and businesses (i.e. in the growth zone) it can have a positive effect on our current non-attainment status.

Stormwater Management and Erosion and Sediment Control

"Stormwater management" means: a) for water quantity control, a system of vegetative, structural, and other measures that may control the volume and rate of storm water runoff which may be caused by land disturbing activities or activities upon the land; and b) for water quality control, a system of vegetative, structural, and other measures that control adverse effects on water quality that may be caused by land disturbing activities or activities upon the land. "Erosion and sediment control" means the control of solid material, both mineral and organic, during a land disturbing activity, to prevent its transport out of the disturbed area by means of air, water, gravity, or ice. "Land disturbing activity" means a land change or construction activity for residential, commercial, silvicultural, industrial, and institutional land use which may result in soil erosion from water or wind, or movement of sediments or pollutants into State waters or onto lands in the State, or which may result in accelerated storm water runoff, including, but not limited to, clearing, grading, excavating, transporting, and filling of land.

Stormwater runoff may reasonably be expected to be a source of pollution to waters of the State and may add to existing flooding problems. The implementation of a statewide sediment and stormwater program is aimed at preventing existing water quantity and quality problems from becoming worse and, in some cases, may reduce existing problems. Sediment and stormwater approvals are required for land changes or construction activities for residential, commercial, silvicultural, industrial, or institutional land use, which are not exempted or waived by regulations, promulgated by DNREC and implemented by the Kent Conservation District. The Kent Conservation District, under an agreement between DNREC, the Levy Court, and the District, is responsible for sediment and stormwater management plan approval, inspection during construction, post construction inspection, and education and training.

The Silver Lake Watershed

The term "watershed" refers to a geographic area in which water, sediments, and dissolved materials drain to a common outlet: a point in a tributary or stream, a lake, an underlying aquifer, an estuary, or an ocean. This area is also called the "drainage basin" of the receiving water body. Silver Lake has a contributing drainage area of approximately 20,000 acres. The watershed extends beyond the City of Dover corporate limits into the County.

What occurs in the watershed will have an impact on Dover's Silver Lake. The impacts result from many different sources. Efforts to reduce those impacts must be comprehensive. The lake is fed by streams and drainage ways such as Fork Branch, Maidstone Run, McKee Run, Dove Creek, and Cahoon Branch. These tributaries convey water during base flow conditions and also function to convey stormwater during rainfall events. Water, including pollutants, is transported through this drainage network and is deposited in Silver Lake. The Dam and the approximately 160 acres of pooled water act as a sink to pollutants entering the lake. Pollutants, for the most part, do not travel through the lake downstream, but rather accumulate within the lake.

In "Options for the Protection and Improvement of Silver Lake," a discussion paper presenting various options for the Silver Lake Watershed, prepared by DNREC in conjunction with the City of Dover, Kent County and an Advisory Committee, a number of alternatives are proposed. The alternatives include:

- floodplain and riparian zone protection
- support for comprehensive plan updates
- pollution prevention through educational programs
- greenways - hiker/biker trails adjacent to the lake and its tributaries
- wetland restoration when land is developed
- establishing a Silver Lake Watershed Overlay to limit site imperviousness and to target nutrients on new developments
- conservation development
- sunset provisions for development

Lower St. Jones River Delaware National Estuarine Research Reserve (DNERR)

The 1999 Delaware National Estuarine Research Reserve, *Estuarine Profiles Report* describes the Lower St. Jones River DNERR Reserve as a 3,750-acre medium-salinity tidal river facility situated at the lower end of the St. Jones River watershed, with the river discharging into mid-Delaware Bay. The reserve contains 35 parcels of land held by 23 private landowners plus the DNERR and one other state agency. Within the designated boundaries of the lower St. Jones Reserve there are about 698.5 acres of tidal marshes, upland fields, woodlots, and croplands. 431.1 acres were purchased through fee-simple acquisitions and 267.2 are protected through conservation easements. The Ted Harvey Conservation Area (consisting of 2,019 acres) is adjacent to the Lower St. Jones Reserve and is owned and managed by DNREC's Division of Fish and Wildlife. The Division of Fish and Wildlife also owns and manages 176 acres of the Roberts Tract. The Delaware Division of Historical and Cultural Affairs owns and manages the John Dickinson Plantation and Mansion, which consists of

262.8 acres. The Lower St. Jones River Reserve is used as resource protection and conservation, estuarine research, and environmental education.

Biodiversity

In 1999, DNREC released a manual entitled, "Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation" authored by the Environmental Law Institute. More recently, DNREC published "Our Natural Legacy/; Delaware's Biodiversity Conservation Partnership" which contains priority actions developed through a comprehensive stakeholder process that was conducted after the 1999 report was published. These documents focus on how Delaware's legal, policy, and management tools can be improved and used to ensure that Delaware's future includes a vibrant economy, high quality of life, and rich biological resources. Biological diversity is the "variety of life and its processes" including "the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur." It focuses on conservation and restoration techniques for many types of landscape, native plant and animal species and the protection of healthy and diverse genetic stocks within species. One of the Key Policy recommendations listed in the Environmental Law Institute manual (there are 22 policy recommendations listed in this manual) relates to comprehensive plans and is annotated as follows:

"Amend existing county comprehensive plans to ensure that they are consistent with the state's development priorities. State designated growth and preservation areas are required by law to be reflected in comprehensive plans at the county level. Require counties to develop zoning maps that are in accord with their comprehensive plans. Areas designated as growth and preservation areas in the county comprehensive plans should be reflected as such in the zoning maps."

DNREC should be able to assist Kent County in identifying the many areas of concern as listed in this manual on biodiversity. This information must be available in order to analyze the most practicable means of protecting Kent County's biodiversity through potential land use measures. As with all environmental protection initiatives, the macro level approach must be used. For example, programs that purchase agricultural land, Open Space, and/or parkland can target lands containing the most bio-diverse communities. There should be a "master plan" of sorts drafted by the State with all parties involved that impact conservation of bio-diverse communities. Such a plan would discuss how these agencies could work together to fund the purchase of bio-diverse community lands.

Previous Environmental Friendly Land Use Zoning Amendments

Kent County Levy Court has enacted several environmental friendly zoning amendments since the *1991 Kent County Zoning Ordinance*. The Kent County Levy Court monitors new constraints on our environmental community and tries to enact ordinances that will further the environmental stewardship. Although there are few specific ordinances dealing only with environmental issues, many other zoning ordinances approved by Levy Court, contain some element of environmental stewardship. Some of these amendments include:

- a. Defines buildable area, setback area, setback, removes accessory building from rear yard and establishes setback for accessory buildings (11/11/92)
- b. Septage processing/storage as conditional use in A-C/A-R districts (6/14/94)
- c. Add AICUZ in subdivision ordinance (12/15/95)
- d. Sand and gravel pits without processing as conditional use in AC/AR (10/14/97)
- e. Expungement & Expiration of Recorded Subdivisions (10/28/97)
- f. Flood Plain boundary shall be shown on all recorded plans (4/14/98)
- g. Tower applications are to be accompanied by a professional engineer's report (1/11/00)
- h. Regulates sand and gravel and other quarrying operations (1/11/00)
- i. Airport Environs Zoning Overlay (9/20/00)

Delaware Cabinet Committee on State Planning Issues

In a June 15, 2000 letter to Kent County, the Delaware Cabinet Committee on State Planning Issues outlined several general principles and criteria that each of Delaware's three counties should consider during their Comprehensive Plan Update processes. As related to environment, this letter suggested counties: (1) account for and discuss the role that "Total Maximum Daily Loads" (TMDLs) will play in identifying, protecting and managing critical agricultural lands and natural resource areas; (2) fiscally sound wastewater facilities plans; (3) implications of land development on parks and recreation and protection of critical habitats; and (4) adopt overlay zoning to protect natural features and properties of ecological significance. These above referenced suggestions by the Cabinet Committee on State Planning Issues are being reviewed by the Kent County Levy Court. The Kent County Levy Court is the only entity empowered to change the County Land Use regulations. The recommendations at the end of this chapter include techniques to meet conservation related goals, some of which address the criteria outlined in the June 15, 2000 Cabinet Committee letter.

Comprehensive Plan Update Workshops

From September 2000 through November 2000, the Kent County Department of Planning Services conducted 12 workshops throughout the County. During each of these workshops, participants were asked to complete a survey on a variety of land use issues, some of which covered environmental related topics. The entire survey results can be found at http://www.smartmap.com/kent_co/comp_plan/survey.htm. From the 197 survey respondents, 114 thought conservation of natural resources extremely important; 60 thought it was important; 6 had no opinion; 4 thought it not important; and 1 thought conservation of natural resources not an issue. The following is a summary of the results:

Table 7.1 - Survey Results for Conservation

Extremely Important	Important	No Opinion	Not Important	Not An Issue
1	2	3	4	5

	1	2	3	4	5
a. Ground water (well) protection	149	31	3	2	0
b. Coastal Zone Protection	108	60	8	5	1
c. Clean air issues	111	53	14	4	1
d. Endangered species protection	64	111	24	18	11
e. Contaminated lands cleanup	99	66	10	6	3
f. Promoting bio-diversity issues and protection	83	67	17	9	0
g. Protection of forested habitat for hunting	65	70	22	22	8
h. Soil erosion filling Kent County streams	100	65	9	5	3
i. Leaking underground storage tanks	113	61	8	3	2
j. Failing septic systems contaminating ground water	122	50	8	2	3

To assist Kent County with techniques in environmental protection, the Delaware Department of Natural Resources and Environmental Control (DNREC) submitted many manuals and reports that provide very detailed analysis and study results from many different offices within the DNREC organization. There were 35 manuals/reports/studies submitted to Kent County for review. These submitted items represented Air & Waste Management; Fish & Wildlife; Office of the Secretary; Parks & Recreation; Soil & Water Conservation and Water Resources. Kent County has tried to annotate in this update those issues pertinent to land use decision-making in Kent County. The following is a list of submitted topics of interest regarding land use and environmental issues in Kent County:

1. Total Maximum Daily Load (TMDL) for the Murderkill River;
2. Need for a “208- like” wastewater facilities plan;
3. Protection and utilization of ground water supplies;
4. National Ambient Air Quality Standards (NAAQS) issues;
5. Industrial emissions issues such as stationary source, hazardous air pollutants, and greenhouse gases;
6. Recreation and Open Space programs to include: Open Space; Land and Water Conservation Trust Fund; Conservation Easement Program; and Natural Areas Program;
7. Policy to discourage new development in all rural areas;
8. 1,000 foot buffer around streams, wetlands, and threatened/endangered species sites in the “community”, “Developing Areas”, and “Secondary Developing Areas” as depicted on the Delaware State Investment Strategy Map.

Recommendations

As previously stated in other chapters of this Comprehensive Plan Update, the Levy Court is the only legislative body empowered to make land use decisions in Kent County. The Levy Court has seriously considered all “practicable” suggestions annotated by DNREC regarding this Comprehensive Plan Update. The following recommendations reflect Kent County’s good faith effort to incorporate all practicable suggestions into future actions that will enhance Kent County’s sound environmental stewardship in land use decisions and policies.

- Consider revisions to zoning and subdivision ordinances to further protect wetlands, natural areas, flood hazard areas, woodlands, riparian areas, forest corridors, and watersheds (possibly through the use of performance measures and overlays).
- Continue to work with DNREC, Department of Agriculture, and the Kent Conservation District for the conservation and protection of environmentally sensitive areas.
- Review and incorporate where practicable, Zoning Overlay Maps and Ordinances requiring specific building and development measures to protect environmentally sensitive and bio-diverse areas of Kent County. This would add environmental protection provisions and “best management” practices into our zoning code.
- Solicit DNREC to provide Kent County specific data that could be used in the development of Overlay Maps and Ordinances. Data to include but not be limited to: number, amount, and types of open space, forests, water bodies, endangered/threatened species, wetlands, and coastal areas.
- Review an ordinance to require a Conditional Use with site plan approval for major subdivisions located outside the growth zone.
- Encourage new subdivisions within the growth zone with higher density rewards while limiting subdivisions outside the growth zone through conditional uses.
- Ensure that a wide selection of public recreational facilities and programs are provided to meet the varying needs of all County residents within all zoning districts.

Source: Kent County Comprehensive Plan Update, Chapter 7 “Conservation” available at: http://www.smartmap.com/kent_co/comp_plan/chapter_7.htm