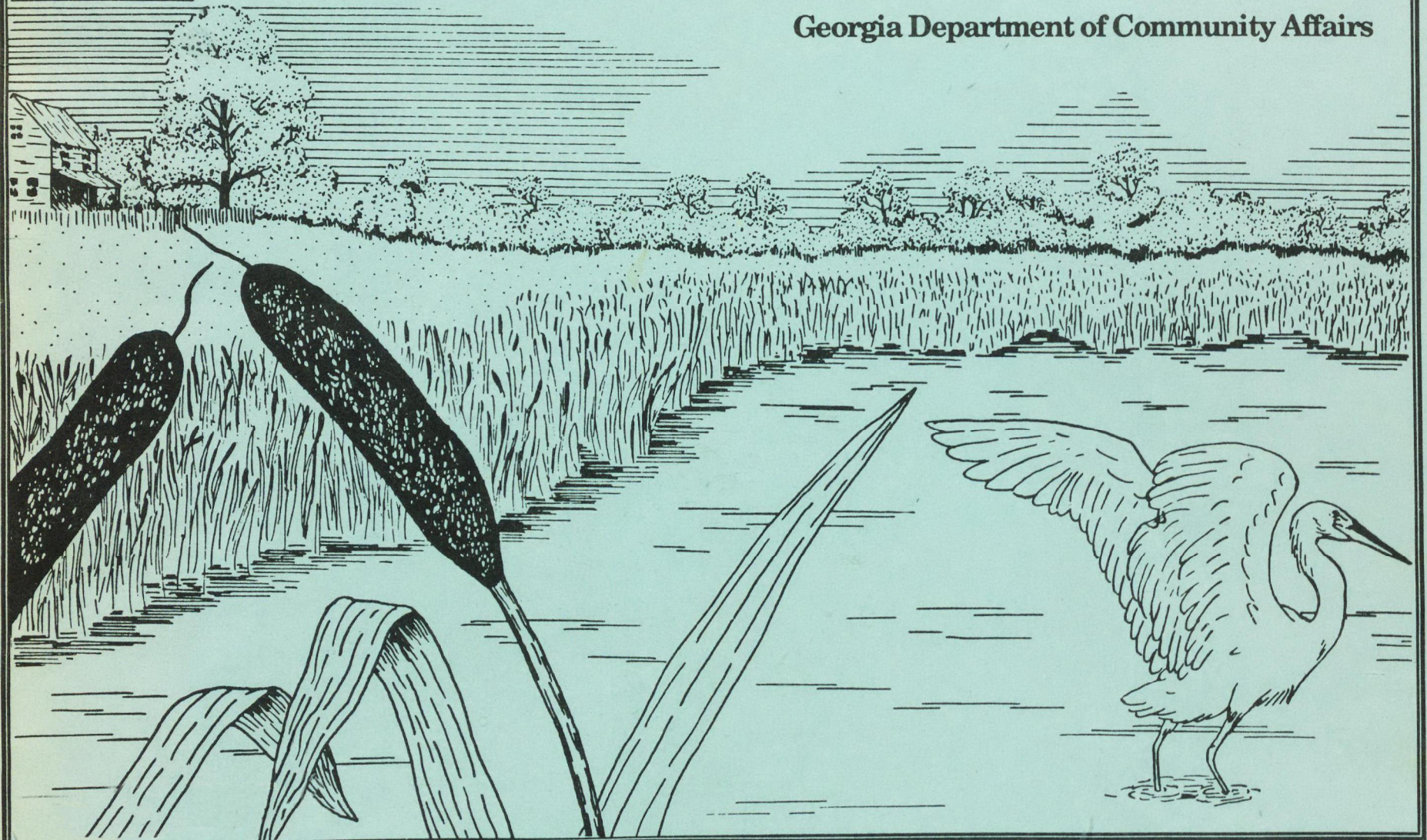


Landowners' Guide to Wetlands and Watersheds

Georgia Department of Community Affairs



January 1995

Landowners' Guide to Wetlands and Watersheds

Georgia Department of Community Affairs
Jim Higdon, Commissioner

Office of Coordinated Planning

**1200 Equitable Building
100 Peachtree Street
Atlanta, Georgia 30303**

An Equal Opportunity Employer

**Region IV Protection Agency
LIBRARY
US EPA Region 4
AFC/9th FL Tower
61 Forsyth St. S.W.
Atlanta, GA 30303-3104**

THE PUBLICATION OF THIS DOCUMENT WAS FINANCED IN PART THROUGH A WETLANDS
PROTECTION GRANT FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY.

Landowners' Guide to Wetlands and Watersheds

Objectives of this Guidebook

Through its administration of the planning process mandated by the Georgia Planning Act of 1989, the Department of Community Affairs (DCA) encourages wise land use at the state, regional, and local levels. Wise land use entails using the state's natural resources in a judicious manner, thereby guarding the health and welfare of the public as well as ensuring the long-term economic health of Georgia's communities.

It has been recognized that certain natural resources, including wetlands and water supply watersheds, have been threatened by unwise land use practices. These practices have included destroying wetlands by filling them and converting them to other land uses and other activities that have led to degradation of water quality within water supply watersheds.

An array of state and federal laws has been designed to protect wetlands and watersheds. Lack of understanding of these laws has led to a certain amount of confusion and frustration among landowners, frequently as a result of inadvertent violations or long delays in acquiring needed permits. This is particularly true in the case of wetlands, where the problems are increased by general confusion over what constitutes a wetland.

Under these confused circumstances, the safe-guarding of natural resource protection and economic well-being may seem difficult to reconcile. Promotion of wise land use policy and compatible natural resource protection and economic growth are the primary reasons DCA has compiled this document. Reconciliation is attempted by clearly explaining federal and state laws and policies with respect to wetlands and watersheds, the types of permits necessary for development, the application processes for these permits, and ways of facilitating the permitting processes. A discussion of site design options that may help the landowner or developer design a project that avoids or minimizes impacts on wetlands and watersheds is also included.

It should be noted that the opinions and conclusions expressed in this document are those of DCA and do not necessarily reflect those of the Georgia Department of Natural Resources or the U.S. Environmental Protection Agency.

Landowners' Guide to Wetlands and Watersheds

Table of Contents

Introduction	1	Georgia Coastal Marshlands	
What is a Wetland?	1	Protection Act	22
Why Should Wetlands be Protected?	3	The Section 404 Permitting Process	22
Identification of Wetlands	5	The Food Securities Act of 1985	23
Introduction	5	Watershed Protection	24
Wetland Types	5	What is a Watershed?	24
How to Determine if there		Why Should Watersheds	
are Wetlands on Your Property	8	be Protected?	25
Wetlands Maps	8	How to Determine if your Property	
General Inspection of the Site	8	is Located within a Water Supply	
Design and Construction Considerations		Watershed	25
for Wetland Areas and Water Supply		Developing Property in a Watershed	28
Watersheds	9	Conclusion	30
Cluster Development	9	Appendix A	31
Preservation of Natural		Delineation of	
Vegetation	11	Jurisdictional Wetlands	31
Runoff, Erosion and		Submittal of a Permit Application	31
Sedimentation	14	Application Review Process for	
Minimizing Damage when		Individual Permits	32
Wetlands are Filled	17	Georgia's Coastal Marshlands	
Preservation, Restoration and		Protection Act	33
Creation of Wetlands	18	Appendix B	35
Federal and State Wetland Regulation	19	Appendix C	37
Introduction	19	Appendix D	39
Federal Clean Water Act of 1977	19	Appendix E	40
The Permitting Process	20	Appendix F	41
Letters of Permission	20	References	43
Nationwide Permits	20		
Regional Permits	21		
Individual Permits	21		

Introduction

This guidebook is designed to aid property owners and developers in understanding the rationale and legal framework of wetland and watershed protection, the Clean Water Act (CWA), Section 404 permitting process with respect to wetlands and development techniques for minimizing damage to these ecologically important environments. The protection of coastal marshlands by the Georgia Department of Natural Resources (DNR), mandated by the Coastal Marshlands Protection Act of 1970, as amended, is also discussed. The ongoing controversy surrounding wetland definition is not discussed, and the problems of wetland delineation are only briefly discussed. Instead, this guidebook is intended as a general guide to techniques of construction and site design that the landowner or developer can use to minimize damage to wetlands and watersheds. In addition, guidance with respect to the Section 404 permitting process is intended to facilitate understanding and reduce the chances of unwelcome delays for individuals making a 404 permit application. The Section 404 permitting process is fully explained in Appendix A.

What is a Wetland?

A wetland, as the name suggests, is characterized by the presence of water, either at the surface or just beneath it. Some wetlands, such as marshes, swamps and bogs, are easy to recognize because they are periodically or permanently covered with water. Other wetlands are more difficult to recognize because they are only infrequently flooded and their soils only saturated for a relatively brief period during the year. Estimates of the total wetland

acreage in Georgia have varied, depending on the definitional criteria used and research technique employed. It has been estimated that Georgia pos-

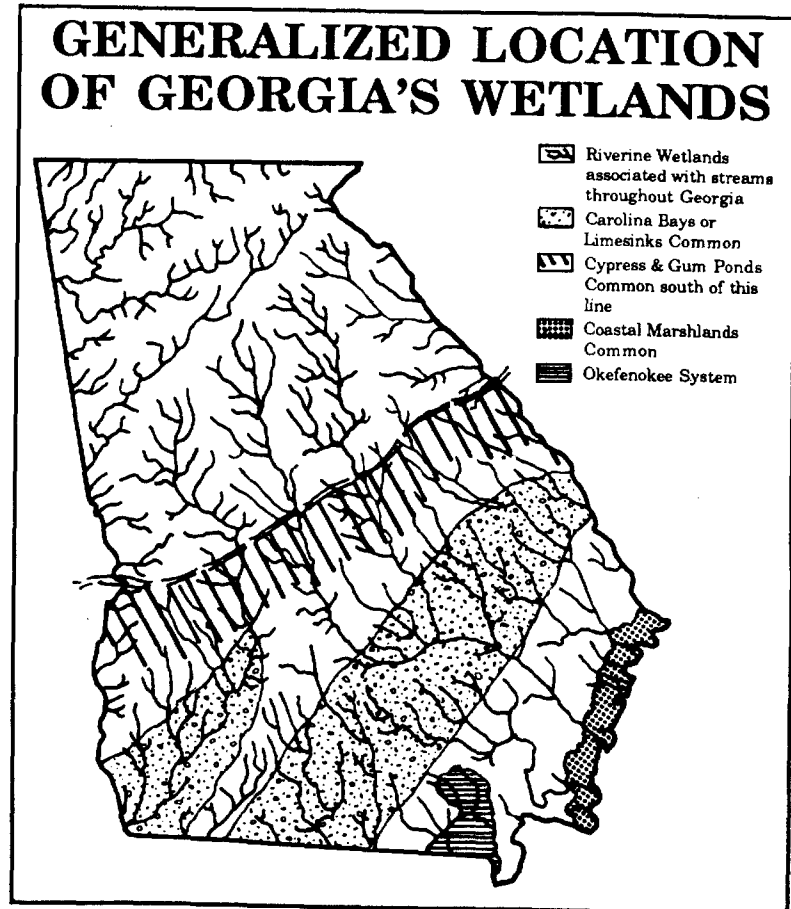


Figure 1

sessed as many as 6.8 million acres of wetlands in 1790. The U.S. Fish and Wildlife Service Survey of 1956 estimated almost 6 million acres of wetlands in the state. A more recent analysis by

DNR, using satellite imagery, estimated total acreage at 4.3 million. However, the DNR analysis was hampered by difficulty in distinguishing between some wetlands and land uses that looked similar in satellite imagery. Recent estimates by the Fish and Wildlife Service have placed total acreage at approximately 5 million. These wetlands, in their various forms, are found in all regions of the state, although they are most heavily concentrated in the coastal plain (see Figure 1).

Throughout much of our history, wetlands were regarded as wastelands and centers of disease, to be drained or filled and converted to their "highest and best use" as quickly as possible. It was not until the 1950s that the ecological values of wetlands began to be generally recognized. These values include processing and cleansing surface water supplies and serving as retention areas for stormwater runoff. Coastal wetlands (saltwater marshes) have been recognized as irreplaceable breeding grounds and nurseries for commercially important seafood resources. As such, they are protected by the state's Coastal Marshlands Protection Act. Wetlands are also valued as habitats for endangered and threatened plant and animal species and as recreational resources.

In recognition of the value of wetlands, certain activities within wetlands are regulated by the federal and state governments, as well as many local governments. Actions that have an adverse impact on the ecological functions of wetlands are generally regulated at the federal and state levels. Activities that result in the discharge of sediment into a wetland or filling of a wetland are regulated through a permitting process administered by the

U.S. Army Corps of Engineers, while oversight of wetland protection and guidance are provided by the Environmental Protection Agency (EPA). In addition, the State of Georgia, in cooperation with the Corps of Engineers, protects coastal marshlands by requiring a joint permit for wetland altering activities.

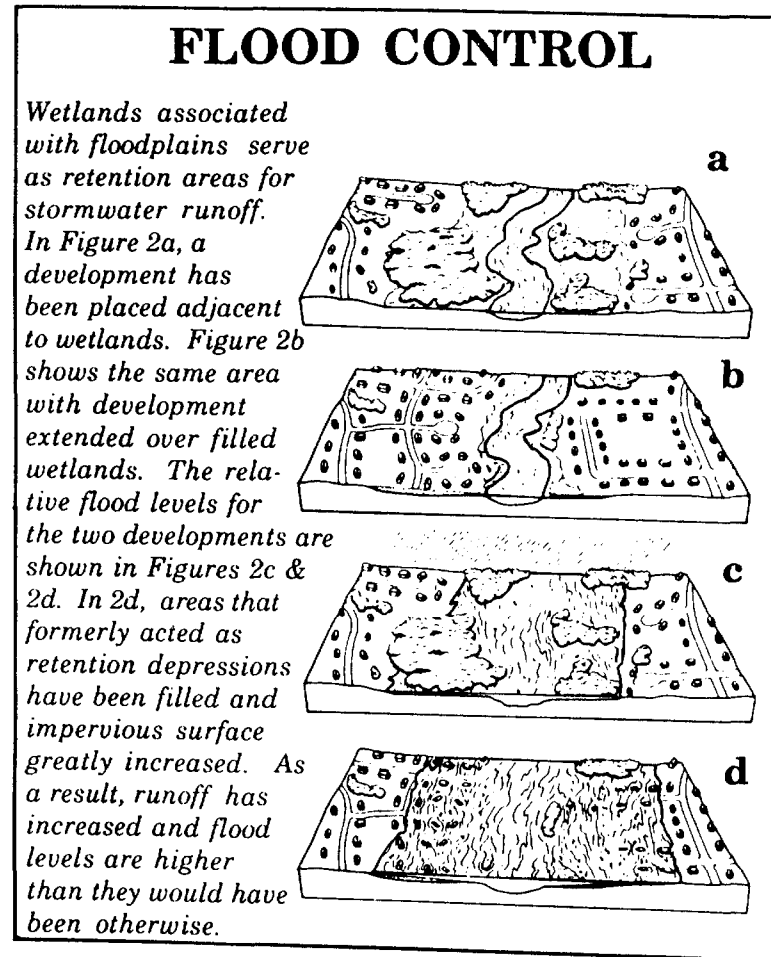


Figure 2

Why Should Wetlands Be Protected?

Although they are often seen by the uninformed as nuisances, wetlands perform a variety of important environmental functions. It has been estimated that wetlands allow an annual saving of billions of dollars that would otherwise be spent on waste

water treatment, flood protection and repair of damage from floods (see Figure 2). As topographically low areas, wetlands form natural retention and detention ponds that intercept and hold stormwater runoff. Wetlands also act as buffers between open water and dry land, guarding against erosion by wind and waves.

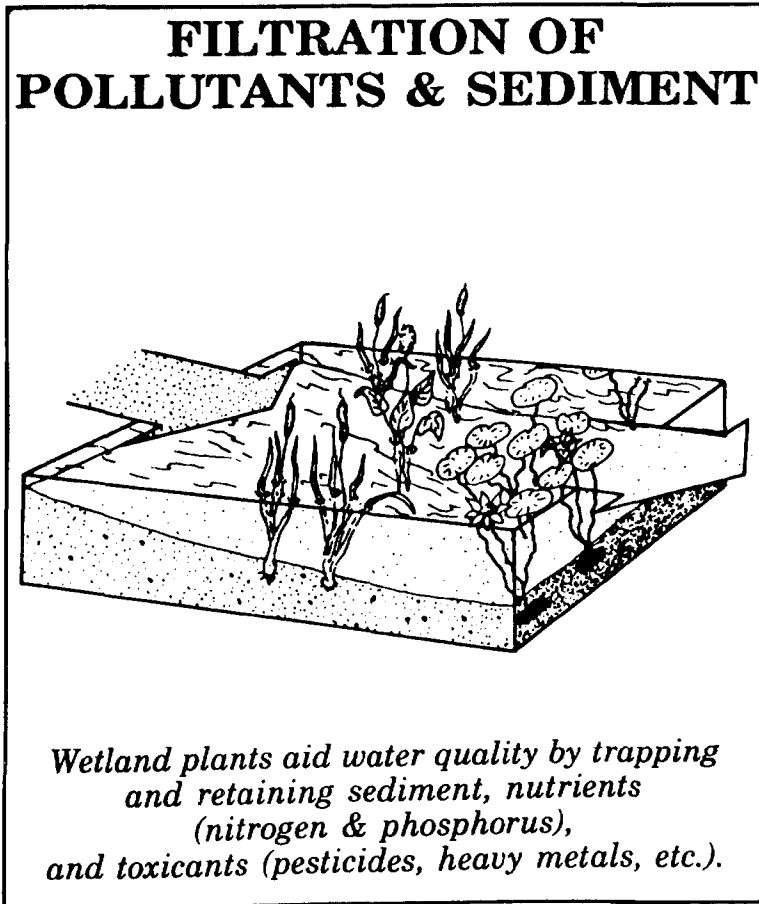


Figure 3

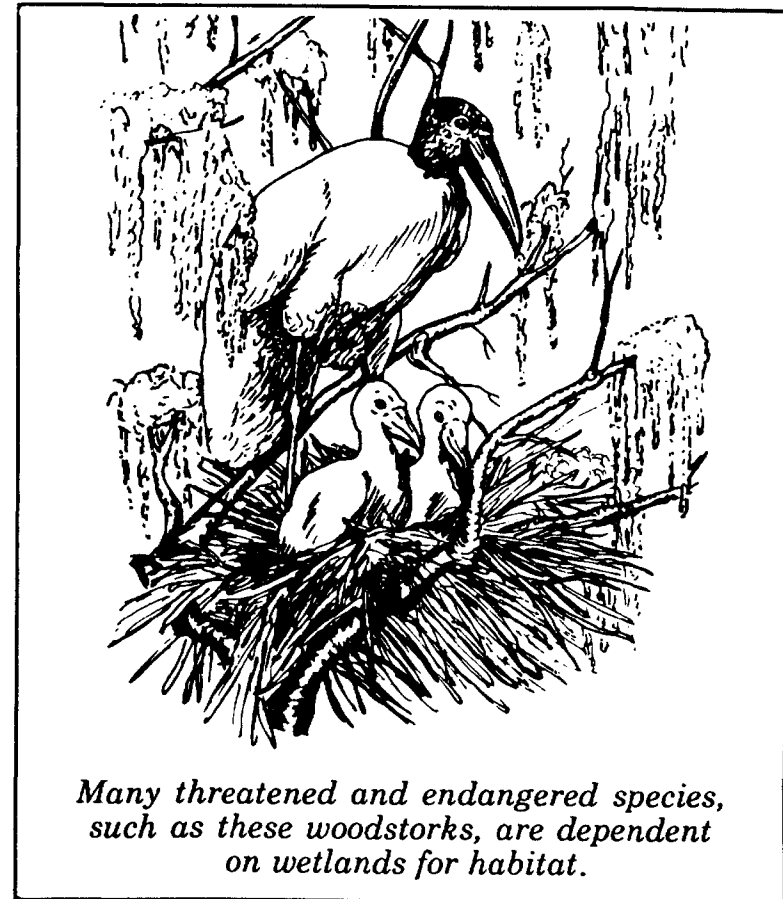


Figure 4

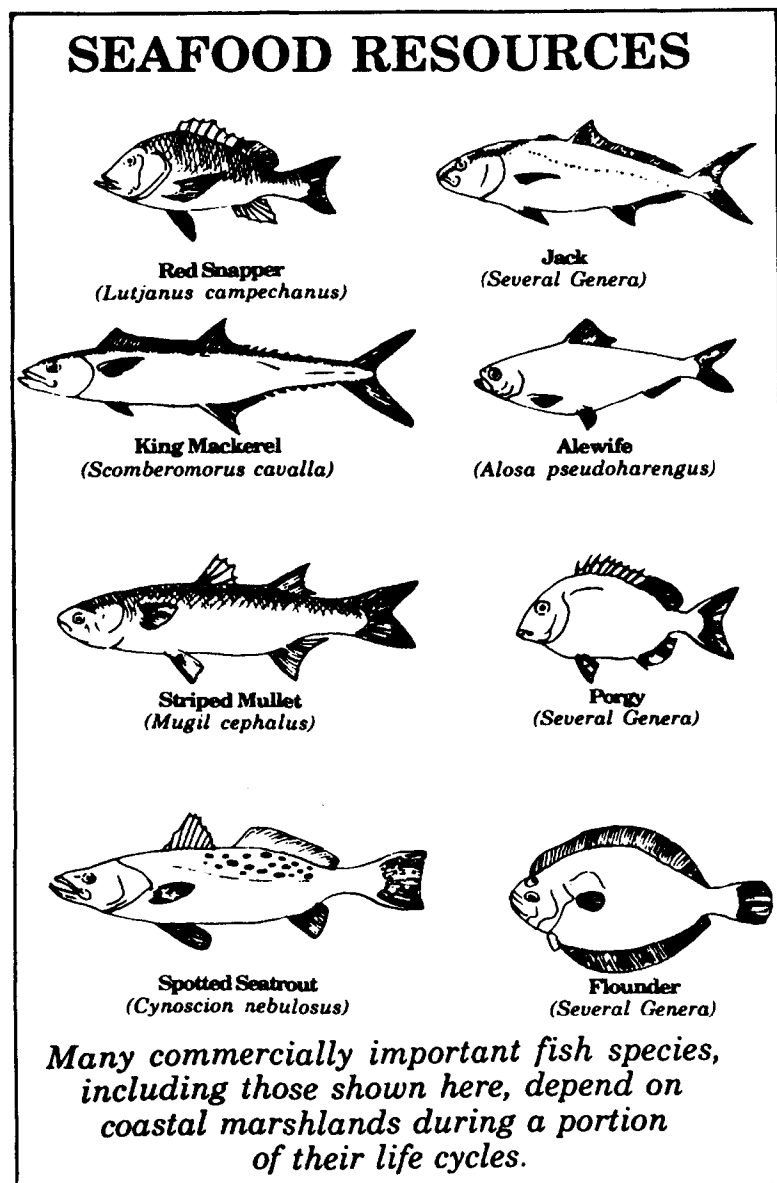


Figure 5

Wetland plants serve as an effective natural water filter system, trapping pollutants and sediment in their root systems (see Figure 3). Many of these plants have features that allow them to remove excess nutrients, such as nitrogen and phosphorus, from surface waters. If not kept in balance, nutrients lead to the overgrowth of algae. Water bodies affected in this way become "oxygen poor," so that fish and other species cannot exist within them.

Surface water recharge is another vital function of wetlands. During wet seasons, wetlands store large amounts of water which is gradually released into streams, rivers and ponds during the spring months, when water levels are declining.

A wide variety of animals and plants live exclusively within wetlands, including a large number of endangered and threatened species (see Figure 4). It has been estimated that wetlands sustain nearly one-third of the nation's threatened or endangered species. In addition, many species, such as ducks and geese, rely on wetland habitats during their annual migrations. Coastal marshlands, as well as many fresh-water wetlands, serve as breeding grounds and nurseries for commercially and recreationally important fish and shellfish resources. Approximately 60-80 percent of major U.S. commercial fishes depend on estuaries and saltwater marshes for spawning grounds or nurseries. These include bluefish, menhaden, sea trout, flounder, fluke, mullet, striped bass and drum (see Figure 5).

Half of the fish species caught by recreational fishermen, including catfish, trout and largemouth bass, rely on wetlands in one way or another. Many wetlands serve as recreational resources for

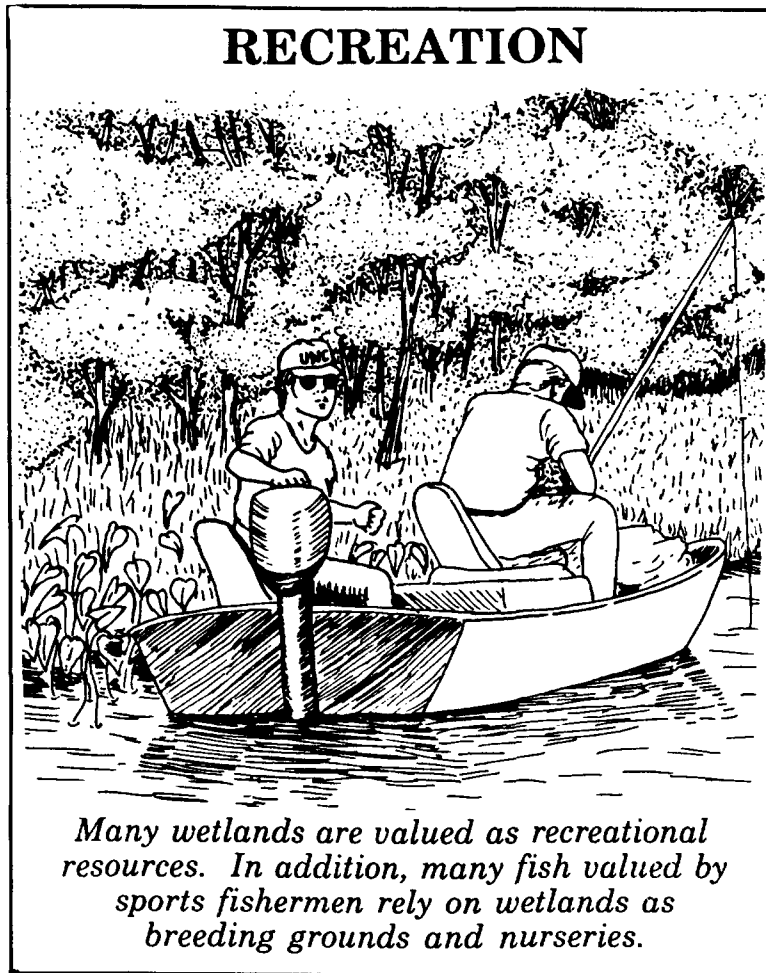


Figure 6

fishermen, boaters, campers and hikers (see Figure 6).

Finally, Georgia's wetlands are valued for their timber resources. It has been estimated that the timber in southern wetland forests is worth over \$8

billion. If managed wisely, these forests will continue to be an important source of timber.

Identification of Wetlands

Introduction

In order to preserve the vital ecological functions of wetlands, development in and around wetland areas should be avoided where possible, or performed in ways that minimize detrimental impacts to wetlands. Minimizing impacts is also a necessary component of development in complying with federal, state and in many cases, local government regulations. Such compliance begins with the identification and delineation of wetlands on a property that someone wishes to develop.

Wetland Types

Wetlands vary greatly in terms of size, physical form, function and predominant vegetation. For a comprehensive discussion of wetland types, see Cowardin, et al., *Classification of Wetlands and Deepwater Habitats of the United States* (1979). For purposes of this discussion, wetlands can be divided into two broad categories, tidal wetlands and nontidal wetlands. Tidal wetlands, commonly called coastal marshlands, are located in the low-lying areas along Georgia's coast and are subject to regular or periodic inundation by oceanic tides. There are over 500,000 acres of coastal marshes in the state's six coastal counties. Generally, these marshlands are characterized by the presence of grassy plants such as saltmarsh cordgrass (*Spartina alterniflora*) and needlerush (*Juncus roemerianus*) (see Figure 7). The Georgia Coastal Marsh-

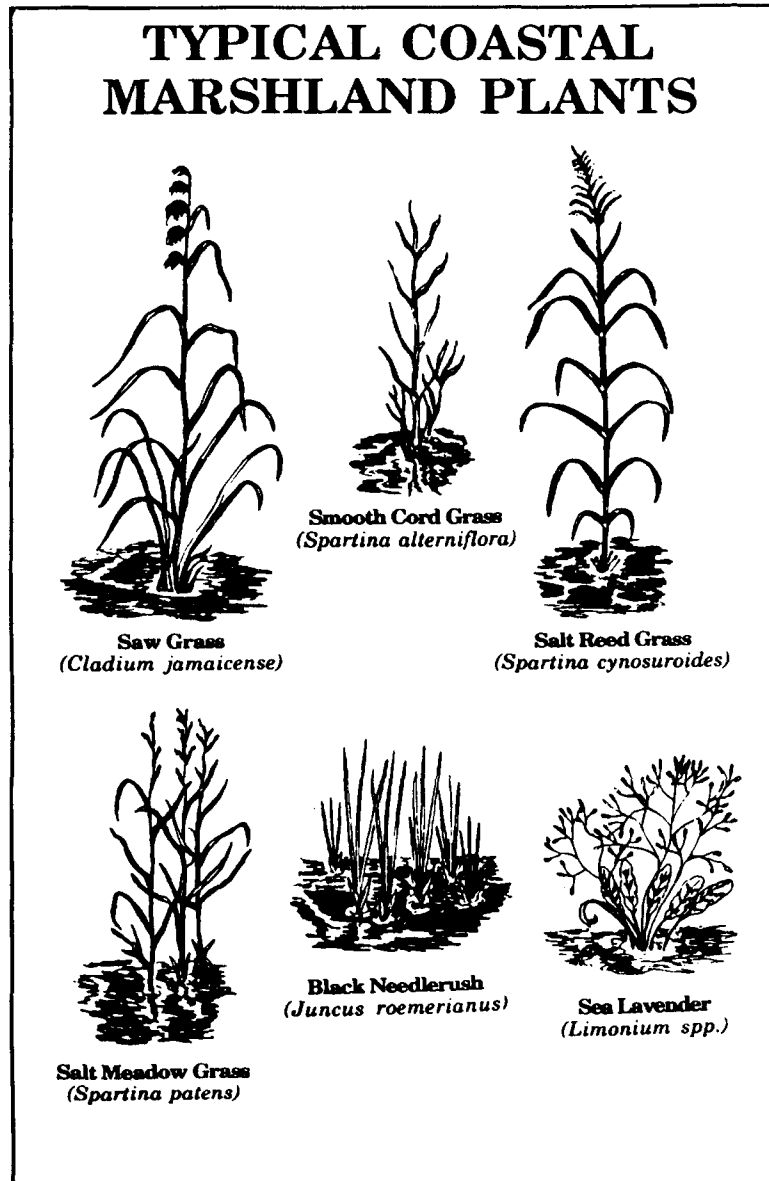


Figure 7

lands Protection Act of 1970 defines coastal marshlands as wetlands that extend to an elevation of 5.6 feet above the mean high tide level. Activities that alter a coastal marshland require a permit issued by the Coastal Resources Division of the Georgia Department of Natural Resources.

Nontidal wetlands occur throughout the state. These wetlands are often more difficult to identify than coastal marshlands, primarily because of the wide variety of forms they can take. A general knowledge of wetland types and reference to wetland maps available from the federal and state governments, sometimes supplemented by local maps, can ease the difficulty of locating wetlands on a particular parcel.

Common types of nontidal wetlands include: (1) riverine wetlands, commonly called bottomlands; (2) Carolina bays; (3) cypress and gum ponds; and (4) limesinks. Riverine wetlands are found in the floodplains of streams and rivers. These wetlands are periodically covered by floodwaters and are important because of the roles they play in flood control and water quality. Riverine wetlands, quite variable in composition, are found in all parts of the state. They are often forested, with bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) frequently associated with so-called brown-water streams in the coastal plain, while pond cypress (*Taxodium ascendens*) and swamp blackgum (*Nyssa biflora*) are frequently associated with black-water streams (see Figure 8). Many other broadleaf trees are also present in riverine wetlands, including yellow poplar, sycamore, several species of oak, red maple, sweetgum, green ash, water hickory, ash, cottonwood and river birch. Vari-

ous needle-leaf trees are also common, including loblolly pine, spruce pine and pond pine. Cypress and gum ponds are characterized by their vegeta-

tion, which includes pond cypress and swamp blackgum. These wetlands are most common in the coastal region of the state.

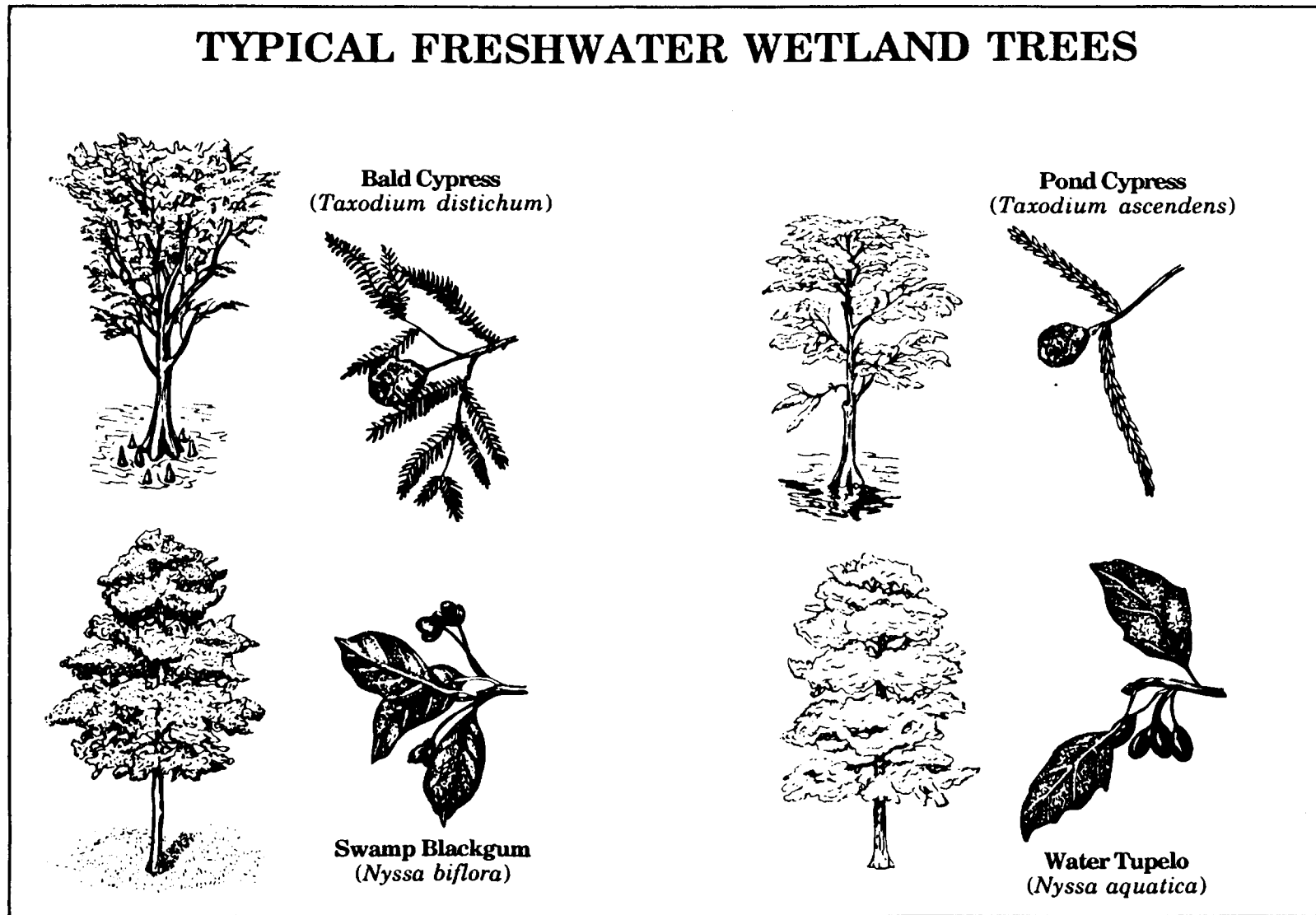


Figure 8

Carolina bays are primarily found in the south-central to southeastern area of Georgia. They are characteristically oval in shape and vary widely in size and water depth. There is a general northeast-to-southwest trend to Carolina bays, and to the south and east they have raised sandy rims. The origin of Carolina bays is something of a mystery. Common plants associated with these wetlands include fetterbush (*Lyonia sp.*), green briar (*Smilax sp.*), switch cane (*Panicum sp.*) and buttonbush (*Cephalacanthus sp.*). Common trees include pond pine (*Pinus serotina*) and several species of bay (*Magnolia*, *Gordonia* and *Persea*). Limesinks are depressions formed when underground caverns, occurring in limestone bedrock, collapse. Most limesinks are found in the southwestern portion of the state, where limestone is common. Some limesinks also occur along the fall line in central Georgia and in the northwest corner of the state. It is difficult to generalize about characteristic vegetation. A wide variety of plants are associated with limesinks.

How to Determine if there are Wetlands on Your Property

A Section 404 permit is required for most activities involving dredge and fill in wetlands. The delineation of such wetlands on a site must be made directly by the U.S. Army Corps of Engineers or by an approved consultant whose work is subject to review by the Corps. However, a landowner who suspects that there are wetlands on a site can call upon a number of informational resources and techniques to determine, in a general and preliminary fashion, if wetlands are present.

Step 1. Wetland Maps. Wetland maps are valuable general references and should be consulted as a first step in determining the presence of wetlands. National Wetlands Inventory (NWI) maps are available from the U.S. Geological Survey and the Georgia Geologic Survey Sales Office. It should be kept in mind that the scale of these maps limits their usefulness in delineating wetlands within particular property parcels. They are drawn at the same scale as U.S.G.S. topographic quad maps, with a scale of 1 inch on the map representing 24,000 inches on the ground (approximately two-fifths of a mile). County soil surveys can also be useful, indicating the locations of poorly drained soils. Hydric soils include soils that are formed by ponding or saturation for as little as seven consecutive days during the growing season (which lasts from February to October for much of Georgia). Local governments often maintain an archive of these and other maps, such as floodplain maps, and can supply copies to the public. However, soil surveys are not available for all locations. Every county in Georgia has a hydric soils list that is maintained by the Soil Conservation Service field office. Wetland landcover maps, at a scale of 1:24,000, have also been compiled by DNR and are available for inspection at most of the state's regional development centers.

Step 2. General Inspection of the Site. Walking over the site is a useful first step in searching for indications that wetlands may be present. One should look for indications of the presence of water at or just beneath the surface, such as mud on the trunks of trees, mud covered leaves on shrubs, or fences containing obvious water-deposited debris.

If the soil is saturated for two weeks or more dur-

ing the growing season, it is likely that the area is a wetland. The growing season is defined as the period between the last killing frost of spring and the first killing frost in the fall. The period of saturation necessary to form wetland soils can be quite short. Part of the ongoing debate about wetland definition concerns the length of time soil should be saturated in order for a particular site to be considered a wetland. Periods ranging from seven days to 30 days during the growing season have been suggested. Currently, the 1987 definition for jurisdictional wetlands, using a period of 15 consecutive days of saturation or seven consecutive days of inundation, is recognized by EPA and the Corps.

Although wetlands and saturated soils generally occur in low-lying areas and natural depressions, this is not always the case. In some cases, wetlands can occur on slopes adjacent to springs or in areas where an impermeable subsurface layer of clay or bedrock interferes with groundwater infiltration. The presence of saturated soils (hydric soils) is an indication of the presence of a wetland. Soil color and odor can be used as indicators of poorly drained soils. Soils that are frequently saturated tend to have a gray to black color and may exude an unpleasant "rotten egg" odor. The presence of particular plant species can indicate the presence of a wetland, although wetland determinations can rarely rely exclusively on the presence or absence of plant species. Relatively few plants live exclusively in wetlands (so-called obligate wetland species) and it is, therefore, difficult to use plants alone as indicators. Illustrated guides to wetland plants are available from a variety of sources. Some of these source materials are listed in the bibliography. Appendix E lists common Georgia wetland plant species.

Design and Construction Considerations for Wetland Areas and Water Supply Watersheds

The landowner or developer who is considering developing a property containing wetlands is faced with a number of challenges. If alteration of the wetland is necessary, the first challenge is acquiring a permit from the Corps of Engineers (and, in the case of coastal marshlands, from DNR) prior to construction.

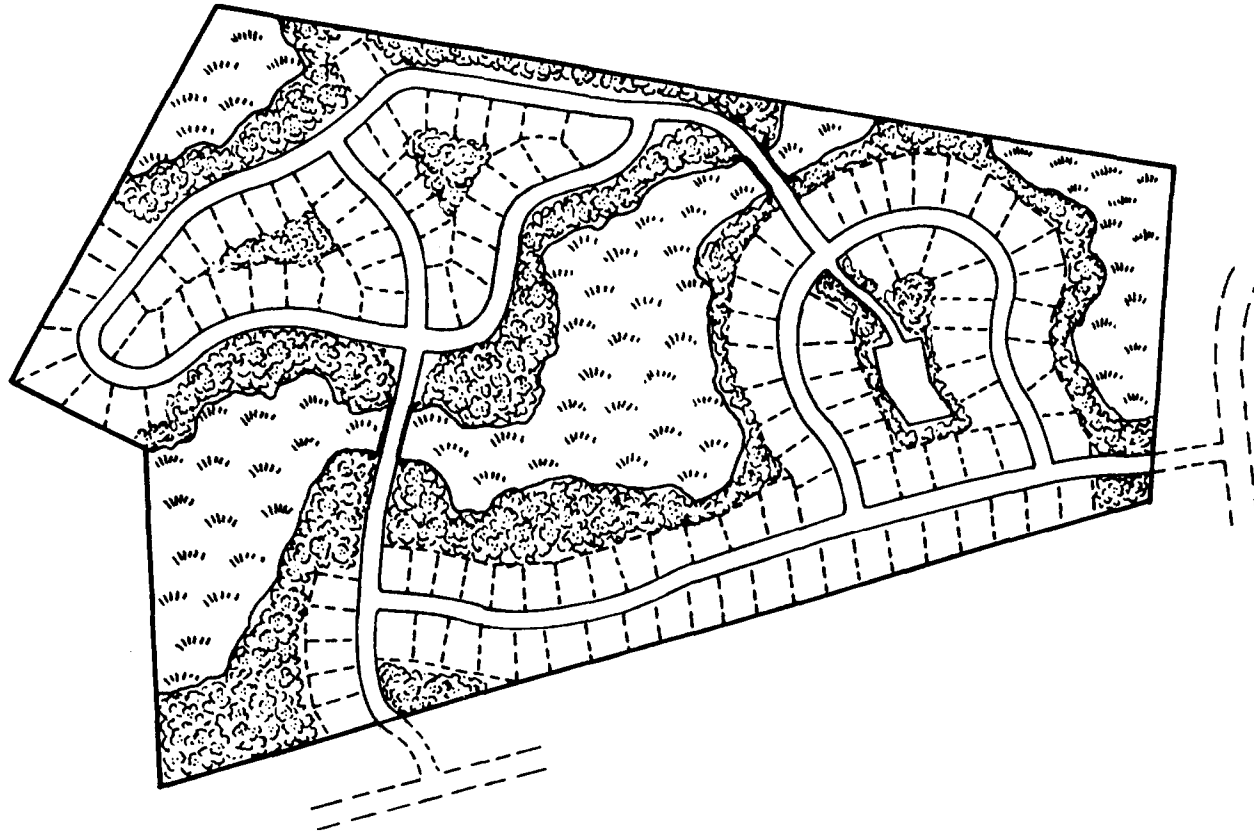
It is often easier to obtain a permit if the proposed activity is designed in such a way as to keep impacts to a minimum. Creative site designs that take into account the form and function of wetlands and minimize negative impacts are more likely to be accepted by permitting agencies. Pre-application meetings with the permitting agencies can be invaluable and used as opportunities for receiving valuable suggestions on site design.

The following discussion focuses on aspects of site design and construction that can be used to preserve wetlands while utilizing the maximum potential of a site. It should be noted that these techniques are equally applicable to development within water supply watersheds, which are discussed in more detail in a later section of this book.

Cluster Development

Accommodation of wetlands in a site design does not necessarily imply a large reduction in overall floor area or density. One method for preserving overall density of a proposed development while preserving open space is cluster development. This technique involves concentrating structures on the

TYPICAL CLUSTER DEVELOPMENT



In areas where highlands are isolated by intervening wetlands, one method of minimizing the amount of wetlands damaged or destroyed by development is by clustering development on highlands. In the illustration above, lots have been gathered on the hills and a vegetated buffer between developed sites and the wetlands has been preserved. A vegetated buffer between a developed site and a wetland slows stormwater runoff into the wetlands and filters out pollutants. Leaving natural vegetation in place enhances the visual appeal of the site.

Figure 9

upland areas of the property at a higher density than would normally be allowed (see Figure 9). In cases where zoning regulations exist, the developer may also be awarded a "density bonus"; however, cluster development is not always allowed under local zoning regulations. The landowner or developer should be thoroughly familiar with local land use regulations prior to the design phase of a contemplated construction project. This will save time and help avoid costly plan revisions.

Cluster development coupled with site-sensitive design will allow the developer to preserve and work around wetlands, thus lessening development impacts and usually simplifying the permitting process. Often there are the additional benefits of minimizing the cost of infrastructure, such as water and sewer lines and the amount of cut and fill required during construction. Clustering of development also minimizes the amount of impervious surface in the development, thereby lessening stormwater runoff and non-point source pollution. Post-construction problems with flooding and other water-related problems may also be minimized.

A residential development in Atkinson, New Hampshire provides an illustration of how cluster development can be used to preserve wetlands. The project consists of 98 townhouses gathered on upland portions of the site, with 90 acres preserved as open space. Destruction of wetlands at the site was limited to roads that crossed the wetlands at relatively narrow points. The developer was able to keep wetland destruction below ten acres.

The preserved wetlands in a cluster development provide attractive open space which enhances the

overall appearance and value of the site. In addition, the open space can be used for recreation, with the construction of walkways or paths around the wetlands to make them more accessible. In some cases, preserved wetlands can also provide a buffer between the property and surrounding development.

Preservation of Natural Vegetation

The preservation or construction of a vegetated buffer between a development and a wetland is an effective way of ensuring that the wetland's ability to process pollution is not overwhelmed by increased stormwater runoff from developed sites. Vegetation slows runoff, acts as a pollution filter and stabilizes soil to prevent excessive erosion (see Figure 10). Buffers generally range from 25 to 100 feet in width. Georgia's Erosion and Sedimentation Control Act requires a minimum setback of 25 feet. Buffers should be larger in areas with steep slopes, minimal natural vegetation, low soil permeability, or shallow soil depth.

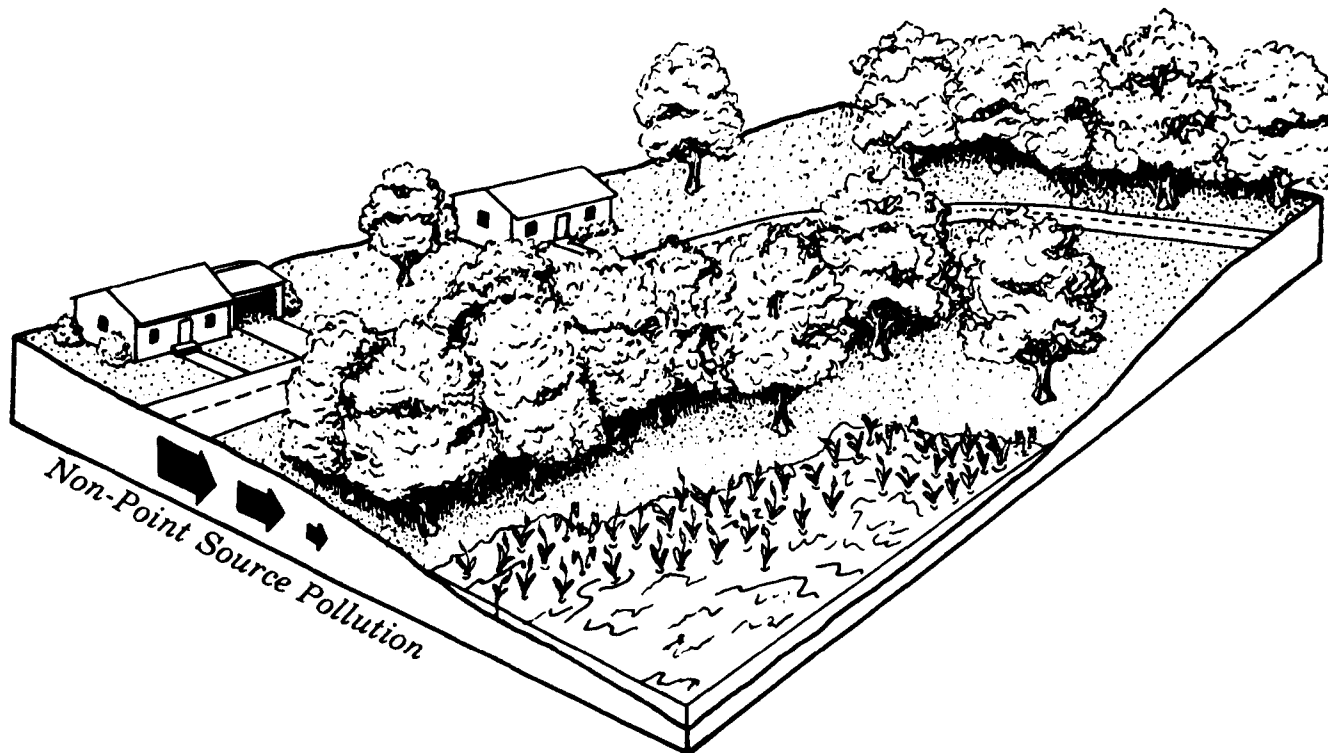
The preservation of as much natural vegetation as possible can often reduce costs of construction, provide a more interesting landscape and preserve habitat for local species. Vegetation can be threatened by adjacent construction even if the developer wishes to preserve it. It is often damaged or destroyed through compaction of the soil by construction equipment. This can best be avoided by carefully delineating areas to be preserved, using flagging (brightly colored plastic tape tied to vegetation to be preserved), signage, or fences. Additionally, the builder should avoid using preserved vegetated areas as storage depots for construction

material. The compaction of soil that results from the weight of some materials kills tree root systems as effectively as outright removal of the soil. When excavating near trees, it is a general rule that exca-

vation should not extend beneath the tree's canopy (see Figure 11).

Vegetated buffers have been prominently fea-

VEGETATED BUFFERS



A vegetated buffer between a developed site and a wetland slows stormwater runoff into the wetland and filters out pollutants. Leaving natural vegetation in place enhances the visual appeal of the site by making the landscape more varied and interesting, and provides habitat for local species.

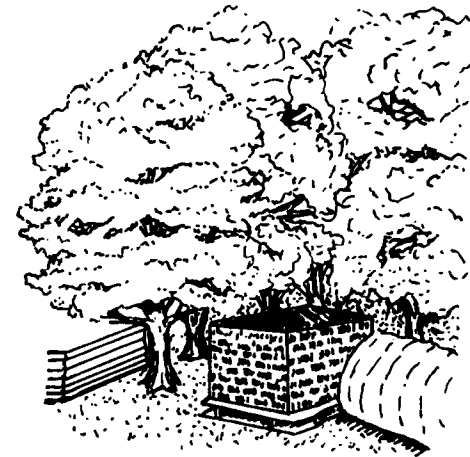
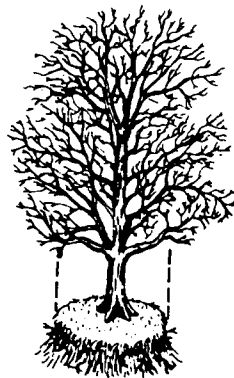
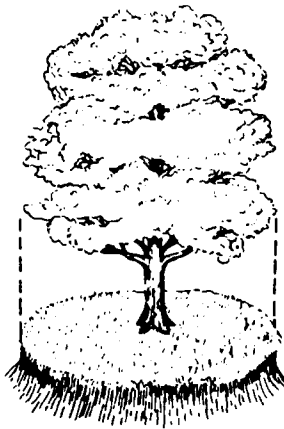
Figure 10

tured in many developments. One example is the award-winning design of McCormick Woods, a residential development in Port Orchard, Oregon. In

this case, the developer preserved a 100-foot buffer of native vegetation between on-site wetlands and the development's golf course. In addition, a wild-

PRESERVATION OF TREES

When attempting to preserve a tree, any excavation near the tree should not extend beneath the tree's canopy. Otherwise, vital root systems are likely to be damaged or destroyed, leading to the death of the tree.



Storing building materials beneath trees scheduled for preservation can lead to compaction of soil over vital root systems and the inadvertent destruction of the trees.

Figure 11

life sanctuary was established and restrictive covenants were used to protect wildlife from predatory pets and to limit the use of pesticides and fertilizer.

Runoff, Erosion and Sedimentation

A number of techniques can be used to reduce or redirect runoff caused by the development of a site

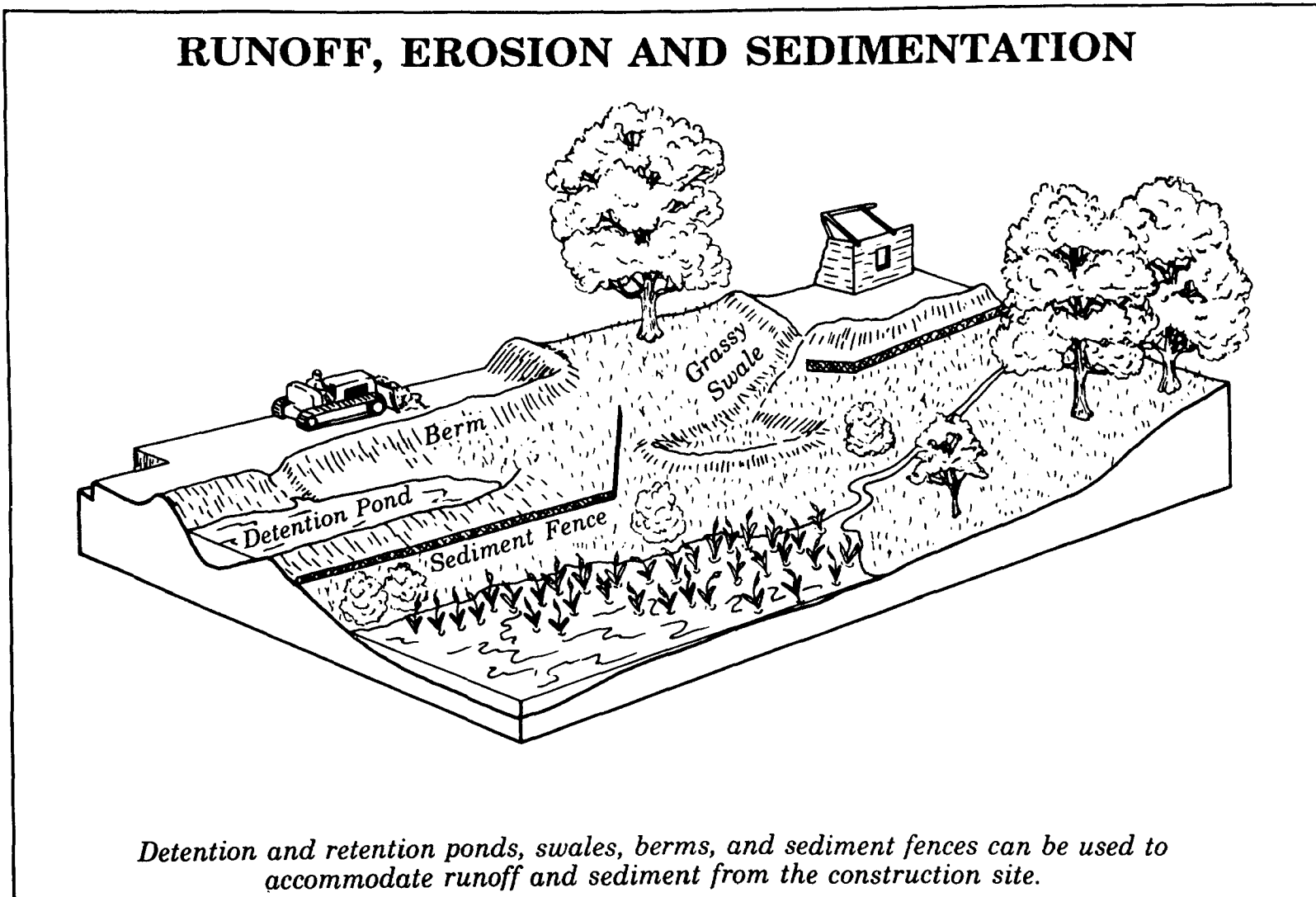


Figure 12

and trap sediment before it reaches wetlands or other water bodies. Grassed swales, berms, retention depressions and detention ponds can be used to slow runoff, allowing much of it to soak into the

ground or to evaporate (see Figure 12). As far as practicable, the site design should conform to the natural contours of the land and drainage structures should correspond to natural drainage pat-

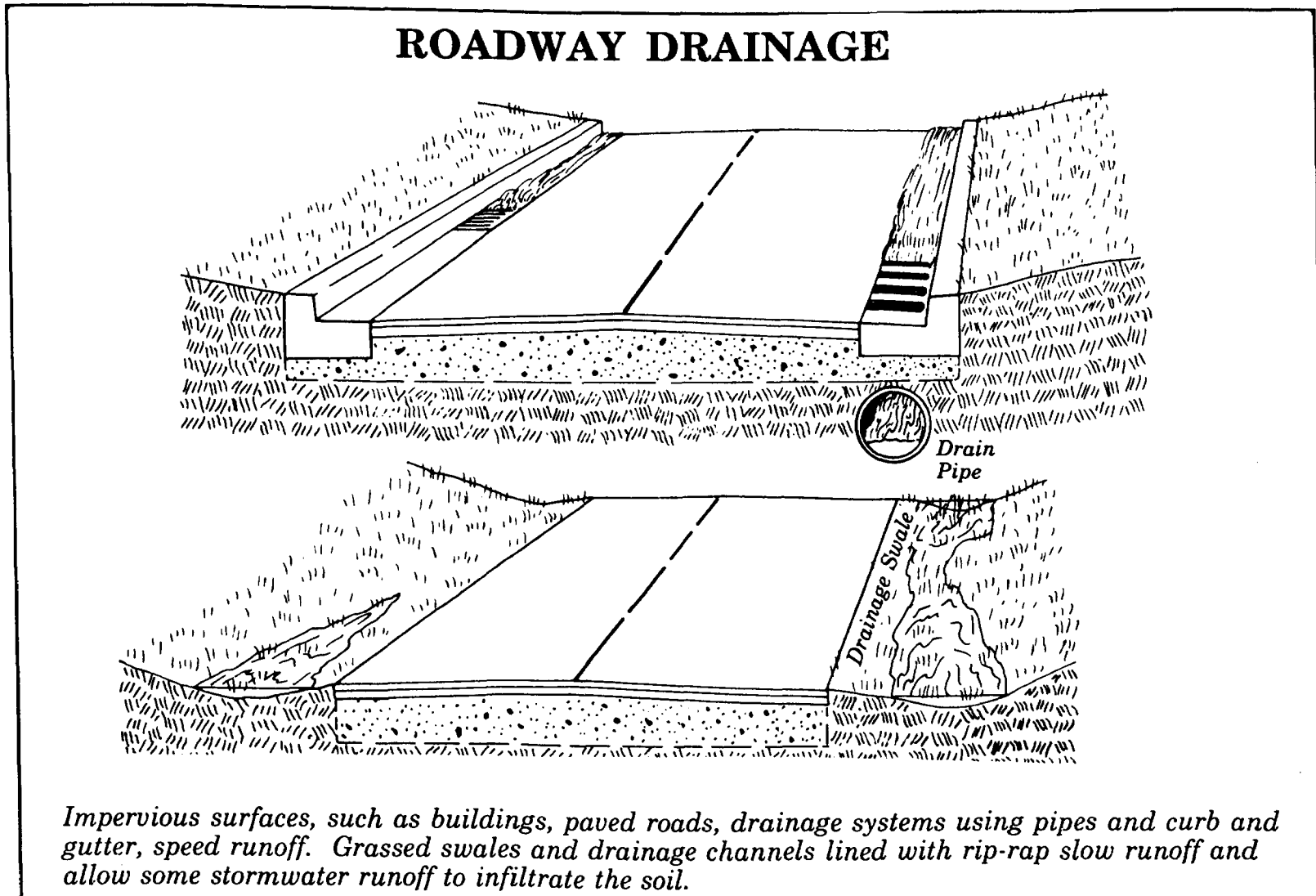


Figure 13

terns. Impervious drainage structures, including curb and gutter, storm drains and pipes increase stormwater runoff. Grassy swales or drainage ditches lined with rip-rap increase runoff to a much smaller degree than impervious drainage infrastructure (see Figure 13). In the case of the McCormick Woods Project, on-site lakes, ponds and streams were enlarged to control runoff and erosion. Retention ponds are often landscaped and preserved as permanent detention structures in site design (see Figure 14).

At Post Chastain, an apartment complex near Atlanta, more than half the site was left undeveloped. In addition, a detention pond was constructed to store post-development runoff and more than 100,000 native wetland plants were planted.

Erosion from a construction site that is close to a wetland can have severe impacts due to increased sedimentation. Appropriate measures must be taken to avoid such damage. Under the Georgia Erosion and Sedimentation Control Act, local governments are empowered to adopt ordinances governing land-disturbing activities within their boundaries. If the local government has not adopted these regulations, the state is responsible for enforcement of the Act.

A number of commonly used techniques can be employed to prevent sediment from an adjacent construction site from degrading a wetland. Measures include silt fences to halt sediment before it reaches the wetland and berms to direct and slow runoff. In cases where land is excavated but not immediately built upon, temporary vegetation should be planted on exposed subsoil to minimize

erosion. For large projects, it is generally a good idea to phase construction, thereby reducing the amount of land exposed at a particular time.

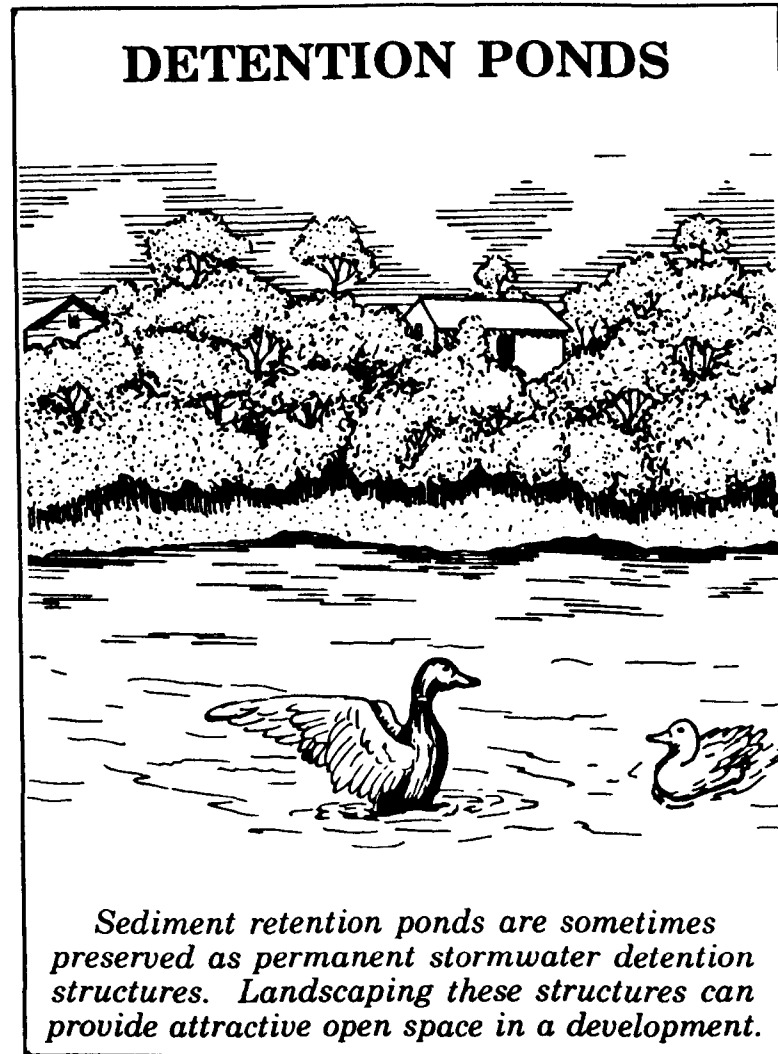


Figure 14

Minimizing Damage When Wetlands are Filled

In cases where impacts to wetlands are unavoidable, a number of techniques can be used to minimize the damage. Willingness to use these techniques may make it easier to acquire a Section 404 permit. A permit must be obtained from the Corps

of Engineers prior to starting construction. The permitting process is discussed in some detail in the next section.

A common problem when developing a site containing wetlands is access to all developable areas on the site. Uplands are often isolated by an inter-

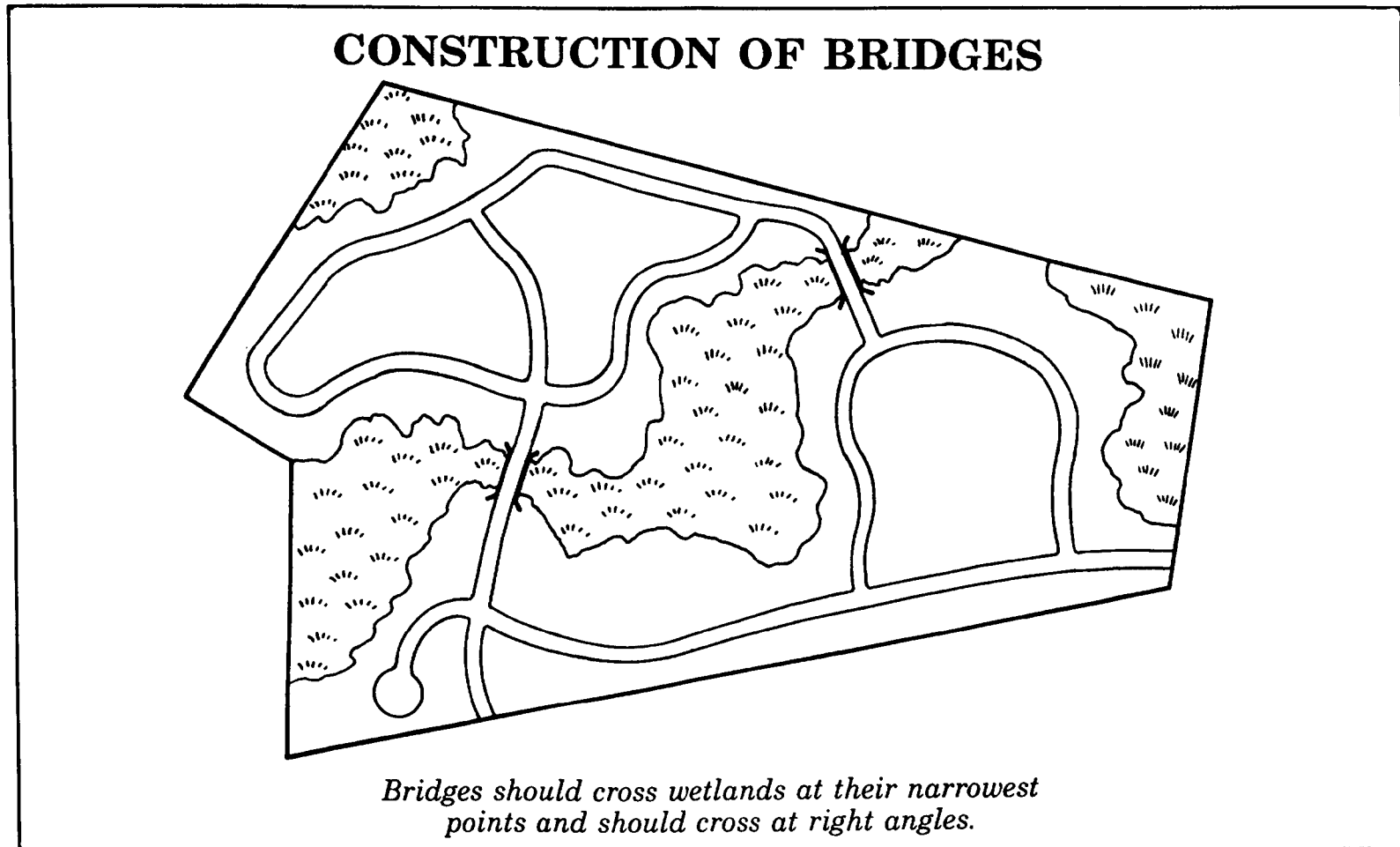


Figure 15

vening wetland. This make it necessary to construct roads that cross the wetland in order to make all upland areas accessible. These points of access should be located at the narrowest possible points and entrances and exits should be kept to a minimum. Bridges, rather than embankments, should be used to cross wetland areas. Bridges should also be constructed at right angles to the wetland to reduce the area of impact (see Figure 15).

Several construction strategies and techniques can be employed to minimize disruption. For example, when heavy equipment is moved through the wetland, large mats designed to withstand and more evenly distribute the weight of earth moving equipment can be laid down over soggy soil to minimize compaction of the soil.

In areas that serve as important breeding grounds and nurseries for fish or shellfish, discharges into spawning areas during spawning seasons should be avoided. Large projects should be built in phases, minimizing the amount of unvegetated soil present at a particular time, thereby lessening the amount of sediment being washed into the wetland. Sometimes, temporary dikes can be constructed to dry out a wetland while construction takes place.

Preservation, Restoration and Creation of Wetlands

In some cases, a Section 404 permit may be granted with the condition that compensation for wetlands destroyed during construction take place through restoration or enhancement of other wetlands. In rare cases, there may be a requirement

that new wetlands be created. However, this can be a complicated and expensive process and some controversy exists concerning the success of such efforts. The complexity of ecological and hydrologic systems within wetlands makes the creation of such systems difficult. Environmental consultants with experience in the field of wetland restoration are available and a list of these consultants can be provided by the U.S. Army Corps of Engineers District Office in Savannah. The U.S. Department of Agriculture and the Soil Conservation Service have published an Engineering Field Handbook that includes a chapter on wetland restoration, enhancement and creation.

Preservation of on-site wetlands is always the preferred option, although preservation of all wetland acreage is not possible in many cases. In the case of the Chapel Hill subdivision, a 500-acre planned unit development in Douglas County, the developer's site design avoided many of the wetlands in the area and set aside a 25-acre beaver wetlands area as an open space amenity for the community.

If it proves impossible to avoid all wetlands, the next preferred option is restoration of wetlands that have been degraded. Degradation may come through the use of wetlands as dumping areas for garbage and other waste, by overwhelming wetland systems with nutrients carried by agricultural or other runoff, or through removal of vegetation. Restoration may be as simple as removing debris and other sources of pollution, or may be a more complicated process, involving revegetating an area with naturally occurring plant species or replacing contaminated soil. It is recommended that this type of

work be carried out with the aid of a qualified environmental consultant.

The case of Southpark, an industrial park near Ellenwood, offers a good example of wetland restoration as a required mitigation strategy. The site design required that 4.5 acres of wetland be filled. As a mitigation measure, the developer was allowed to restore eight acres of wetland at another site, in Henry County. In cases where restoration is required, a 2:1 ratio is commonly, but not exclusively, used.

Federal and State Wetland Regulations

In recognition of the public value of wetlands, certain activities in wetlands are regulated by the government. The federal government regulates the discharge of fill material into wetlands through Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Restrictions on conversion of wetlands to agricultural uses are included in the so-called "swampbuster provisions" of the 1990 amendments to the Food Securities Act. Under the Coastal Marshlands Protection Act, Georgia regulates activities that would alter the state's tidal wetlands through a joint application program with the Corps of Engineers.

Federal Clean Water Act of 1977

The most important federal regulation for wetland protection is the Clean Water Act of 1977. Section 401 of the Act requires states to certify that any federally permitted activity that impacts waters of the state will not result in a violation of state water quality standards. Section 401 permitting is

administered by the Georgia Department of Natural Resources through its Environmental Protection Division. The acquisition of a water quality certification is generally a prerequisite for receiving a permit to develop in a wetland area.

Section 404 of the Act requires a permit from the Corps of Engineers for activities that involve the discharge of dredge or fill material into wetlands adjacent to navigable waterways and isolated wetlands one acre or more in size. In Georgia, this program is administered by the Corps regional office in Savannah. The U.S. Environmental Protection Agency regional office in Atlanta is in charge of enforcing the wetland provisions of the Clean Water Act in Georgia.

The Corps and EPA use the following definition of wetlands in administering Section 404 permitting: "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." A detailed and highly technical manual is used to determine if a particular site fits this general description. As a result, an accurate wetlands determination must be made by a representative of the Corps of Engineers or by a private consultant deemed qualified by the Corps. When the delineation has been performed by a consultant, the Corps is still required to verify the results. Presently, a pilot program for training biologists and engineers to perform wetland delineations is being conducted by the Corps in a few states. If the program proves successful, the procedure for wet-

lands delineation should be made less cumbersome and time-consuming in the near future.

A number of permissible activities under the provisions of Section 404 are noteworthy. Normal agricultural, silvicultural and ranching activities, including plowing, seeding and harvesting, are all permissible activities as long as they are part of an existing and ongoing operation. Activities that would convert an existing wetland to a new agricultural or developmental use are not permissible without a permit.

In addition to exemptions for normal agricultural and silvicultural activities, a Section 404 permit is not required for the maintenance of existing structures, such as minor drainage ditches and the construction of irrigation ditches and farm and logging roads, if there are no cumulative impacts on wetlands as a result of these maintenance activities. The use of best management practices (BMPs) for forest and agricultural road construction and maintenance is required by the Clean Water Act in order to qualify for this exemption (See Appendix F). The Georgia Forestry Commission has also published a guide to the use of Best Management Practices in forested wetlands, which is cited in the reference section of this guidebook.

The Permitting Process

Nationwide, the Corps of Engineers receives approximately 11,000 applications a year for Section 404. Of these applications, approximately three percent are denied. Another 14 percent are withdrawn by the applicants during the permitting pro-

cess. One-third of the applications are modified in order to address the concerns of the Corps and other federal agencies. Approximately 400 dredge and fill permit applications are made in Georgia each year. The majority of these are for nationwide permits, regional permits, or individual permits for minor construction.

In an effort to streamline the permitting and review process, the Corps issues four types of permits: letters of permission, nationwide permits, regional permits and individual permits. A detailed discussion of the Section 404 permitting process, along with suggestions on ways to expedite the process, is provided in Appendix A.

Letters of Permission

The Corps may grant a letter of permission for activities that would result in only a small impact on wetlands. These activities can gain approval by the Corps quickly because they are not required to go through the usual review process.

Nationwide Permits

The Corps has approved 40 nationwide permits for common activities that will have only a moderate impact on wetlands (see Appendix B). Activities that fall within specific categories, such as bank stabilization and temporary construction and access, can qualify for a nationwide permit. The most widely used nationwide permit is Nationwide Permit 26, which can be issued for activities involving the filling of less than ten acres of wetlands. A project must meet one of several criteria in order to qualify for Permit 26. These criteria include

wetlands located adjacent to that portion of the stream that is above the headwaters. Headwaters are defined as the portion of the stream with an annual average flow of less than five cubic feet per second (cfs). Activities that adversely affect historical or archeological resources pursuant to Section 106 of the National Historic Preservation Act cannot qualify for nationwide permits. Activities that qualify for a nationwide permit do not have to go through the regular review process and can be approved in a short period of time. No public notice is required when a project qualifies for Permit 26.

Regional Permits

Regional permits are issued by the Savannah office of the Corps and remain in effect for five years, unless the Corps feels that more than minor impacts are involved. In these cases, the Corps may opt to review the permit within a shorter period. Currently, there are eleven outstanding regional permits (see Appendix C). A wide range of activities have been covered by regional permits, including road and bridge construction, public boat ramp construction and placement of public water intakes.

Individual Permits

Projects that may have a substantial impact on wetlands must receive an individual permit. All applications for individual permits must go through the public interest review process (see Figure 16). Federal and state agencies and the general public will have an opportunity to comment on the application and in some cases, a public hearing will be held. The Corps will then use a set of criteria to determine if the project is in the public interest. The

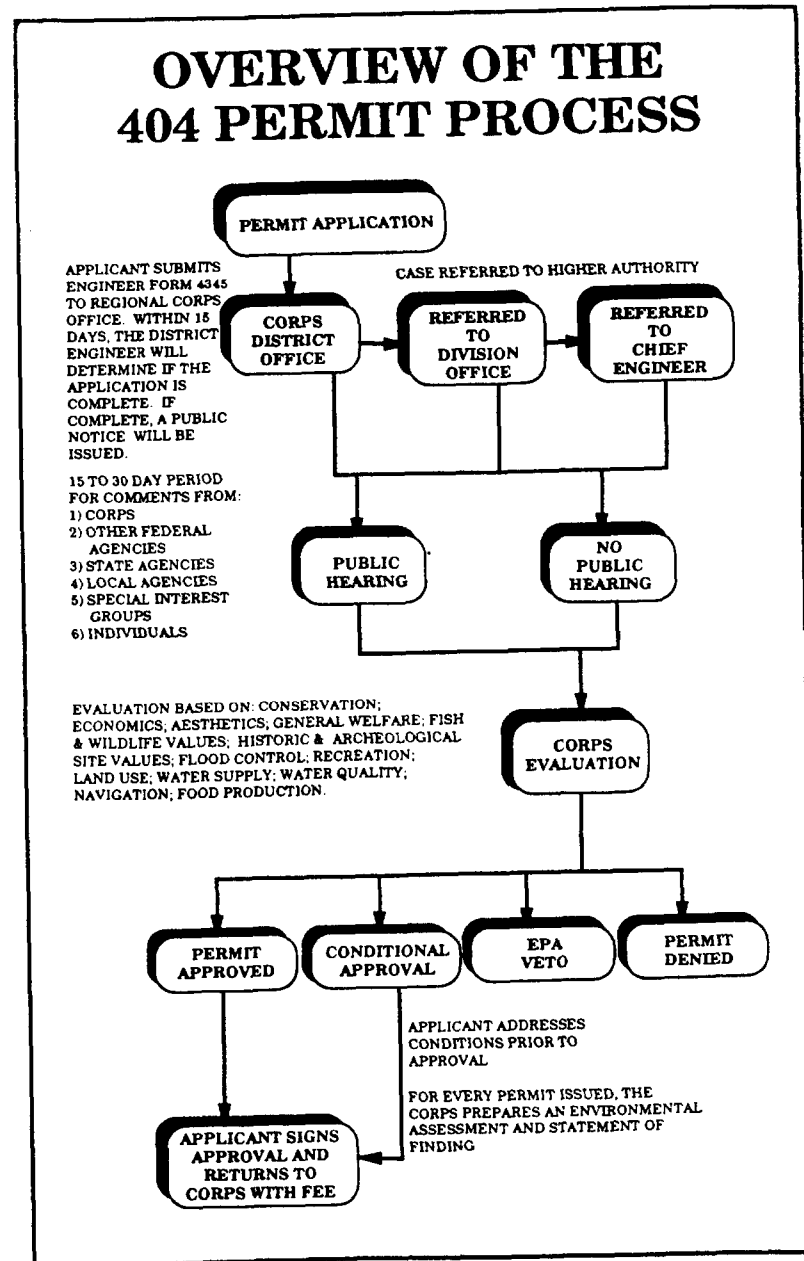


Figure 16

Environmental Protection Agency plays a large role in the review process and has the power to veto a decision made by the Corps.

Georgia Coastal Marshlands Protection Act

A permit must be obtained from the State of Georgia for activities that alter coastal marshlands. Coastal marshlands are defined as any marshland or saltmarsh "lying within a tide elevation range five and six-tenths (5.6) feet above mean tide level." A determination of whether a particular property includes coastal marshlands can be performed by the Coastal Resources Division of DNR, located in Brunswick.

Activities that are regulated include the dredging, filling and draining of these marshlands. The building of private walkways or docks by the owners of adjacent high land does not require a permit if the structures do not obstruct the flow of water. In addition, some activities of the federal government, the Georgia Department of Transportation, local governments, public utilities and railroad companies are exempt from coastal marshlands regulation.

Most activities in coastal marshlands also require a Section 404 permit from the Corps. A joint application can be filed with the State of Georgia and the Corps for projects in coastal marshlands. All applications will be reviewed by the Coastal Marshlands Protection Committee at a public meeting. The applicant must show that the proposed activity is not contrary to the public interest and that there are no alternative sites for the project.

The Section 404 Permitting Process

Following a determination that wetlands are present at a site, the next step is accurate mapping of wetland boundaries. Delineation of the wetlands can be carried out by a representative of the Corps. There is a long waiting list for wetland determinations, so many landowners prefer to hire a Corps approved independent consultant to make the determination. Although final determination must be carried out by the Corps, submittal of a report by a qualified consultant will ensure that a request for delineation of wetlands receives priority. In such cases, the Corps will generally "spot check" the consultant's determination rather than reproducing the consultant's work in detail.

The next step in the process is the submission of a preliminary site plan to the Corps. Projects that qualify for letters of permission, nationwide permits, or regional permits may be exempted from submission of a complete application. Projects that do not qualify for a letter of permission, nationwide or regional permit require an individual permit.

It is strongly suggested that a pre-application meeting with Corps representatives be scheduled. This will allow an exchange of ideas concerning the project and can reveal ways of addressing potential problem areas that the developer had not previously considered. Inclusion of interest groups likely to have objections to the project can also facilitate the process and lessen objections that may be raised once the application has been made. This proved to be a very effective strategy in the case of the Crossroads Business Center, located in Savannah. This development is a mixed-use business/industrial cen-

ter sited on 1,784 acres of woodlands. Under a revision of the definition for jurisdictional wetlands in 1989, the site was found to be approximately 85 percent wetlands. Pre-application meetings with the Corps and with representatives of environmental interest groups led to the design of a mutually acceptable site plan and helped avoid a lengthy and potentially costly battle over the project.

A two-page form, Engineering Form 4345, must be submitted to the Corps district office when applying for an individual permit. Information must be provided about the type of activity planned, the purpose of the activity, names and addresses of adjoining property owners and a list of other authorizations required by federal, state and local agencies. In addition, a vicinity map, a plan view and an elevation or cross-sectional view must be submitted.

Within 15 days, the Corps will issue a public notice of the application and a period of 30 days will be reserved for comment by the public, interest groups, and federal, state and local agencies. A public hearing on the application can be requested by any individual, interest group, or agency that comments on the application.

After the public review process is completed, the Corps will make a decision on the application. The district engineer can issue a permit, request that certain conditions be met or revisions be made to the site plan as a prerequisite to permit issuance, or deny the permit. It is important to note that the Environmental Protection Agency may veto Corps decisions on permit applications, and the Advisory Council on Historic Preservation must be afforded

an opportunity to comment on any activity that would affect an archeological site or historic building.

A "statement of findings" or "record of decision" will be issued by the district engineer. A fee of \$10 is charged for non-commercial projects and a fee of \$100 is charged for commercial projects when the permit is issued.

For a more detailed discussion of the 404 permitting process, see Appendix A. Methods for expediting the permitting process and a discussion of the requirements of Georgia's Coastal Marshland Protection Act are included.

The Food Securities Act of 1985 and the Food, Agricultural, Conservation and Trade Act of 1990

The Food Securities Act of 1985 and the Food, Agricultural, Conservation and Trade Act of 1990 include certain provisions with respect to wetlands that are commonly referred to as the "swampbuster provisions." Under these provisions, eligibility for all U.S. Department of Agriculture (USDA) programs is denied to farms that convert wetlands to croplands. These programs include USDA crop support payments, disaster payments, crop insurance, Farmers Home Administration loans, Commodity Credit Corporation storage payments, farm storage facilities loans, Conservation Reserve Program payments and other programs under which payments are made to the farmer with respect to commodities produced. The U.S. Soil Conservation Service performs wetland determinations on lands receiving USDA benefits.

Watershed Protection

What is a Watershed?

A watershed is the total drainage basin of a river or stream (see Figure 17). Major streams are often used as sources for municipal water supplies and impoundments and reservoirs are commonly constructed for that purpose. The protection of water

quality within the watershed is, therefore, of considerable importance to public health and welfare.

Over 50 percent of all Georgians get their drinking water from rivers and reservoirs. The area of a watershed that occurs upstream of a public water intake is known as a "water supply watershed." Water supply watersheds are particularly important in north and central Georgia, where surface water is

WHAT IS A WATERSHED?

A watershed is the total drainage area of a stream. In the illustration to the right, the boundaries of the watershed are delineated by the ridge lines to the east, west, and north of the river. The streams of the watershed originate on the slopes of the ridges.

A water supply watershed is a watershed used as a public water source. The "critical area" of the water supply watershed is the portion of the watershed located within a 7-mile radius upstream of a public water intake. Development upstream of a public water intake, chiefly from non-point source pollution, can have severe impacts on water quality.

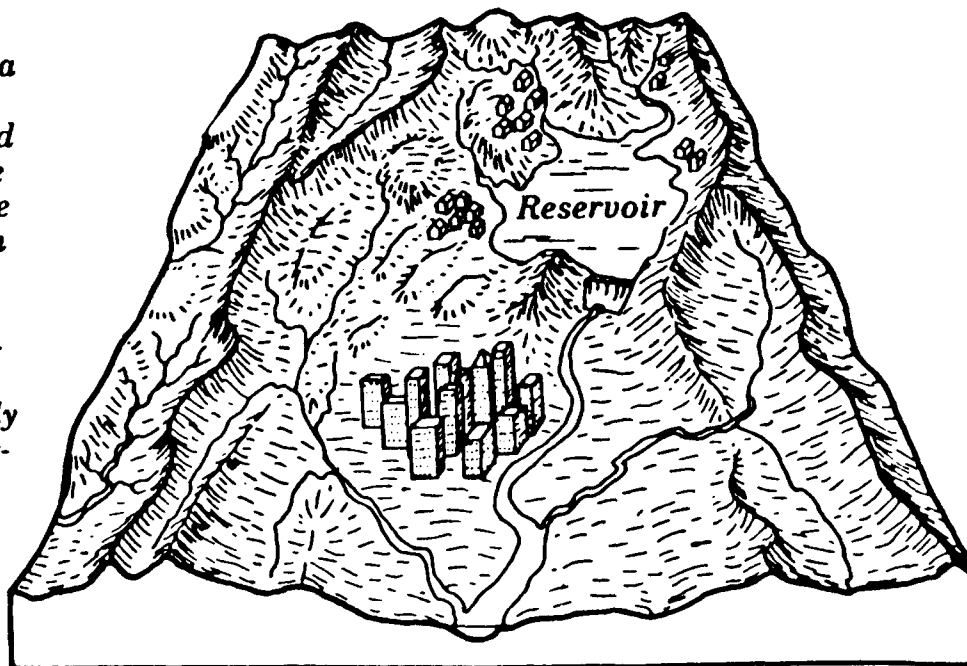


Figure 17

the primary source of water (see Figure 18).

Why Should Watersheds Be Protected?

Intensive development of land within a watershed can have severe consequences for water quality and can increase the costs of treatment. Sources of pollution may be so-called "point sources," which are discrete and relatively easy to identify, such as discharge from a wastewater treatment facility, or

may be "nonpoint sources," which are difficult to pinpoint because they consist of pollutants that collect over broad areas and are carried to water bodies by stormwater runoff (see Figure 19). Nonpoint source pollution is increased by development because the pollution sources increase and because impervious surfaces, such as roads, driveways and parking lots prevent infiltration of stormwater into the soil and accelerate the rate of runoff. These surfaces accumulate thin veneers of pollution from automobile exhausts, crankcases and other sources that are carried into streams and reservoirs by stormwater runoff.

The undeveloped areas of a watershed provide a large, permeable surface into which some stormwater runoff infiltrates. Additionally, low areas in the watershed act as retention ponds, slowing runoff. Runoff is further slowed by the presence of vegetation, which functions as a natural filter for pollutants. The increased amount of impervious surface (structures and pavement) associated with development disrupts these processes. Rain falling on these surfaces may be carried directly into the water body without being slowed by plants and retention areas. This results in higher water levels than would otherwise occur and increases the chances of flooding in downstream areas. It also increases erosion and sedimentation.

How to Determine if Your Property is Located in a Water Supply Watershed

The majority of water supply watersheds are located in the mountain and piedmont regions of the state. Local governments within the state's coastal plain rely much more heavily on groundwater re-

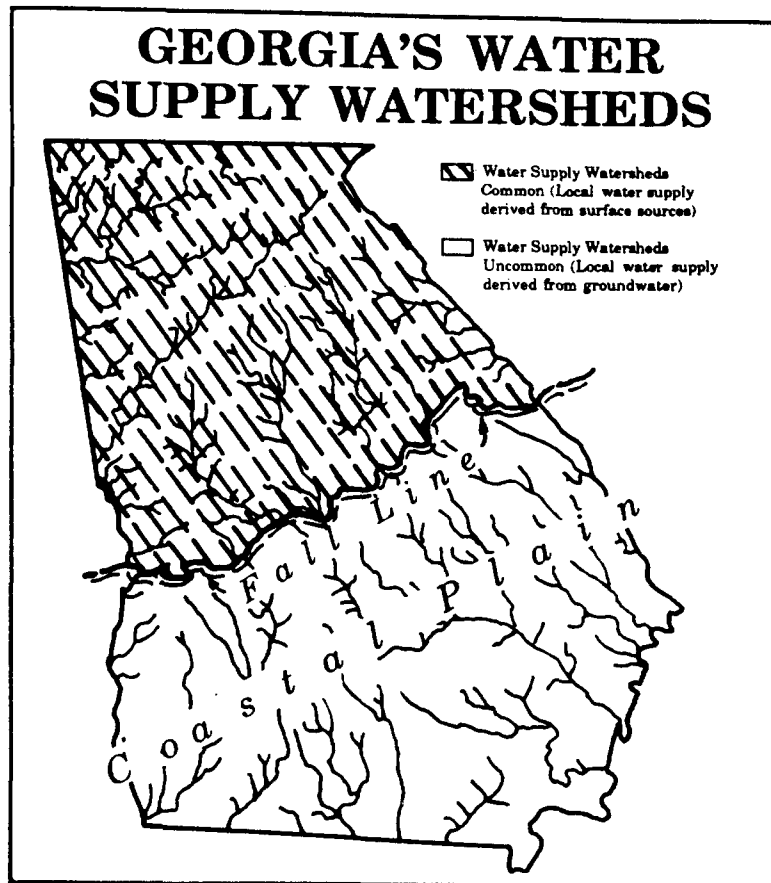


Figure 18

sources as their sources for public water. By state definition, the area extending seven miles upstream of a water supply intake is a "vital area" requiring greater protection than the remainder of the watershed. Maps of water supply watersheds may be available at the regional development centers.

Planning criteria for water supply watersheds have been established by the Georgia Department of Natural Resources, to be used by local governments when developing their comprehensive plans. These criteria include a series of recommended limitations on development. Many local governments

COMMON SOURCES OF NON-POINT SOURCE POLLUTION

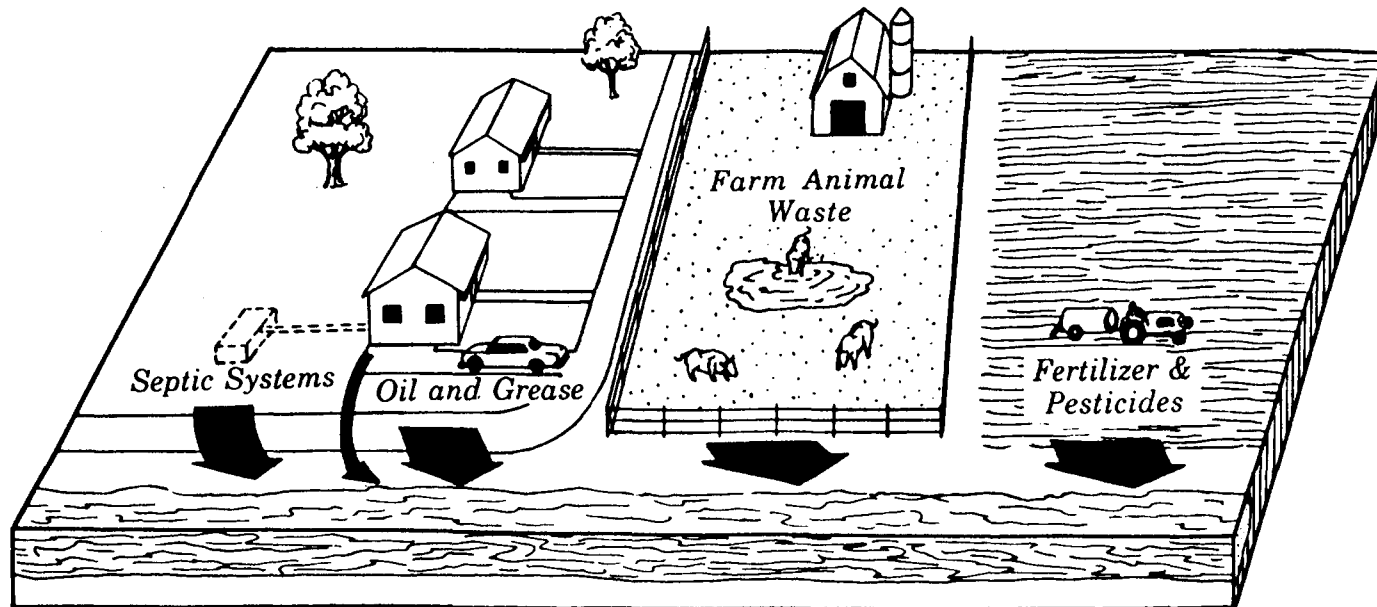
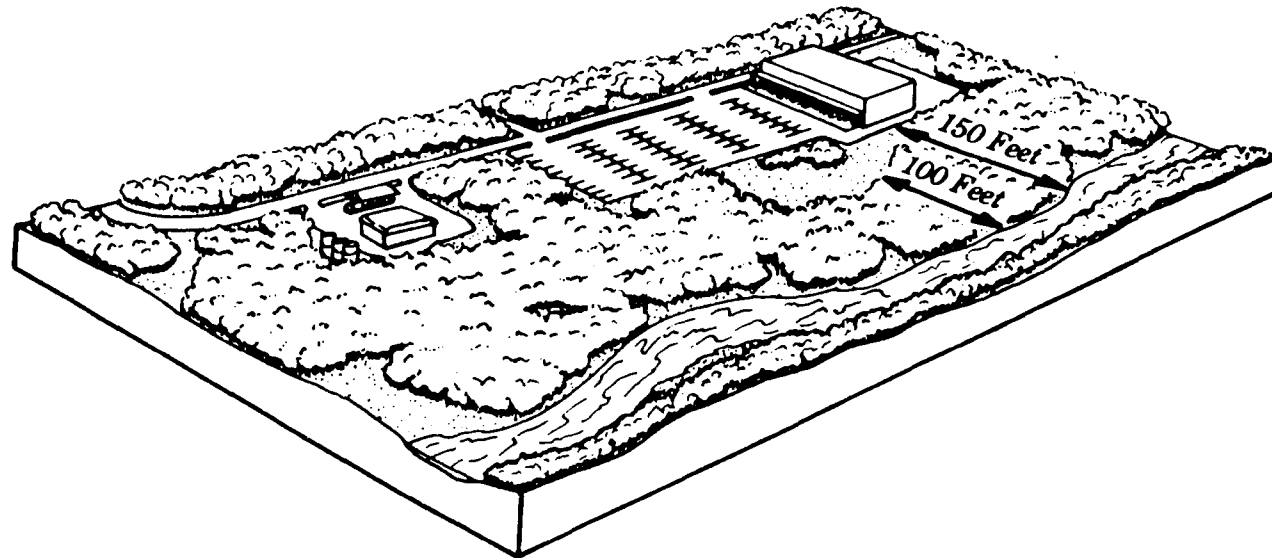


Figure 19

have chosen to adopt these criteria as policies within their comprehensive plans and to incorporate them into their land use regulations. Therefore, it is important to become familiar and comply with local development regulations with respect to water supply watersheds.

The criteria differentiate between "large" water supply watersheds, which have an area equal to or greater than 100 square miles, and "small" water supply watersheds, which encompass less than that. For both large and small watersheds, the criteria vary between the "critical area," which lies within a seven-mile radius of the intake or reservoir

SETBACKS WITHIN WATER SUPPLY WATERSHEDS



In large water supply watersheds, impermeable surfaces should not be placed within 100 feet of a perennial stream and 150 feet of a reservoir. For small water supply watersheds, a distance of 150 feet between impervious surfaces and the waterbody should be maintained inside the "critical area" (within a seven-mile radius of the intake) and 75 feet outside it.

Figure 20

and the remainder of the watershed. Within the seven-mile radius, the development limitations for both large and small water supply watersheds call for a natural or enhanced vegetative buffer, with a setback of 100 feet from the banks of a perennial stream and a setback of 150 feet from a reservoir, measured from the normal bank elevation. No impervious surfaces are allowed within a 150 foot setback from the water resource. Within the setback, septic tanks and septic fields are prohibited (see Figure 20). Operations involving the transport, handling, or storage of hazardous materials must be performed on an impermeable surface with spill and leak collection systems approved by DNR.

For small water supply watersheds, there are additional criteria for the watershed outside the seven-mile radius. The setback for impervious surface in this area is 75 feet and the vegetative buffer width is 50 feet. The total impervious surface within a small water supply watershed cannot exceed 25 percent. Septic tanks and drainfields cannot be installed within 100 feet of the banks. In addition, there are criteria for landfills and hazardous waste and disposal sites. New municipal landfills are required to have synthetic liners and leachate collection systems. New hazardous waste treatment and disposal facilities are prohibited and existing facilities are required to perform their operations on impermeable surfaces with spill and leak collection systems approved by DNR.

Developing Property in a Watershed

There are a number of actions that can be taken to reduce the impact of development on watersheds. For example, many communities have adopted reg-

ulations that prohibit new development from exceeding pre-development levels of pollution loading and stormwater runoff. However, this "performance standards" approach is not always practical for a local government, particularly if local government personnel lack the expertise or equipment necessary to monitor development for compliance. Another approach places restrictions on actions that are likely to have detrimental impacts on water quality. This is the approach reflected by the DNR criteria for water supply watersheds. It has the advantage of simplicity in monitoring and enforcement. The following list illustrates this approach.

1. The portion of the site covered by impervious surfaces should be minimized. As previously discussed, buildings and paved surfaces cover the land and prevent rainwater from seeping into the ground, resulting in increased stormwater runoff. Some local governments regulate the percentage of a site in a watershed that may be covered by impervious surfaces. DNR planning criteria recommend that no more than 25 percent of the total surface area of a water supply watershed be covered by impervious surface. One way to preserve desired overall floor-area while avoiding an increase of impervious surface is through the use of multiple stories for buildings.

Parking lots and driveways often account for a large proportion of the impervious surface in an area. Parking areas that use gravel or other porous material are preferable to asphalt or concrete in this respect. In some cases permeable pavement can be used for driveways, patios and walkways.

2. Runoff from a site should be controlled and re-

duced. Assuming that the area downslope of an impervious surface is already vegetated, it should be, as far as practicable, left undisturbed as a buffer for

stream channels or other water bodies. Vegetation effectively slows runoff and allows more of it to infiltrate the soil. Grassed swales can also be used to

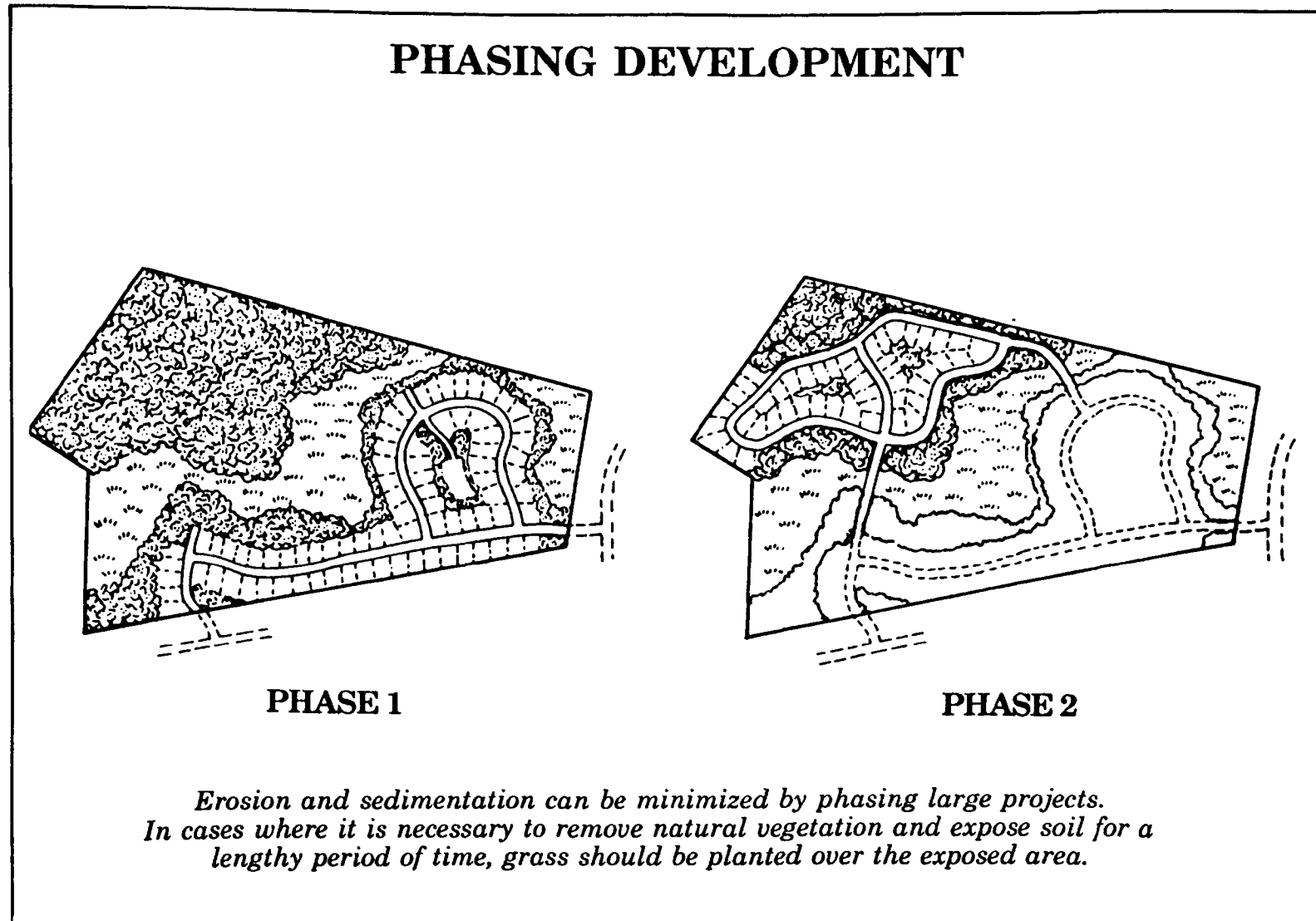


Figure 21

slow runoff. These channels can be used in conjunction with retention basins (See Figure 12). Sediment ponds are often constructed to hold runoff during construction. These ponds can be incorporated into the site design as a permanent, attractive amenity. In areas with steep slopes, runoff can be reduced by the construction of terraces. As with sediment ponds, these terraces can be designed and landscaped in an attractive fashion that enhances the overall site design. Buildings and other impervious surfaces should be set back from stream channels and reservoirs. Locally required setbacks may vary and the developer should check with the local government for these and other requirements.

3. The risk of point source pollution should be minimized. Land uses involving the handling, storage or manufacture of toxic chemicals should be avoided in watershed areas. If above-ground storage tanks for toxic materials are constructed, they should have spill and leak collection systems. Large storage tanks should also have secondary containment capable of containing 110 percent of the volume of the tank.

4. Soil erosion in watersheds should be minimized. Virtually any construction involves some removal of natural vegetation and excavation. This increases erosion and can have severe impacts on water quality in nearby streams. Generally, local governments have regulations that are designed to minimize erosion from construction sites.

As in the case of wetlands protection, a number of measures can be taken to reduce erosion and sedimentation. These include the use of silt fences to prevent sediment from leaving the site, construc-

tion of temporary berms to collect and channel runoff and the construction of sediment basins to act as reservoirs for runoff and sediment. When graded surfaces are to be exposed for a considerable amount of time, planting grass or other temporary vegetation can minimize erosion. Phasing large projects, so that a minimum of erodible soil is exposed at a particular time, can also be effective (see Figure 21).

Conclusion

This guidebook has explained what wetlands and water supply watersheds are and why they should be protected, how the permitting process for development in wetlands works and techniques of design and construction that can be used to minimize the negative impacts of development upon wetlands and water supply watersheds. It is our hope that the information provided will aid the landowner and small-scale developer in avoiding potentially expensive delays in the acquisition of permits while promoting the preservation of these ecologically important environments.

APPENDIX A

A Guide to the Section 404 Permitting Process and Georgia Coastal Marshlands Protection Act

Delineation of Jurisdictional Wetlands

After it has been established that wetlands are likely to be present at a site, a formal determination and delineation must be carried out by the Corps of Engineers prior to the beginning of a project. A request form, accompanied by a map showing the location and boundaries of the property, must be submitted to the Corps district office. A member of the Corps staff will visit the site and identify the portions that are jurisdictional wetlands subject to Section 404. The Corps receives a large number of requests and there is often a long waiting list for jurisdictional determinations. Time can be saved if a preliminary wetlands determination is made by a professional consultant. While this cannot take the place of an official determination made by the Corps, requests that include a preliminary determination are given priority. The consultant should be familiar with the Corps wetlands delineation manual and the 404 permitting process. A list of qualified consultants in Georgia who will conduct wetlands determination is available from the Corps office in Savannah. A list of the minimum requirements for wetlands determinations is also available from the Corps regional office. The Corps staff will review the preliminary determination and will decide to accept it or to conduct their own determination.

Following a determination that wetlands are present, a preliminary site plan should be submit-

ted to the Corps. The Corps may not require submission of a complete application for projects that qualify for letters of permission, nationwide permits or regional permits. A letter stating the basic information about the proposed activity may be sufficient.

If a project does not qualify for a letter of permission, nationwide permit, or regional permit, an individual permit must be obtained. It is strongly suggested that a pre-application meeting with the Corps be requested. At the meeting, the applicant will have the opportunity to explain the site plans and the Corps will have an opportunity to respond to the plan and explain concerns. Modifications to the site plan designed to bring the plan into compliance with Corps guidelines can be made following the pre-application meeting.

Submittal of a Permit Application

The individual should submit a formal application for the appropriate permit. A two-page form (Eng. Form 4345), available from the Corps office in Savannah, serves as the application. The application must include a description of the activity, the purpose of the activity, names and addresses of adjoining property owners, a list of authorizations required by other agencies (federal, state and local) and other important information adequate for public notice. Three maps, including a vicinity map, a plan view and an elevation and/or cross-sectional view, must be included with the application. Detailed engineering plans and specifications are not required.

Application Review Process for Individual Permits

Fifteen days after an application is received, the Corps will issue a public notice of the application. Following public notice, a period of 30 days will be reserved for comments on the application. The appropriate local government, the state Department of Natural Resources, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and the Environmental Protection Agency will have the opportunity to submit comments to the Corps. Interested individuals and groups will also have the opportunity to submit comments on the application. In order for an application to be approved, the Georgia Department of Natural Resources must certify that the project will comply with state water quality standards.

Any individual or government department can request that the Corps hold a public hearing on the application. Public hearings are typically scheduled for projects that would have a large impact on wetland areas. At the hearing, the applicant has an opportunity to present plans for the proposed activity and to respond to any concerns raised at the meeting. Following the comment period, the applicant is given an opportunity to respond to the concerns that have been raised. The applicant may wish to modify the plans for the project in order to further address concerns.

Review Criteria

The Corps of Engineers uses a variety of criteria to evaluate an application, including the following:

1. The proposed project must be the least environmentally damaging and most practicable alternative. All alternatives, including different locations and site plans, must be considered. Undeveloped sites that are not presently owned by the applicant must be considered.
2. A development that is not water-dependent will not be approved by the Corps unless the applicant can clearly demonstrate that there are no alternatives to the site and the site plan.
3. The development must not contribute to the significant degradation of water quality.
4. Twenty evaluation factors are used to determine if the project is in the public interest. These include:
 - Conservation
 - Flood Hazards
 - Water Conservation
 - Economics
 - Floodplain Values
 - Energy Needs
 - Aesthetics
 - Land Use
 - Safety
 - Environmental Concerns
 - Navigation
 - Food Production
 - Wetlands Impacts
 - Erosion/Accretion
 - Public Welfare
 - Historic Properties
 - Recreation
 - Mineral Needs
 - Fish/Wildlife Values

Water Quality/Supply

5. In the case of a large project, the Corps may require the applicant to compensate for the wetlands that are destroyed. This can be done by the restoration or enhancement of other, generally adjacent, wetlands or, in rare cases, creation of new wetlands on the site or a nearby site. Compensation can include the enhancement or restoration of an existing wetland that has been altered by previous development. The preservation of existing wetlands can also be viewed as appropriate compensation in some cases.

Decision

After the public review process has been completed, the Corps District Engineer will make a decision on the application. The District Engineer can decide to issue a permit, issue a permit with conditions, or deny a permit. The EPA is authorized to veto the Corps decision to grant a permit. A fee of \$10 for a noncommercial use and \$100 for a commercial use is charged for issuance of a permit. The District Engineer will prepare a "statement of findings" or, in cases where an environmental impact statement has been prepared, a "record of decision."

These will include the district engineer's views of the project impacts.

Simplifying the 404 Permitting Process

1. Obtain a wetlands determination from the Corps or from a private consultant prior to development of a site plan. An early determination is likely to save time and money.

2. The preferred option is to avoid activities that would involve the discharge of dredge or fill materials into wetlands, thus negating the need for undergoing the sometimes lengthy permitting process.

3. If the filling of wetlands cannot be avoided, try to minimize the impact on the wetland. A commitment to minimizing the impact of development to wetlands will more likely result in a successful permit application.

4. After preliminary plans have been formulated, contact the Corps of Engineers to determine which permit will be needed for your plan. For larger projects, request a pre-application meeting with the Corps to discuss site plans.

5. Address the review criteria in your application. For example, show that the plan is the least environmentally damaging, practicable alternative available.

Georgia's Coastal Marshlands Permitting Process

Prior to developing in a coastal marshland, contact the Coastal Resources Division of the Department of Natural Resources in Brunswick. A determination of the existence and extent of the marshlands can be made by a member of the staff. A pre-application meeting can be held to discuss the plans for the property. Such a meeting may involve a site visit by a member of the Division staff. The staff will generally work with the applicant to come up with a plan that is acceptable to the applicant and to the Division.

When the plans for the site have been formalized, a complete application for a coastal marshlands permit must be submitted. The application form can be obtained from the Ecological Services Section of the Coastal Resources office in Brunswick. The application must include a location map, drawings of the plan and a copy of the deed to the property. The completed application should be submitted to the DNR office in Brunswick. An application fee of \$25 for every acre of marshland to be affected is used to fund the administration of the permitting program.

In the vast majority of situations, an activity that requires a state permit will also require a federal 404 permit. A copy of the state application can be submitted to the Corps of Engineers. If the project will involve the use of state owned marshlands, the applicant must get approval from DNR. A cover letter and a copy of the full application must be submitted to the Real Estate Unit of DNR in Atlanta.

In some cases, the Corps of Engineers will require that a water quality certification be obtained from the Environmental Protection Division of DNR. A list of addresses and telephone numbers of important state and federal agencies is included in Appendix D.

The Review Process

The application will be reviewed by DNR's Coastal Marshlands Protection Committee in a public meeting. This committee is composed of the Commissioner of Natural Resources and two citizens from Georgia's coastal counties. The staff of the Coastal Resources Division will make a recommen-

dation on the application to the Committee. The applicant will then have the opportunity to present the proposal to the Committee.

The Committee uses the following criteria to evaluate an application:

1. In most cases, activities that are not water dependent will not be approved.
2. A permit will generally not be granted unless there are no alternative upland sites available for the project.
3. The Committee uses three additional criteria to determine if a proposed activity is in the "public interest." The activity must not obstruct the flow of navigational water. The activity must not lead to increased erosion, the shoaling of channels or the creation of stagnant waters. The activity must not interfere unreasonably with natural resources such as marine life, other types of wildlife and water and oxygen supply.

APPENDIX B

Nationwide Permits under Section 404 of the Clean Water Act

* 401 water quality certification not required.

** 401 general certification denied, individual certification required.

<u>Nationwide Permit</u>	<u>Water Quality Cert.</u>	<u>Purpose</u>
1	*	Aids to navigation
2	*	Structures in artificial canals
3	2745	Maintenance
4	2745	Fish and wildlife harvesting, enhancement and attraction devices and activities
5	2745	Scientific measurement devices
6	2725	Surveying activities
7	2745	Outfall structures
8	*	Oil and gas structures
9	*	Anchorage structures
10	*	Mooring buoys
11	*	Temporary recreational structures
12	2664	Utility line backfill and bedding
13	2665	Bank stabilization
14	2732	Minor road crossings
15	2667	U.S. Coast Guard approved bridges
16	2668	Return water from upland contained disposal areas
17	**	Hydropower projects
18	2733	Minor discharges
19	*	Dredging activities involving 25 cubic yards or less
20	2745	Oil Spill Cleanup
21	**	Surface coal mining activities
22	2745	Removal of vessels

Landowners' Guide to Wetlands and Watersheds

(CONTD)

<u>Nationwide Permit</u>	<u>Water Quality Cert.</u>	<u>Purpose</u>
23	2734	Approved categorical exclusions
24	*	State administered Section 404 programs
25	2745	Structural discharge
26	2671	Headwaters and isolated wetlands
27	2745	Wetland and riparian restoration and creation projects
28	*	Modifications to existing marinas
32	2745	Completed enforcement actions
33	2727	Temporary construction, access and dewatering
34	**	Cranberry production
35	*	Maintenance dredging of existing basins
36	2745	Boat ramps where there is no discharge into wetlands
37	2745	Emergency watershed protection and rehabilitation
38	2672	Cleanup of hazardous and toxic waste
40	2673	Farm buildings

Source: U.S. Army Corps of Engineers, Savannah District,
P.O. Box 889
Savannah, GA 31402-0889

APPENDIX C

Current and Pending Regional Permits in Georgia

<u>Geographic Area</u>	<u>Date Issued</u>	<u>Expiration Date</u>	<u>Activity Authorized</u>
1. State of Georgia	1-18-85	1-18-95	Fill for roads and bridges
2. Chatham County	6-29-76	10-8-96	Private, single family docks
3. Camden County	11-5-76	2-1-97	Private, single family docks
4. Glynn County	11-22-76	2-1-97	Mosquito control
5. Chatham County	12-31-83	12-30-95	Private, single family docks
6. Bryan County	2-28-83	8-31-93*	Private, single family docks
7. Liberty County	6-28-84	10-8-96	Private, single family docks
8. McIntosh County	3-31-84	10-8-96	Private, single family docks
9. State of Georgia	9-22-90	9-22-95	Public boat ramps
10. Atlantic Ocean	2-5-90	8-27-00	Placement of materials to improve/expand existing DNR artificial reefs
11. Georgia Coast	10-30-89	10-30-99	Artificial fishing reefs
12. George F. Andrews Lake, Allatoona Lake, West Point Lake, Lake Sidney Lanier, Carters Lake	2-5-88	2-5-93*	Minor work and structures

*Reissuance Pending

**APPENDIX C
(CONTINUED)**

	<u>Date Issued</u>	<u>Expiration Date</u>	<u>Activity Authorized</u>
13. Lake Blackshear	5-8-90	5-8-95	Noncommercial piers, docks, and boathouses; aerial utility lines; limited dredging

Pending Regional Permits

Geographic Area

1. Lake Blue Ridge	Initial dredging, less than 1000 cubic yards
2. Lake Blue Ridge	Maintenance dredging of less than 300 cubic yards
3. Lake Blue Ridge	Noncommercial boathouses/hoists, piers
4. Lake Blue Ridge	Riprap and bulkheads

APPENDIX D

Important addresses and telephone numbers

Section 404 Permits

U.S. Army Corps of Engineers
Savannah District
Regulatory Branch
P.O. Box 889
Savannah, GA 31402-0889
(912) 652-5347
(800) 448-2402

Environmental Protection Agency (E.P.A.)
Region IV
345 Courtland Street, NE
Atlanta, GA 30365
(404) 347-2126

State Water Quality Certification

Water Quality Certification
Environmental Protection Division
Georgia Department of Natural Resources
205 Butler Street SE
Floyd Towers - East, Room 1070
Atlanta, GA 30334
(404) 656-4887

Coastal Marshlands Permits

Georgia Department of Natural Resources
Ecological Services Section
Coastal Resources Division
One Conservation Way
Brunswick, GA 31523-8600
(912) 264-7218

Highly Erodible Land and Wetland Provisions of the 1985 and 1990 Farm Bills

USDA - Soil Conservation Service
Robert G. Stephens Federal Building
P.O. Box 13
355 East Hancock Avenue
Athens, GA 30601-2769
(706) 546-2214

Sensitive Land Certification & NWI Wetland Maps

Georgia Department of Natural Resources
EPD - Geologic Survey - Map Sales
Agriculture Building
19 Martin Luther King Drive, SW
Atlanta, GA 30334
(404) 656-3214

National Historic Preservation Act - Section 106

Georgia Department of Natural Resources
Office of Historic Preservation
205 Butler Street SE
Suite 1462
Atlanta, GA 30334
(404) 656-2840

APPENDIX E

Common Plants Found in Georgia's Wetlands

Common Plants Found in Tidal Wetlands

Saltmarsh cordgrass (*Spartina alterniflora*)
Needlerush (*Juncus roemerianus*)
High tide bush (*Iva frutescens*)
Saltmeadow cordgrass (*Spartina patens*)
Big cordgrass (*Spartina cynosuroides*)
Saltgrass (*Distichlis spicata*)
Coast dropseed (*Sporobolus virginica*)
Bigelow glasswort (*Salicornia bigelovii*)
Woody glasswort (*Salicornia virginica*)
Saltwort (*Batis maritima*)
Sea lavender (*Limonium nashii*)
Sea oxeye (*Borrchia frutescens*)
Silverling (*Baccharis halimifolia*)
False willow (*Baccharis angustifolia*)

Common Plants and Trees Found in Freshwater Wetlands

Trees

Bald cypress (*Taxodium distichum*)
Pond cypress (*Taxodium ascendens*)
Swamp tupelo (*Nyssa aquatica*)
Swamp blackgum (*Nyssa biflora*)
Carolina ash (*Fraxinus caroliniana*)
Planer tree (*Planera aquatica*)
Black willow (*Salix nigra*)
Hazel alder (*Alnus serrulata*)
Pond pine (*Pinus serotina*)

Shrubs

Buttonbush (*Cephalanthus occidentalis*)
Sweetspire (*Itea virginica*)
Fetterbush (*Lyonia lucida*)

Ferns

Royal fern (*Osmunda regalis*)
Netted chain fern (*Woodwardia areolata*)
Virginia chain fern (*Woodwardia virginica*)

Herbaceous Plants

Bulrush (*Scirpus sp.*)
Bur-reed (*Sparganium sp.*)
Lizard's tail (*Saururus cernuus*)
False nettle (*Boehmeria cylindrica*)
Arrowhead (*Sagittaria sp.*)
Pitcher plant (*Sarracenia sp.*)
Switchcane (*Panicum sp.*)
Spikerush (*Eleocharis sp.*)
Rush (*Juncus sp.*)

APPENDIX F

**BEST MANAGEMENT PRACTICES FOR FARM, FORESTRY, LOGGING
AND MINING ROADS IN WETLAND AREAS OF THE UNITED STATES**

1. Permanent roads (for farming or forestry activities), temporary access roads (for mining, forestry, and farming), and skid trails (for logging) [*adjacent to or crossing*] waters of the United States shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific farming, silvicultural or mining operations, and local topographic and climatic conditions;
2. All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions of such roads that must cross waterbodies) to minimize discharges of dredged or fill material into waters of the United States;
3. The road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows;
4. The fill shall be properly stabilized and maintained to prevent erosion during and following construction;
5. Discharges of dredged or fill material into waters of the United States to construct a road fill shall be made in a manner that minimizes the encroachment of trucks, tractors, bulldozers, or other heavy equipment within waters of the United States (including adjacent wetlands) that lie outside the lateral boundaries of the fill itself;
6. In designing, constructing, and maintaining roads, vegetative disturbance in the waters of the United States shall be kept to a minimum;
7. The design, construction, and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life occupying the water body;
8. Borrow material shall not be taken from upland sources unless this is unavoidable;
9. The discharge shall not take, or jeopardize the continued existence, of threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species;
10. Discharges into breeding and nesting areas for migratory waterfowl, spawning areas, and wetlands shall be avoided if practical alternatives exist;
11. The discharge shall not be located in the proximity of a public water supply intake;
12. The discharge shall not occur in areas of concentrated shellfish production;
13. The discharge shall not occur in a component of

Landowners' Guide to Wetlands and Watersheds

the National Wild and Scenic River System;

14. The discharge of material shall consist of suitable material free from toxic pollutants in toxic amounts; and,
15. All temporary fills shall be removed in their entirety and the area restored to its original elevation.

Source: U.S. Army Corps of Engineers
Savannah District
P.O. Box 889
Savannah, GA 31402-0889

REFERENCES

General Sources

Are There Wetlands on My Property? A Guide for the Developer, Annapolis, Maryland: Maryland Department of Natural Resources, 1992.

Brockman, C.F., **Trees of North America**, Racine, Wisconsin: Western Publishing Co., Inc., 1979.

Cowardin, L.M., et al., **Classification of Wetlands and Deepwater Habitats of the United States**, Washington, D.C.: United States Fish and Wildlife Service, 1979.

Cowie, Gail M. and Cooley, James L., **Watershed Protection: A Guidebook for Georgia**, Athens, Georgia: Institute of Community and Area Development, University of Georgia, 1988.

Cowie, Gail M. and Cooley, James L., **Watershed Protection: Building a Local Program**, Athens, Georgia: Institute of Community and Area Development, University of Georgia, 1989.

Developer's Handbook for Freshwater Wetlands, Charleston, South Carolina: U.S. Army Corps of Engineers and South Carolina Coastal Council, 1992.

How to Recognize a Nontidal Wetland, Maryland Department of Natural Resources, Annapolis, Maryland.

Kundell, James E. and Woolf, S. Wesley, **Georgia Wetlands: Trends and Policy Options**, Athens, Georgia: Carl Vinson Institute of Government, The University of Georgia, 1986.

Kusler, J.A., **Our Wetland Heritage: A Protection Guidebook**, Washington, D.C.: Environmental Law Institute, 1983.

Mitsch, W.J. and Gosselink, J.G., **Wetlands**, New York: Van Nostrand Reinhold Co., 1986.

Recognizing Wetlands, U.S. Army Corps of Engineers, 1992.

Robins, C.R., Ray, G.C. and Douglass, J., **A Field Guide to Atlantic Coast Fishes of North America**, Boston: Houghton Mifflin Co., 1986.

Simkins, Hampton, Coder, Kim D. and Lewis, George, **Wetlands Heritage of Georgia**, Athens, Georgia:

Landowners' Guide to Wetlands and Watersheds

Cooperative Extension Service, The University of Georgia College of Agriculture, 1991.

Steinberg, Robert E., **Wetlands and Real Estate Development Handbook**, Rockville, Maryland: Government Institutes, Inc., 1991.

Development Techniques

Best Management Practices for Forested Wetlands in Georgia, Macon, Georgia: Georgia Forestry Association, 1990.

Devereaux, William, *Natural Causes*, **Builder**, July 1991.

Kusler, Dr. Jon A., **Our National Wetland Heritage: A Protection Guidebook**, Environmental Law Institute, 1983.

Salvesen, David, **Wetlands: Mitigating and Regulating Development Impacts**, Washington, D.C.: The Urban Land Institute, 1990.

Government Regulation

Blount, Gregory W., *From Marshes to Mountains, Wetlands Come Under State Regulation*, **Mercer Law Review**, vol. 41, 1990.

How to Expedite the 404 Process of the Clean Water Act (Draft), Savannah, Georgia: U.S. Army Corps of Engineers, Savannah District, January 1992.

Interim Guidance for Wetlands Protection, Raleigh, North Carolina: North Carolina Department of Environment, Health and Natural Resources, 1992.

Kundell, James E. and Woolf, S. Wesley, *Georgia Wetlands: Values, Trends and Legal Status*, **Mercer Law Review**, vol. 41, 1990.

Kundell, James E., et al., **Management of Georgia's Marshlands Under the Coastal Marshlands Protection Act of 1970**, Athens, Georgia: Carl Vinson Institute of Government, University of Georgia, 1988.

Regulatory Program, Applicant Information, United States Army Corps of Engineers, May 1985.