



NATURAL RESOURCES

FLOODPLAINS



## FLOODPLAINS

Torrential rains resulting from hurricanes, heavy rainfall mixed with snow melt (Figure 1), and prolonged rainstorms, are just some of the conditions that set the stage for flooding in the County. In 1972, Centre County's communities suffered extensive damage from Hurricane Agnes. In 1996, heavy rainfall and snow melt turned streets into rivers and displaced residents from their homes. These are just two examples why management of flood-prone areas is a critical component of long-range planning.<sup>1</sup>



Figure 1: Heavy rain combined with melting snow caused flooding in the Village of Spring Mills in January 1996. Photo: *Centre Daily Times*, January 20, 1996 edition

### Flooding

Flooding naturally occurs in floodplain areas which are the lands adjacent to the stream. Floodways encompass the stream channel and the land area to the top of the stream bank. The land area outside of the floodway is the flood fringe. (See Figure 2: Floodplain Schematic)

The basis for regulating floodplains is the 100-year flood. A 100-year flood is defined as an area of land that has a one-percent chance of flooding in any given year.

<sup>1</sup> *Administering Floodplain Management Regulations, A Handbook for Local Permit Officials*, Commonwealth of Pennsylvania, Department of Community Affairs, December 1990

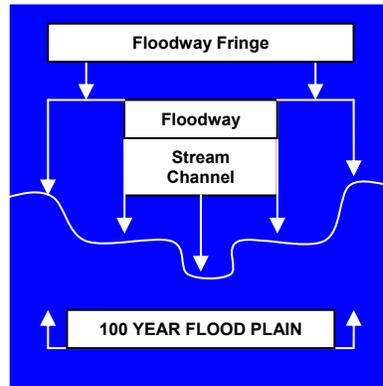


Figure 2: Floodplain Schematic

### Mapping of Floodplains

Floodplains are mapped using several methods; however, the two most common for Centre County are the delineation of floodplains using U. S. Soil Conservation Service's (now referred to as the US Natural Resources Conservation Service) Soils Map and Flood Insurance Rate Maps (FIRM) from the Federal Emergency Management Agency (FEMA).

Floodplain soils or hydric soils are those that occur in floodplains, have a high flooding hazard and are not suitable for sub-surface sewage disposal systems. FEMA maps are based on hydrologic and hydraulic analysis conducted by FEMA as well as historical data. The map in Appendix 1 shows the floodplain areas and soils in Centre County.

### Floodplains-Developed and Natural

Historically, communities were built near water because water was essential to the day-to-day life of the inhabitants. Some of that development occurred in the floodplain. The Village of Spring Mills is an example of this whereby the town's early development (1790s) began with the erection of a sawmill and a grist mill. In 1877, the railroad was extended from Mifflinburg to Spring Mills. Both of these events spurred development in this Village which is situated at the confluence of Penns and Sinking Creeks. The photograph in Figure 1 graphically portrays the disastrous outcome of developing in flood-prone areas. Figure 3 also illustrates why development in floodplains is hazardous.

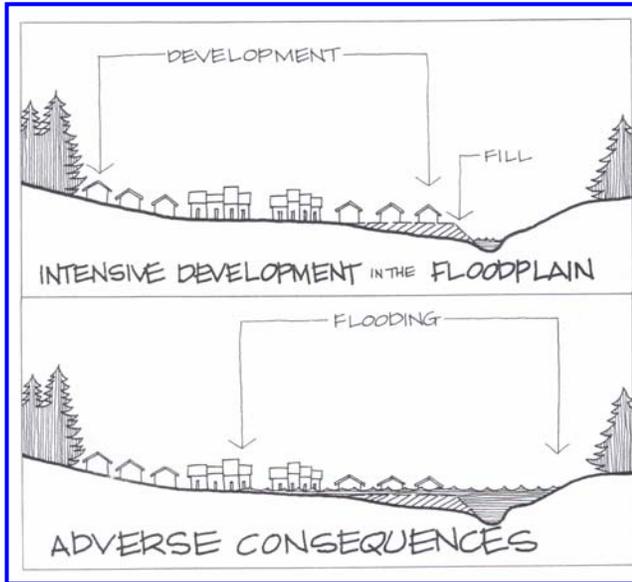


Figure 3: Floodplain Development (above) and Adverse Consequences of Floodplain Development (below) (Source: *Directions for the Future: Guidelines for Decision Making*, 1979)

Developing these areas poses a risk to human life, property and downstream communities.

Today, the trend is to prohibit or strictly regulate new development in floodplains as a preventive measure and in recognition of the natural functions of floodplains listed in Figure 4.

#### NATURAL FUNCTIONS OF FLOODPLAINS

- ❑ Limit flooding naturally, by temporarily storing flood waters
- ❑ Maintain water quality by filtering sediments, nutrients, and impurities
- ❑ Preserve groundwater recharge
- ❑ Support natural vegetation
- ❑ Provide fish and wildlife habitat
- ❑ Provide many kinds of recreational opportunities
- ❑ Provide places for outdoor education and scientific study

Figure 4: Natural Functions of Floodplains, *Addressing Your Community's Flood Problems, A Guide for Elected Officials*, Federal Interagency Floodplain Management Task Force, 1996

Until only recently have we as a society begun to appreciate the role of floodplains. The functions listed in Figure 4 are becoming more critical in Centre County in terms of floodwater storage, groundwater recharge, and filtration capabilities. Another natural advantage is that floodplain soils are often associated with prime agricultural land. Deposits of rich alluvial<sup>2</sup> silt from past flooding have become productive farmland.

Floodplains need to be thought of as a natural part of a watershed<sup>3</sup> since land use activity in the watershed is directly related to a floodplain's ability to manage flood waters. A comprehensive approach to land use planning and floodplain management is necessary in order to protect the health, safety and general welfare of the County's residents and their property in flood-prone communities as well as the natural eco-system of the floodplain. These protections are provided for in the Purpose (105) and Preparation of Comprehensive Plans (301.a.6) Sections of *Pennsylvania Municipalities Planning Code*.

#### Floodplain Regulations

In 1968, Congress passed the National Flood Insurance Act which created the National Flood Insurance Program. The intent was 1) to provide property owners with the opportunity to obtain flood insurance and 2) to require the regulation of new development in flood-prone areas.

<sup>2</sup> Alluvial Soil is a soil formed from material such as gravel, sand, silt or clay deposited by a flowing stream of water. (Source: *Soil Interpretation for Area Development, Volume 1, Centre County, Pennsylvania*, January 1968)

<sup>3</sup> A land area, also known as a drainage area, which collects precipitation and contributes runoff to a receiving body of water or point along a watercourse. *A Glossary of Zoning, Development and Planning Terms*, American Planning Association, Planning Advisory Series 491/491, December 1999

Communities must become National Flood Insurance Program participants in order for property owners to be eligible to purchase flood insurance. Program participation involves adoption of minimum regulations that meet floodplain management requirements established by the Federal Emergency Management Agency (FEMA). These regulations specifically address new development in areas identified by FEMA as being flood-prone. Flood insurance may be obtained through local insurance agents.

Ten years after the adoption of the Federal Act, the General Assembly of Pennsylvania enacted the Pennsylvania Flood Plain Management Act (Act 166).

Major provisions of the Act include:

- ✓ Requiring municipalities identified by FEMA to participate in the National Flood Insurance Program (NFIP);
- ✓ Requiring municipalities to incorporate minimum requirements of the Pennsylvania Flood Plain Management Act for development in addition to the floodplain management requirements of the National Flood Insurance Program; and,
- ✓ Reimbursing municipalities for up to 50 percent of the eligible expenses incurred in the preparation, enactment, administration and enforcement of floodplain management regulations necessary to comply with the requirements of the NFIP and Act 166.<sup>4</sup>

The Commonwealth developed suggested provisions for meeting the minimum requirements of both the Federal and state laws. These provisions are not meant to serve as a model ordinance for municipal adoption, but instead as suggestions for tailoring regulations for a municipality's flood-prone area(s). Floodplain regulations may be incorporated into a zoning, subdivision and land development, building code or stand-alone ordinance.

Regulating floodplain management varies throughout the County. In general, the Centre Region municipalities' floodplain maps are

<sup>4</sup> *Administering Floodplain Management Regulations, A Handbook for Local Permit Officials*, Pennsylvania Department of Community Affairs, December 1990

based on hydric soils, and the regulations do not permit any type of development in the floodplain. Municipalities outside of the Centre Region rely on the Flood Insurance Rate Maps (FIRM) for the delineation of their flood-prone areas and regulate floodplain development as allowed for in the minimum requirements.

Currently, the Centre County Conservation District is participating in the Pennsylvania Department of Community and Economic Development's Flood Monitoring Program. The District's primary responsibility is to review the municipal floodplain ordinances and administrative procedures. The intent of the review is to make certain that the minimum requirements as established by the state and Federal governments are being met.

Through this review, the most common problem identified was property owners filling in floodplain areas without going through the municipal permit process. Educating property owners on proper floodplain management is key to keeping these drainage ways functioning properly.

#### Floodplain Management-Developed Area

New development in a floodplain should be discouraged; however, any development that does occur in floodplain areas must first satisfy permit requirements at the local, state and Federal levels. Second, the development must be built so that the lowest level is at or above the 100 year flood elevation. Raising the elevation may be accomplished by using fill material or

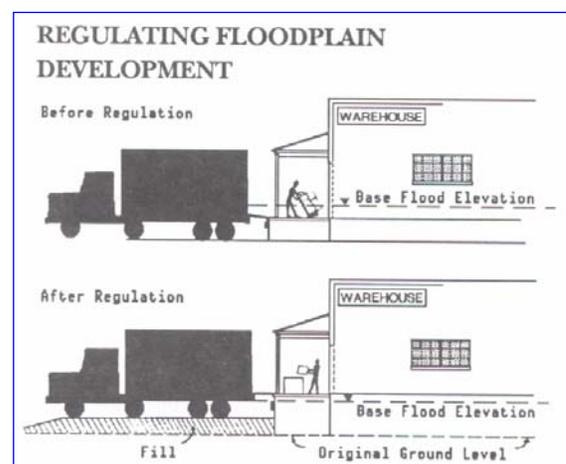


Figure 5: Regulating Floodplain Development (Source: *Administering Floodplain Management*)

*Regulations: A Handbook for Local Permit Officials*, Pennsylvania Department of Community Affairs, December 1996) elevating the structure by using concrete blocks, wood posts or by other methods. Figure 5 illustrates standards for floodplain development.

Another consideration for developing in a floodplain is suitability of soils for on-lot septic systems. Section 73.12 of the Pennsylvania Department of Environmental Protection's regulations prohibit the issuance of sewage permits within identified floodways, on floodplains or in flood-prone soils since on-lot systems cannot be flood-proofed.<sup>5</sup> This prohibition significantly limits the type of development that can occur in the floodplain.

Preventive measures for managing developed floodplains include relocation and acquisition of flood-prone properties. Public monies utilized for this purpose may be well worth the investment. Removing structures from the flood-prone areas reduces the flood-risk factor and also improves the stream's capacity to store flood waters. Parks and recreation areas are an excellent re-use of a publicly acquired flood-prone property.

#### Floodplain Management-Natural Area

Floodplains in their natural state maintain the integrity of a floodplain's function as noted in Figure 4. This eco-system can be enhanced by the establishment of riparian<sup>6</sup> buffers. Banks with vegetative buffers lessen the thermal impact of stormwater runoff, filter pollutants, and reduce erosion of stream banks as well as providing habitat for aquatic and terrestrial life.

Criteria recommended for establishing buffers vary depending on the setting. Urban (Figure 6), suburban, forest and agriculture buffers all differ

<sup>5</sup> Ibid

<sup>6</sup> Riparian is defined as the land area which borders a stream or river and which directly affects and is affected by the water quality. This land area often coincides with the maximum water surface elevation of the 100 year storm. (Source: *Better Site Design: A Handbook for Changing Development Rules in Your Community*, Center for Watershed Protection, August 1998

somewhat in terms of buffer widths. The width of a buffer should be set based on the intensity and type of the adjacent land use. The first Table in Appendix 2 provides recommended minimum and ideal buffer for different settings. Figure 6 is an illustration of the recommended widths for urban/developed areas.

This criteria may also vary depending on the buffers function. The Tables in Appendix 2 provide recommended buffer widths for both settings and functions which can be used as a basis for planning and regulations.

For example, establishing green corridors along streams as recommended in the Spring Creek River Conservation Plan (Appendix 3) with the cooperation of landowners is an effective floodplain management strategy that is also protective of the health of a waterways eco-system.

Other techniques for maintaining floodplains in their natural state include:

✓ **Stream Corridor Overlay Zoning Districts** which provide for buffer areas and may control the percentage of any allowable impervious coverage as well as permitted uses.

✓ **Conservation Design Subdivision/Land Development and Zoning Regulations** which provide for clustering of development and a required percentage of open space. This technique may be used to protect environmentally constrained areas, i.e., floodplains, wetlands, and steep slopes by deducting the environmentally sensitive areas from the amount of land to be developed on a site.

✓ **Streambank fencing and livestock crossings in agricultural areas** which create a vegetative buffer improving water quality by reducing soil erosion and nutrient deposition caused by livestock.

✓ **Conservation easements** which protect the land and its important features from inappropriate development while retaining private ownership of the property.

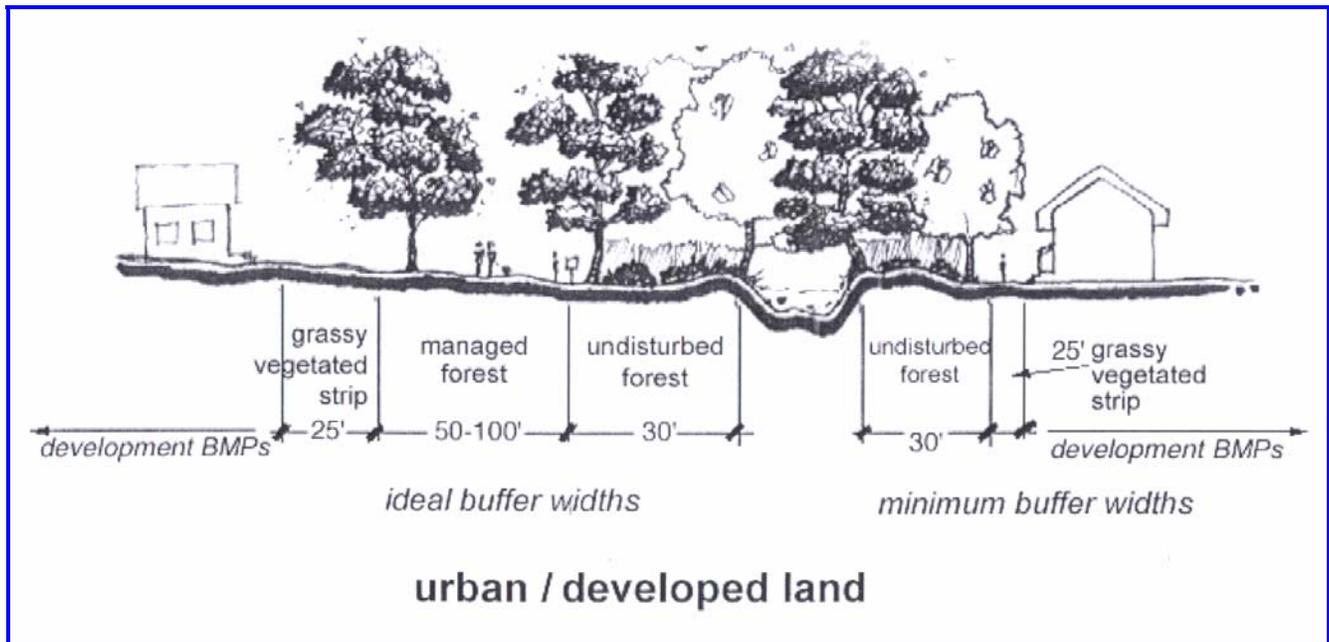


Figure 6: Recommended Buffer Widths for Urban/Developed Land (Source: Spring Creek River Conservation Plan, a project of the ClearWater Conservancy)

### Threats to Floodplains

Development in close proximity to a floodplain increases the incidence of sediment and pollutant loading in the flood fringe and floodway. Establishing riparian buffers protects floodplains from the negative impacts of both erosion, sedimentation, and pollutants.

Invasive species are another threat to floodplains choking out the native plants which reduces wildlife diversity in the floodplain area and associated wetlands. Management of invasive species is difficult. It is thought that the only hope we have for eliminating invasive species is through eventual evolution of natural disease and predators.

Property owners should be advised not to plant these species as part of residential and commercial landscapes. Invasive species that are a threat to Pennsylvania's waterways include: Japanese knotweed, mile-a-minute weed, purple loosestrife, common privet, moneywort and Japanese stilt grass.<sup>7</sup>

### Conclusion

Floodplain management is a critical component of land use planning. The potential for the loss of property as well as human life is not worth the risk posed by lack of planning and improper administration of local, state and Federal floodplain regulations.

Protecting the eco-systems of the floodplains as well as their capacity to store floodwater should be a priority. In order to do so, the floodplain environment should be maintained in its natural state or put to a compatible use such as agriculture, parks and other non-structural recreational uses, and wildlife areas. Development in a floodplain should be discouraged.

<sup>7</sup> Greg Podniesinski and Jeff Wagner, "Development, invasive plants threaten Pennsylvania

floodplains", Keystone WILD! Notes, Summer-Fall 2002 p.6

## NATURAL RESOURCES GOAL

Identify, preserve, **enhance** and monitor Centre County's environmental natural resources for the benefit of present and future generations.

### OBJECTIVES-Floodplain

Promote the wise use and management of the County's natural resources that include prime agricultural lands, forested areas, and mineral resources.

Protect watershed features such as surface and underground water supplies, streams, floodplains, wetlands, fish and wildlife habitats, and aquifer recharge areas.

### RECOMMENDATIONS

Protect floodplains within Centre County from inappropriate development.

Promote wise management of existing development in floodplains.

Modify the Centre County Subdivision and Land Development Ordinance to include conservation design techniques.

Update the County's Floodplain Map for Centre County using aerial photography and GIS.

Promote stream corridor management techniques, i.e., riparian buffers, stream bank fencing, and stream corridor overlay districts.

Explore opportunities to protect floodplains through the implementation of the Spring Creek River Conservation Plan, the Nittany and Bald Eagle Valleys Greenway/Bikeway Project and the Centre County Conservation District's participation in Pennsylvania's Floodplain Monitoring Program.

Encourage Centre County municipalities to:

- Adopt stream corridor overlay districts.
- Incorporate the establishment of riparian buffers into local floodplain regulations.
- Prohibit development in the 100-year floodplain.
- Consider designating public-owned land in a floodplain for a recreational use.
- Work with Centre County's land trusts to acquire conservation easements for floodplains that are environmentally sensitive.
- Prohibit plantings of invasive plant species by property owners.
- Modify local regulations to include conservation design and net-loss provisions.
- Explore opportunities to protect floodplains through the implementation of the Spring Creek River Conservation Plan, the Nittany and Bald Eagle Valleys Greenway/Bikeway Project and the Centre County Conservation District's participation in Pennsylvania's Floodplain Monitoring Program.



# NATURAL RESOURCES

## WETLANDS



## **WETLANDS**

Wetland communities in Centre County are found inland in floodplain, riparian and forested areas. These wetlands support very diverse

plant and wildlife communities including endangered species and play an important role in the eco-systems of the County. Other significant functions of wetlands include flood and erosion control, water quality improvement, aquifer recharge and breeding grounds for fish and wildlife.

Planning for the protection of these fragile, natural systems and their functions needs to be an integral part of the County's and municipal government's growth management strategies. These protections are provided for in Section 301.a.6 of the *Pennsylvania Municipalities Planning Code* which requires comprehensive plans to include "A plan for the protection of natural and historic resources to the extent not preempted by federal or state law. This clause includes, but is not limited to, wetlands..."

### **Wetlands Defined**

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence or vegetation typically adapted for life in saturated soil conditions.<sup>8</sup> They consist of marshes, bogs, swamps, and shallow zones of rivers and ponds.<sup>9</sup>

There are two general categories of wetlands in the United States which are coastal wetlands (influenced by ocean tides) and non-tidal inland wetlands. Centre County contains inland wetlands.

Wetlands are categorized into different types which are based on the vegetative make-up of the community. In Pennsylvania, these types include:

***Forested Wetlands***-These are wet habitats where woody trees (over 20 feet in height), such as red or silver maple, river birch, blackgum and green ash find a home. Nearly 221,000 acres of the state's wetlands are forested wetlands.

***Scrub-shrub Wetlands***- These wetlands are inhabited by spicebush, swamp honeysuckle, highbush blueberry, winterberry, alder and willows, to name a few. This type of wetland is also dominated by small trees less than 20 feet in height. Nearly 139,000 acres of Pennsylvania's wetlands are shrub communities.

***Emergent wetlands***- Wetlands that are vegetated by grasses, sedges, rushes and other herbaceous plants that emerge from the water or soil surface. Emerged wetlands are only one-third as abundant as forested wetlands and only one-half as common as the scrub-shrub types. About 14 percent of Pennsylvania wetlands are emergent wetlands.<sup>10</sup>

In comparison to other landscapes, wetlands are relatively young and dynamic. They tend to be unstable and change with rainfall and vegetation patterns.<sup>11</sup>

### **Wetlands in Centre County**

In 1990, a study of wetlands was conducted by the Centre County Planning Office. At that time, it was determined that less than 1% (6,465 acres) of the County's 713,645 acres were wetlands. It is important to note that wetlands data collected at the Federal and state level is not broken down per County except for data collection that is project specific.

<sup>8</sup> US Army Corps of Engineers-Baltimore District, *Recognizing Wetlands*, 1997

<sup>9</sup> David G. Burke; Hazel Gromm; Erik J. Meyers, Ralph W. Tirer Jr., *Protecting National Wetlands*, APA Press 1988

<sup>10</sup> *An Introduction to Wetlands*, Commonwealth of Pennsylvania, Department of Environmental Protection, February 2001

<sup>11</sup> Edward Maltby, *Waterlogged Wealth*, Institute for Environment and Development, 1986

Based on this study, the following (Figures 1 and 2) are breakdowns of wetlands for each of the County's planning regions as well as their general locations.

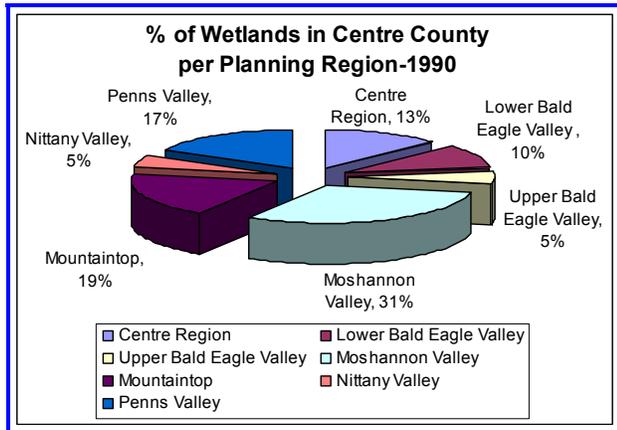


Figure 1: % of Wetlands in Centre County per

GENERAL LOCATIONS OF CENTRE COUNTY WETLANDS-1990	
Planning Region	General Locations
Centre Region	Bear Meadows Natural Area in Harris Township; Millbrook Marsh, College Township
Moshannon Valley	Black Moshannon State Park; Floodplains of Moshannon Creek and Black Moshannon Creek
Mountaintop	Snow Show area and along the West Branch of the Susquehanna River
Upper Bald Eagle Valley	Along Bald Eagle Creek
Penns Valley	Along Penns and Elk Creeks and in the Bald Eagle State Forest in Haines, Penn and Gregg Townships

Planning Region-1990 (Source: *Wetlands in Centre County*, Centre County Planning Office)

Figure 2: General Locations of Wetlands in Centre County-1990 (Source: *Wetlands in Centre County*, Centre County Planning Office)

The attached map (Appendix 1) shows the locations of wetlands in Centre County based on data from US Fish and Wildlife's National Wetlands Inventory.

Project specific wetland identification includes the environmental studies for the US Route 220, Corridor O and the studies underway for the South Central Centre County Transportation Study. In addition, an in-depth wetlands identification evaluation was done for the Philipsburg Wetland System, Centre and Clearfield Counties, in 1993. This study, initiated by the Moshannon Valley Council of Governments and the Centre County Planning Commission, grew out of a workshop which was organized for the purpose of bringing about a better understanding of wetland policy within the local government and business communities. The basis of the workshop was a number of wetland enforcement actions and to address a local perception that wetlands are a significant nuisance due to mosquitoes.

The Philipsburg Wetland System study was undertaken by the US Environmental Protection Agency, US Army Corps of Engineers in cooperation with the US Fish and Wildlife Service.

### Regulatory Protection of Wetlands

Regulatory oversight of wetlands rests with the Federal and state government; however, municipal governments may also adopt local regulations to protect wetlands.

Section 404 of the Federal Clean Water Act regulates the discharge of dredge and fill material into waters of the United States which includes wetlands. The issuance of Federal permits for the discharge of dredge and fill material into wetlands has been established as a cooperative effort by Federal, state and county agencies. This permit, Pennsylvania State Programmatic General Permit (PASP-GP-2), eliminates the need for multiple reviews for a development activity allowing for single agency review and processing. The state permit issued under Chapter 105 regulations for any proposed activities that involve the multiple discharges of dredge or fill material, excavation or encroachments of waterways,

water bodies and wetlands can also be issued through the PASPGP-2 permitting process.

PASPGP-2 is issued by the Department of Environmental Protection or the Centre County Conservation District. These two agencies are now responsible for processing 80% of these permits. Only projects that have significant environmental impacts are to be reviewed by the US Army Corps of Engineers which include: activities impacting wetlands within the 14-county range of the bog turtle, and activities impacting more than 250 linear feet of streams.<sup>12</sup> These types of projects may require that a separate Section 404 permit be issued. The United State Fish and Wildlife Service serves in an advisory role in the review of Section 404 permits. Attached (Appendix 4) is a more detailed overview of the permitting process.

In reference to isolated wetlands such as bogs and vernal ponds (vernal ponds are temporary bodies of fresh water, typically small and are fishless. These ponds usually dry up in the summer months), the US Supreme Court decided on January 9, 2001 that isolated waters no longer came under the jurisdiction of the Clean Water Act. The citation for this decision is the SWANCC Decision (Solid Waste Agency of Northern Cook County v. US Army Corps of Engineers). State and local governments are now responsible for protecting these waters. One example of these types of waters in Centre County is the vernal ponds in the Grays Woods area of Patton and Halfmoon Townships. Another example is the pond at Scotia, Patton Township.

Section 4(f) of the US Department of Transportation Act of 1966 also offers protection for wetlands. The policy which is implemented by the Federal Highway Administration (FHWA) addresses potential impacts to park and recreational lands, wildlife and waterfowl refuges, and historic sites. This policy applies to any project that requires approval by an agency of the US Department of Transportation including FHWA. A Section 4(f) Determination is the administrative action by which the Federal Highway Administration

confirms that, on the basis of extensive studies and alternatives analysis, there are no “prudent and feasible” alternatives to the taking of land from protected resources.



On a local level, wetlands may be protected and enhanced through zoning and subdivision/land development and stormwater regulations. These types of regulations may include: requiring wetland delineation and subtracting wetland areas from lot size requirements, creating a natural resources protection overlay zoning district, and prohibiting disturbance within 100 feet of a wetland.

*Guiding Growth, A Planning and Growth Management Handbook for Pennsylvania Municipalities*<sup>13</sup>, recommends protecting wetlands from building activity by buffering them with zones ranging from 50 to 150 feet depending on the functions of the wetland and the compatibility of the adjacent use.

### **Wetlands and Agriculture**

Agricultural producers are required to protect wetlands on the farms that they own or operate as provided for in the Wetland Conservation Act of 1985 and 1990. The provision, more commonly known as Swampbuster, makes agriculture producers ineligible for farm subsidies if converted wetlands are planted with agricultural commodities.

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<sup>13</sup> Robert E. Coughlin, Joanne R. Denworth, John C. Keene, and John W. Rogers, *Guiding Growth, Building Better Communities and Protecting Our Countryside*, Pennsylvania Environmental Council, 1991

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<sup>12</sup> Ibid

If a farmer intends to fill a wetland area then he or she must obtain a Section 404 permit from the US Army Corps of Engineers. However, certain farming activities are exempt from Section 404 which are: established (i.e. ongoing), normal farming activities-plowing, harvesting, seeding, minor drainage and cultivating; maintenances, but not construction, of drainage ditches; construction and maintenance of irrigation ditches; construction and maintenance of farm or stock ponds; and construction and maintenance of farm roads in accordance with best management practices.<sup>14</sup>

The USDA (United States Department of Agriculture) Natural Resources Conservation Service is the lead Federal agency responsible for wetland delineations on agricultural lands.

### **Non-regulatory Wetland Protection Strategies**

One effective approach to managing wetlands is a cooperative program established by the US Fish and Wildlife Service, Partners for Fish and Wildlife Program. This program began in Pennsylvania in 1989 and focuses on restoring habitats. The activities include: wetland restoration, grassland restoration, riparian fencing, bioengineering, restoration of threatened and endangered species habitat and in-stream restoration.

In recognition that a large percentage of the lands in the state are privately owned, the Program concentrated on developing partnerships with private landowners to improve fish and wildlife habitats. Other partners include Federal, state and county agencies, higher education institutions, and conservation organizations.

Wetland restoration techniques involve returning hydrology to formerly drained wetlands by removing or disabling field drainage tiles and plugging drainage ditches.

The total cost for a wetland restoration project is \$750 per acre.<sup>15</sup>

Another program recently reauthorized in Farm Bill 2000 is the Wetlands Reserve Program. This program is voluntary and provides technical and financial assistance to eligible landowners to address wetland, wildlife habitat, soil, water, and related natural resource concerns on private lands. It is administered by the USDA Natural Resources Conservation Service (NRCS).

Under this program, private property owners receive financial incentives to enhance wetlands in exchange for retiring marginal land from agriculture. Participants in the program apply for a conservation easement or a cost-share restoration agreement with USDA to restore and protect wetlands. Ownership of the protected area is retained.

Permanent easements, where the easement is in perpetuity, as well as the cost to restore the wetland are 100% paid for by USDA. The other easement option is a 30-year easement, whereby, 75% of a permanent easement as well as 75% of the restoration costs are paid by USDA.

Restoration Cost-Share Agreement is the third option available to landowners. It consists of an agreement (generally a minimum of 10 years) to re-establish degraded or lost wetland habitat. USDA pays 75% of the costs under this option.



<sup>14</sup> *Wetlands and Agriculture: Section 404 of the Clean Water Act*, USDA Natural Resources Conservation Service, US Army Corps of Engineers, US Environmental Protection Agency, US Fish and Wildlife Service, May 1995

<sup>15</sup> *Partners for Fish and Wildlife-Pennsylvania*, US Fish and Wildlife Service Website

In Centre County, the NRCS and the Partners in Fish and Wildlife (of which NRCS is a partner) work cooperatively on wetland restoration projects. NRCS generally focuses on projects with a minimum of ten acres. To date, this cooperative effort has restored over 40 acres of wetlands. Two of the projects are located in the Penns Valley Region and one in Huston Township, Upper Bald Eagle Region. In addition, NRCS partnered with the Pennsylvania Department of Environmental Protection on another project in Penn Township which is a five-acre site.

Another successful effort was a partnership between the Penns Valley Conservation Association, Chesapeake Bay Foundation and Ducks Unlimited (Figure 3). The project entailed planting 1,800 trees in marginal wetlands east of Aaronsburg, Haines Township. The intent is to rejuvenate the quality of the fresh water streams as well as the forested riparian buffers for wildlife habitat.



Figure 3: Penns Valley Conservation Association's (PVCA) Wetlands Restoration Project (Source: PVCA Website)

### **Identification and Delineation of Wetlands**

Identification of wetlands may be done with the assistance of various governmental agencies such as the US Army Corps of Engineers, US Fish and Wildlife Service and the Centre County Conservation District. Wetlands may

also be identified through the use of USGS (United State Geological Survey) Maps, National Wetlands Inventory Maps, US Soil Conservation Service (now referred to as the Natural Resources Conservation Service) Soil Survey Maps and/or aerial photographs. A good reference for identifying wetlands is a checklist developed by the Pennsylvania Department of Environmental Protection which is entitled Clues to Wetland Identification: Questions For Developers, Contractors, Surveyors, Farmers and Landowners. This list may be obtained from the Department's website at [www.dep.state.pa.us](http://www.dep.state.pa.us).

In terms of delineating wetlands, the US Army Corps of Engineers is the agency responsible for delineating wetlands on non-agricultural lands. The 1987 Corps Wetland Delineation Manual is the guidance document used for the delineations.

Delineation of wetlands on agricultural lands are made by US Department of Agriculture and are treated the same for the purposes of Section 404 of the Clean Water Act.

### **Wetlands Mitigation**

Mitigation is compensation through wetland restoration, enhancement, or creation for functions and values that are lost on a converted wetland.<sup>16</sup>

Pennsylvania has a Wetland Replacement Project that is administered by the Department of Environmental Resources, in cooperation with the National Fish and Wildlife Foundation. This program also works hand-in-hand with the US Army Corps of Engineers as to the permitting of mitigation efforts.

A developer may be eligible to contribute money to a mitigation fund if the area impacted is one-half acre or less. Mitigation is required for an area impacted which is over one-half acre in size.

Mitigation projects in Centre County are generally found in the Bald Eagle Valley.

<sup>16</sup> Fact Sheet-Mitigation, United States Department of Agriculture, Natural Resources Conservation Service (Source: USDA-NRCS Website)

## **Natural Heritage Inventory**

The *Natural Heritage Inventory* is a list of identified sites in Centre County that are key to the maintenance of biological diversity and ecological integrity. The Inventory includes some of the County's significant wetland communities. This information is to be used as a tool in planning for the protection of these resources.

The November 1991 report includes general recommendation for Natural Heritage Sites. In addition to preservation and complete protection of natural areas, recommendations specific to wetlands include:

- Avoid disturbances to site cores or buffer zones;
- Protect the hydrology supporting the site;
- Prohibit the spraying of pesticides in the natural areas such as gypsy moth extermination;
- Utilize proper disposal methods of brine which is a product of the drilling and operation of gas wells;
- Concentrate future pipeline construction and related road construction into already disturbed areas so as to minimize the impact of sediment pollution; and,
- Consider carefully any potential disturbance to these sites in light of the natural, open space, educational, scientific qualities that the site possesses.

In 2002, this Inventory was updated to include new and edited sites. Newly identified communities of wetlands have been added as part of this update process.

## **Threats to Wetlands**

Although we are beginning to see gains in the number of acres of wetlands in Centre County due to the cooperative efforts of many, it is uncertain as to how wetlands will fare with increasing development pressures particularly in some regions of the County.

Presently, there are conflicting opinions as to whether or not these eco-systems are in jeopardy. Some in the regulatory community

believe that Centre County's wetlands are not threatened; however, the survey results of the Penns Creek Watershed Assessment (April and May 2001) show that Penns Valley residents feel that the loss of wetlands in the Penns Valley area is a moderately severe problem. In addition, the findings of the evaluation of the Philipsburg Wetland System show that the wetlands in the Moshannon Creek-Laurel Run-Emigh Run study<sup>17</sup> area were being significantly impacted by surrounding land use. Acid mine drainage from coal mining activities has had the most significant impact on the wetland communities in this area.

Another aspect currently under study by the Pennsylvania State University's Wetlands Center is the state of the mitigated wetlands in the County. This information will prove helpful particularly as it relates to flood storage.

It appears that no comprehensive approach to the study of wetlands on a County-wide basis has been undertaken in Centre County which would provide better data on the state of our wetlands.

## **Conclusion**

Wetlands are important natural communities. The multi-faceted role that they play in our watersheds is critical. Although the regulatory responsibility for wetlands is at the Federal and state level, it is important the local officials are aware of wetland areas within their own municipalities and watershed. Land use planning tools can be written to offer additional protections for these communities which would tie in with the efforts of the Federal and state agencies. Since the majority of the County's wetlands are in floodplain areas, it is also important that floodplain regulations protect the functions of its related wetlands. In sum, a more comprehensive approach to managing our wetlands will ensure their health for future generations.

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<sup>17</sup> *Technical Basis for Advance Identification Wetland Site Evaluation, Philipsburg Wetland System, Clearfield and Centre Counties, Pennsylvania*, US Environmental Protection Agency Region III, Gannett Fleming, Inc. and EcolSciences Inc., September 30, 1993

## NATURAL RESOURCES GOAL

Identify, preserve, and monitor Centre County's environmental natural resources for the benefit of present and future generations.

### OBJECTIVES

Promote the wise use and management of the County's natural resources that include prime agricultural lands, forested areas, and mineral resources.

Protect watershed features such as surface and underground water supplies, streams, floodplains, wetlands, fish and wildlife habitats, and aquifer recharge areas.

Promote and preserve the County's identified natural areas for scenic, educational, historic, environmental, recreation and tourism purposes.

Use identified natural resource areas and public open spaces to provide guidance with land development activities.

### RECOMMENDATIONS



Protect wetlands within Centre County from alteration and degradation by guiding land development activities to upland areas.



Modify the Centre County Subdivision and Land Development Ordinance to include conservation design principles.



Promote stream corridor management techniques, i.e., riparian buffers and stream corridor overlay districts to protect the wetlands within floodplain areas.



Promote vegetative buffers around inland wetlands especially Exceptional Value wetlands.



Support watershed initiatives that provide for wetland protection.



Explore opportunities to protect floodplains and wetlands through the implementation of the Nittany and Bald Eagle Greenway/Bikeway Project and Spring Creek Rivers Conservation Plan.



Discourage the spraying of pesticides in wetland areas.



Encourage proper disposal methods of brine, a product of the drilling and operation of gas wells, as well as other wastes.



Protect the hydrology of wetland areas.



Encourage Centre County municipalities to:

- Adopt stream corridor overlay districts.
- Incorporate the establishment of riparian buffers into local regulations
- Prohibit development in the 100-year floodplain.
- Work with Centre County land trusts to acquire conservation easements for Exceptional Value wetlands.
- Prohibit plantings of invasive plant species by property owners.
- Modify local subdivision/land development and zoning regulations to include conservation design provisions.
- Explore opportunities to protect floodplains and wetlands through the implementation of the Nittany and Bald Eagle Greenway/Bikeway Project and the Spring Creek Rivers Conservation Plan.
- Prohibit the discharge of unmanaged stormwater into wetlands through local stormwater management regulations.

# APPENDIX

# Appendix 1

## Centre County Map of Floodplains, Floodplain Soils and Wetlands



# Appendix 2

## Recommended Buffer Widths

## RECOMMENDED BUFFER WIDTHS

BASED ON LAND USE SETTINGS			
AREA	MINIMUM	IDEAL	BUFFER TYPE
Urban/Developed Areas	30'	30'	Undisturbed forest
	50'	100'	Managed forest
	25'	25'	Grassy vegetated filter strip
Agricultural Areas	30'	30'+	Undisturbed forest
	30'	50-100'	Managed forest
	25'	25'	Grassy vegetated filter strip
Forested Areas	100'		Mature riparian forest
Sensitive Areas <sup>18</sup>	300'		Mature riparian forest

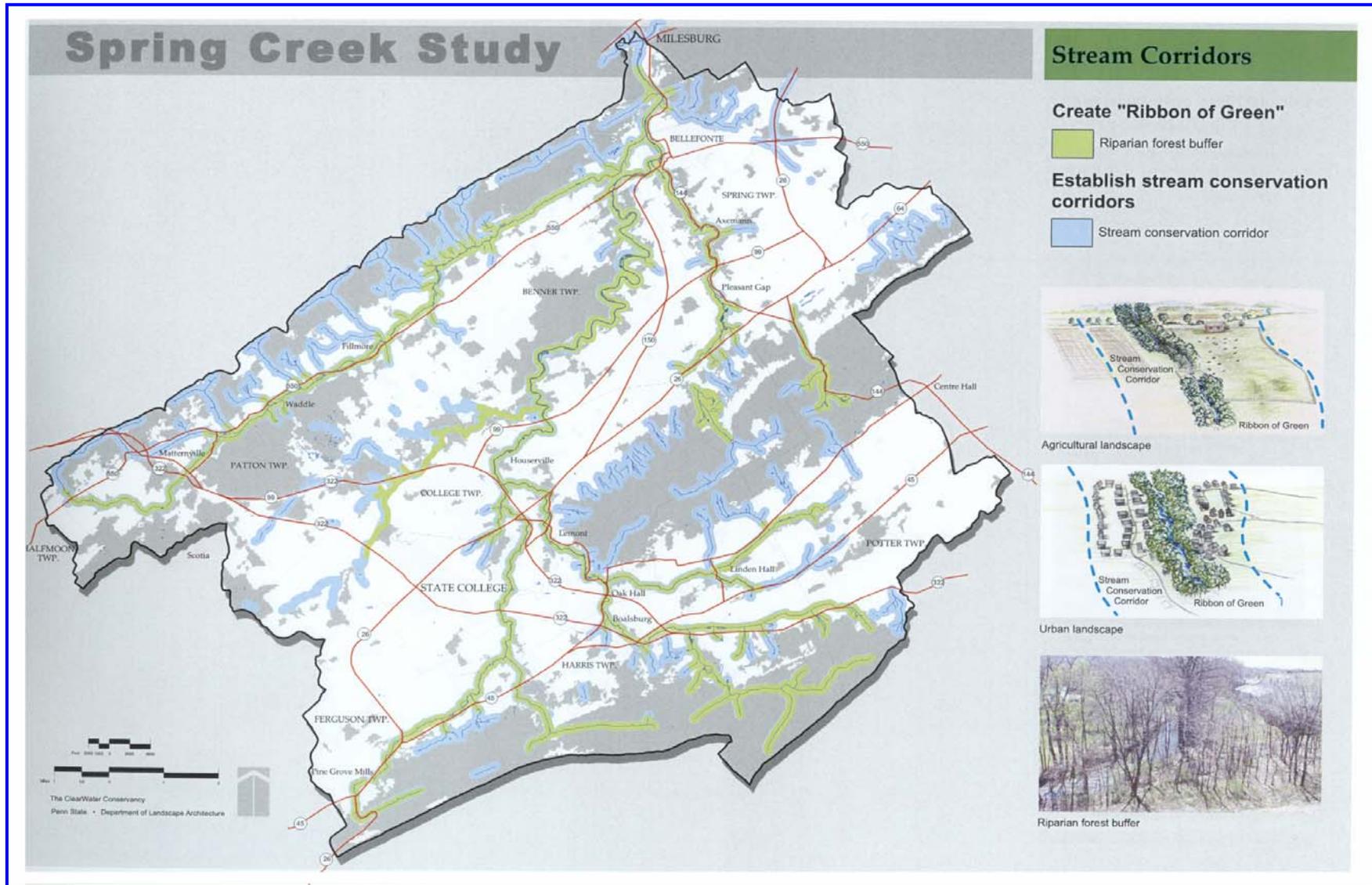
BASED ON FUNCTION	
FUNCTION	BUFFER WIDTH FROM WATER'S EDGE
Sediment Control	50-100
Streambank & Streambed Erosion Control	25-200
Nutrient and Pollutant Removal	150-300
Reservoir Protection	75-300
Stream Temperature Control	25-200
Aquatic Species	25-50
Wildlife Habitats	200-300

FIGURE A3: Recommended Buffer Widths (Source: Spring Creek Study: Phase II and Landscapes, a project of the ClearWater Conservancy; and Community Planning Handbook, Volume 1, A Toolbox for Managing Change in Chester County)

<sup>18</sup> Sensitive areas are characterized by steep slopes, development-sensitive soils, or ecologically valuable. (Source: *Spring Creek Study: Phase II, A River Conservation Plan*, December 2000)

# Appendix 3

## Spring Creek River Conservation Plan Green Corridors



Green Corridors (Source: Spring Creek River Conservation Plan, Phase II, A Study sponsored by the ClearWater Conservancy)

# Appendix 4

## Pennsylvania State Programmatic General Permit (PASPGP-2)

