Georgia's Trout Stream Buffer Program Assessment

Under the Georgia Erosion and Sedimentation Act and Georgia Water Quality Control Act

Terry A. DeMeo, Don R. Christy, and James E. Kundell

Carl Vinson Institute of Government
University of Georgia
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Brook Trout (*Salvelinus fontinalis*), Arctic to Georgia, Weight 3 pounds, Length 21"

Brown Trout (*Salmo trutta*)
Introduced widely throughout the U.S.
Weight 35 pounds, Length 3' 4".

Rainbow Trout (*Oncorhynchus mykiss*)
Introduced widely throughout the U.S.
Weight 30 pounds, Length 3' 9".

Images: Duane Raver Art, *Freshwater Fish Collection*, U.S. Fish & Wildlife Service

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Local Elected Officials

Clarence Brown, Bartow County Sole Commissioner
Diane Thomas, Fannin County Clerk
Lou Jean Hill, Gilmer County Clerk
Chan Caudell, Habersham County Commissioner
Steve Gooch, Lumpkin County Sole Commissioner
William Newton, Pickens County Sole Commissioner
Jimmy Bleckley, Rabun County Administrator
Lamar Paris, Union County Sole Commissioner
Don Oliver, Walker County Attorney
Chris Nonnemaker White County Commission Chairman

Local Government Personnel

Ray Sullivan, Bartow County Zoning Administrator
Marie Woody, Fannin County Land Development Department Head
James Hollaway, Gilmer County Planning Director
Steve Patton, Habersham County Building and Planning Development Inspector
Kevin Flanagan, Lumpkin County Environmental Compliance Officer
Norman Pope, Pickens County Planning and Development Director
Roy Lovell, Rabun County Marshall/Soil and Erosion Officer
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EXECUTIVE SUMMARY

Trout streams, and the fisheries they support, enrich the State of Georgia. The economic impact of trout fishing in Georgia has been estimated to exceed $172 million annually. Beyond the economic value of trout fishing, many North Georgia streams provide a priceless personal experience for recreation, beauty and tranquility.

The North Georgia Mountains are the southern most extent of trout streams in the eastern United States. The water conditions and habitat of the higher elevation streams support native brook trout, while rainbow and brown trout have been introduced throughout the region. The streams are spring fed with cold water that moves rapidly over the steep terrain increasing the oxygen content and maintaining cool water temperatures. The tree cover along the trout streams provides deep shade that helps keep the water cold throughout Georgia's hot summer months. The trees and shrubs also provide the primary source of food (small bugs and insect larvae) that sustains the trout fishery, and along with other streamside vegetation, reduce the amount of sediment entering the water.

In Georgia, the state classifies 5,437 miles of streams located in 25 counties as trout streams. Yet, trout streams are relatively fragile environments and trout are particularly sensitive to environmental conditions. Warm water and sediment are the two most serious threats to Georgia's trout fisheries and trout streams. Trout cannot endure water temperatures that exceed 71 degrees Fahrenheit for more than a few days and many of Georgia's trout streams are near the upper temperature tolerance. Discharges of sediment into the water harm reproduction, reduce food supply, and limit living space. It is, therefore, especially important to prevent additional warming and sediment discharges as a result of modifications to the surrounding land and upstream watershed.

Protecting trout stream resources under the Georgia Water Quality Control Act (GWQC Act) and the Georgia Erosion and Sedimentation Act (E & S Act) has been problematic since protection measures were initiated in the mid-1960s. The link between land use and the subsequent effect on water quality and aquatic resources is direct, but implementing protective measures has been difficult because it necessarily involves regulating numerous land-disturbing activities (LDA).

This assessment examined the policy implications resulting from the 2000 amendments to the E & S Act relating primarily to trout streams in five areas: (1) implementation by local issuing authorities, (2) effectiveness of the buffer variance process, (3) occurrence of piping springs and small streams, (4) proper use of the forestry exemption, and (5) incidence of enforcement actions. In conducting this assessment, issues related to the availability and reliability of data and information on erosion and sedimentation control became apparent and ultimately hindered the assessment. In addition, the assessment was hampered by changing requirements as relevant laws were subsequently amended. Consequently, this report includes a brief discussion of the potential implications of relevant subsequent amendments and additional provisions.

The devolution of authority to govern land-disturbing activities under the E & S Act is an example of the state's attempt to respect the traditional authority of local governments to regulate local land use. Chronic shortages of funds and trained personnel at the local level have made it difficult to make improvements in erosion and sedimentation control and water quality. Considering the controversy and difficulties inherent in regulating land use associated with the increasing devolution of responsibility, it is surprising that all local governments surveyed in this study are interested in retaining local issuing authority and remaining responsible for local erosion and sedimentation control programs. Although there is merit in continuing local responsibility for land-disturbing activities (i.e., control of the rate and quality of development, greater responsiveness to the concerns and desires of the community, increased access to the field), the 2003 amendments to the E & S Act and the GWQC Act may increase some local governments' workloads and environmental liability without providing a truly equitable funding mechanism.

From the 25 counties with trout streams, a sample of 14 counties was selected based upon the following four criteria: (1) inclusion in the scientific component of this study; (2) geographic representation; (3) mileage of trout streams on private lands; and (4) population growth rate (average of 38 percent growth between 1990 and 2000). Of the 690 land-disturbing activity permitting programs statewide, 60 are included in this study. Of those programs, 31 are implemented by the Georgia Environmental Protection Division (EPD), 10 by counties, and 19 by cities. Data were obtained through survey methods. During the five-year evaluation period (1999-2003), survey responses estimated that 4,209 LDA permits were issued with 1,864 permits (44 percent) affecting trout streams. The number of LDA permits affecting trout streams was not reported for five counties. Notwithstanding the growth rate of some counties, the trend in LDA permits remained relatively flat over the evaluation period.

In the 2000 amendments to the E & S Act, trout stream buffers were reduced in width from 100 feet to 50 feet. A 50-foot wide buffer is within the scientifically recommended range for some buffer functions under some site conditions. In this case, the reduction in protection benefits resulting from narrower buffers may be offset by formalizing the buffer variance process, in particular with the adoption of buffer variance decision criteria that make it more difficult to obtain a variance. Yet, data collected as part of this study indicate the buffer variance process has been rather stable over the five-year evaluation period, with no significant increases in the number of requests or the number of denials. Based on that finding, it is difficult to attribute any increased protection benefits to the new buffer variance process. It should be noted, however, that the overall process appears to have benefited from the transparency and objectivity provided by the criteria and by more rigorous application procedures.

The piping of springs and small streams that are classified trout streams could have significant impact on water quality and trout and other aquatic species, if the practice is widely used. Although state law and regulations require landowners to report the piping of springs and small streams that are classified as trout streams to the issuing authority and provide that the local issuing authorities report the incidence of piping annually to EPD, neither requirement is currently satisfied. The practice of piping is governed by a general variance, which is generally a self-administered provision and, by its nature, minimizes involvement of any regulatory entity. The variance provisions are dependent on the landowner/developer acting in good faith, even

though there may be an inherent conflict of interest to do so. Most issuing authorities surveyed in this study believe that piping is a common practice, but have no direct information on its occurrence. The inability to determine the incidence of piping and to evaluate its impact on trout stream resources is problematic. Given the paucity of data, an evaluation of this provision of the 2000 amendments cannot be reliably completed. As a result of this study's findings, the piping provisions of the E & S Act may merit restructuring to allow for more effective administration by EPD or a local issuing authority, perhaps under an individual permit.

A dearth of reliable data on the proper use of the forestry exemption also exists. There is reason to believe that land-disturbing activities are occurring under the forestry exemption, and if the exemption is adhered to as designed in the 2000 amendments, protection of water quality and trout resources can be expected. The forestry exemption, however, has no notification or reporting requirements making it impossible to determine its occurrence or effectiveness. In the absence of any notification or reporting requirement, data are not collected and an evaluation of this provision of the 2000 amendments to the E & S Act cannot be undertaken; therefore, it remains impossible to determine if the exploitation of the forestry exemption is continuing as a means of evading erosion and sedimentation requirements and thus contributing to the degradation of the state's water quality. Proper implementation of the forestry exemption may benefit from the inclusion of reasonable and appropriate notification and/or reporting requirements to an identified entity.

More stringent enforcement, as indicated by the inspection frequencies, number of inspectors employed and incidence of enforcement actions, is another way to assess the impact of the 2000 amendments. Due to lack of data, many issuing authorities reported estimates of the number of erosion and sedimentation control inspectors and inspection frequencies, making it difficult to compare local enforcement rates or evaluate their effectiveness. The complex division of enforcement roles and responsibilities among participating entities appears to complicate record-keeping and hinder effective enforcement. For example, the Department of Audits and Accounts found that the Georgia Soil and Water Conservation Commission's "regional offices are only required to document the number of complaints received, the source of the complaints, and the subject of the complaints. They are not required to maintain information for verifying that all of the complaints were actually resolved or were resolved in a timely manner." Clearly, laws and programs are only as good as the degree to which they are meaningfully enforced

Since 1994, the maximum civil penalty under the E & S Act has been $2,500 per day. The 2000 amendments established a minimum fine of $1,000 per day ($250 for single-family residences). The minimum fine was repealed in 2003. Since the cost of compliance can be significant and the probability of a violation being detected is rather low, the civil penalties provided under the E & S Act may not serve as a sufficient deterrent.

Monitoring and inspection is essential to every enforcement program. The 2001 performance audit found deficiencies in EPD's inspection program. Surveyed counties reported a wide range of inspection frequencies with some only inspecting based upon citizen complaints to one county conducting more than 5,000 inspections annually. Because data are incomplete and not reported in any standardized format, no reliable assessment of the inspection program can be made.

The number of erosion and sedimentation control inspectors by county also varied widely. In those counties where EPD administers the program, eight inspectors handle activities in 28 counties. Otherwise, the number of inspectors ranged from none in one county to three in several counties over the five-year evaluation period. In general, all counties reported having access to at least one inspector, which is widely accepted as an under-staffed ratio of personnel to function. Citizen complaints, therefore, become an important means to gain awareness of erosion and sedimentation control failures.

Enforcement actions can take several forms. These include a notice to comply, a letter of intent (to initiate a formal enforcement action), a consent order, and an administrative order. In addition, stop work orders probably provide the strongest practical incentive available to achieve compliance due to costs associated with work stoppage. Reported data on the number and type of enforcement actions in surveyed counties varied widely in type and content. It appears that most counties have undertaken enforcement efforts, but a comprehensive evaluation of enforcement programs is not possible based upon these data. Although the 2000 amendments facilitated the issuance of stop work orders to violators, there is no indication that the use or effectiveness of stop work orders had increased since 2000 based on the survey data. The EPD has used its enforcement authority to execute 69 consent orders (39 under the E & S Act and 30 under the GWQC Act) over the five-year period. The agency has also collected approximately $275,000 in fines and penalties. Consent order data indicate an increased enforcement effort over the five-year evaluation period.

The permit fee system, instituted in the 2003 amendments linking the E & S Act with the NPDES general stormwater permit, was conceived as a means of addressing those budget shortages at the state and local levels that have produced chronically under-staffed state and local erosion and sedimentation control programs. The permit fee was negotiated in return for relief from the previously required monitoring under the E & S Act with the idea of using the proceeds to hire enforcement personnel.

The EPD's portion of the fee (one-half of the $80.00 per acre of disturbed land in jurisdictions with a local issuing authority and the full amount in all other jurisdictions) is placed in the state general fund. Appropriation of those monies for program purposes remains subject to budget constraints and legislative spending priorities in any specific year. Based upon research for this study, EPD apparently has not clearly articulated any services that it plans to provide in certified local issuing authorities that merits provision of a portion of the fee. Since the use of fee proceeds cannot be tied to services, a perception is created that the fee is actually a tax. Perhaps in locations with a certified local issuing authority the fee amount should be paid in full to the implementing local government. Paying the full amount to local governments for local enforcement may be the best means of ensuring more effective on-the-ground administration of the law. If, however, EPD provides oversight for local issuing authorities that require funding, this should be articulated to justify the state's portion of the fee.

Although an assessment of data and information issues was not originally part of the scope of this study, the lack of reliable information was so common and widespread as to affect the completion of the study's objectives and, therefore, merits discussion. The availability of

reliable data and information are necessary to conduct an accurate policy analysis or program evaluation. As part of the 2001 performance audit, the Department of Audits and Accounts concluded that the data necessary to determine if the State Erosion and Sedimentation Control Program is "achieving its overall purpose of protecting the state's land and water resources" is not maintained. In addition, the baseline water quality data necessary "to measure the Program's impact on the amount of sediment in the rivers and streams" is not available and "as a result, there is no way to determine if the state's waters are improving as a result of the Erosion and Sedimentation Control Program." To rectify this situation, the Department of Audits recommended that specific goals and objectives for evaluating the effectiveness of the Program be established. This study has found no evidence of action on that recommendation.

Likewise, there is a dearth of data and information on local erosion and sedimentation control programs. Nearly every issuing authority in this study reported difficulty in gathering the data requested in the survey. Some issuing authorities indicated that they did not precisely track information on the total number of LDA permits issued, permits issued for development on trout streams, the number of inspectors, the rate of inspection frequency, and incidence of inspections and enforcement actions. Virtually all issuing authorities had no data on stream piping and the number of claimed forestry exemptions. Several issuing authorities reported that they did not even have a data collection protocol in place. Frequently, it was impossible to replicate complete data sets for the five-year evaluation period. Even where data are available, there is no consistent format.

In addition to issues with gathering and reporting the complete data sets necessary to analyze trends, all issuing authorities (local and state) reported a lack of confidence in the reliability of the data that were available. Several issuing authorities reported that information submitted by previous personnel is suspect in its accuracy. In general, these issues seem to be related to the absence of those data collection protocols or criteria that would create consistency in data collection and reporting even when multiple personnel are involved.

Trout stream buffer protection is a complicated undertaking because protection provisions are based in two state laws (i.e., E & S Act and GWQC Act); because local governments have responsibility in some areas, while the state retains responsibility in other jurisdictions; because the roles and responsibilities are diverse among multiple local, regional, and state entities; and because there has been no effort to document, gather and report the kind of data necessary to assess progress. The cooperative development of data collection and reporting protocols and the dissemination of those protocols in the form of guidance for issuing authorities and for all other entities with a role in erosion and sedimentation control could alleviate many issues with standardized record keeping, routine data reporting and consistent program administration. Effective protocols could provide for a stronger erosion and sedimentation control program statewide, increased protection of trout streams, and greater water quality benefits.

Most local governments encourage development and growth because it strengthens the local economy and builds the tax base providing revenues for the provision of community services. Yet, there may be an unrealistic expectation for local governments to both seek and regulate development. Some may find it difficult to deny permits and/or effectively enforce

provisions that may slow construction or drive developers to a nearby local issuing authority with less rigorous enforcement practices. Strong state support of education and outreach efforts at the local level may be the most significant action that can be taken to inform those involved in LDAs of the laws, rules, procedures and consequences. Steps to effectuate the need for education and training for those involved in all aspects of LDA permits has begun with the development of a revised curriculum and training program, as required by the 2003 amendments to the E & S Act. State law requires certification under the new training curriculum by 2006. Assessment of the impact of this new effort, therefore, must be made at a later date. To complement this education effort the state should support local governments in conducting community outreach on water quality issues and erosion and sedimentation control practices.

Vegetated buffers play an important role in protecting water quality in streams statewide and in trout streams, specifically. Sediment fills in streams and reservoirs; clogs water intakes; and carries heavy metals, nutrients and other chemicals that increase the complexity and cost of water treatment for public drinking water systems. Most public water supplies in North Georgia depend on surface water sources, erosion and sedimentation can impose significant water treatment costs. The protection of buffers on trout streams and warm water streams is, therefore, a challenge statewide and not only an issue that just affects streamside property owners, local governments, or state agencies.

INTRODUCTION

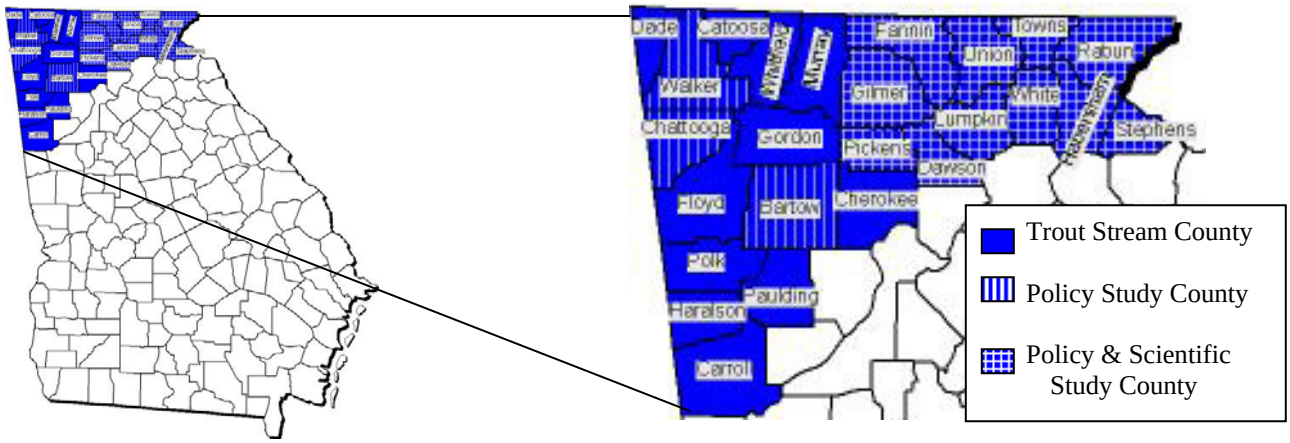
Trout streams, and the fisheries they support, are one of the many natural resources that enrich the State of Georgia. The economic impact of trout fishing in Georgia has been estimated to exceed $172 million annually in purchases of sporting goods, bait, guide services and food and in expenditures at hotels and motels, fishing lodges and camps, and restaurants. The American Sportfishing Association determined that trout fishing also generates more than $3.4 million in state sales tax, $2 million in state income tax, and $4.8 million in federal income tax annually.[1] In addition, over 100,000 trout fishing licenses were sold last year, generating over one-half million dollars in state revenue.[2] Beyond the economic value of trout fishing to many North Georgia communities is a priceless personal experience. Georgia's trout streams provide important economic value and recreation, beauty and tranquility for all citizens to enjoy.

Georgia's Trout Streams

The North Georgia Mountains are the southern most extent of trout streams in the eastern United States.[3] The water conditions and habitat of the higher elevation streams support native brook trout and rainbow and brown trout have been introduced throughout the region. The streams are spring fed with cold water that moves rapidly over the steep terrain increasing the oxygen content and maintaining the cool water temperatures. The tree cover along the trout streams provides deep shade that helps keep the water cold throughout Georgia's hot summer months. The trees and shrubs also provide the primary source of food (small bugs and insect larvae) that sustains the trout fishery.

In Georgia, 5,437 miles of streams located in 25 counties are classified by the state as trout streams (Figure 1). Yet, trout streams are relatively fragile environments and trout are particularly sensitive to environmental conditions requiring cold, clean water to survive and reproduce.[4] Warm water and sediment are the two most serious threats to Georgia's trout fisheries and trout streams. Trout cannot endure water temperatures that exceed 71 degrees Fahrenheit for more than a few days and many of Georgia's trout streams are near the upper temperature tolerance.[5] It is, therefore, especially important to prevent additional warming as a result of modifications to the surrounding land and upstream watershed. The most effective ways to protect stream temperatures are to maintain vegetated streamside buffers and to avoid impounding streams with dams or withdrawing excessive amounts of surface water.[6]

Figure1. Georgia's trout stream counties



Trout streams must be kept free of sediment because silt harms trout reproduction, food supplies and living space. Trout eggs and larval fish incubate in the gravel on the streambed and are easily smothered by sediment that clogs the spaces between the gravel stones preventing the circulation of oxygen-laden water. Aquatic insects, the major food source of trout, are likewise detrimentally affected by streambed siltation. Sediment also fills in the deep stream pools, the main living space of adult trout, reducing the number of trout the stream can support.[7] Like buffering for temperature control, retaining vegetated streamside buffers is the most effective way to prevent sediment from entering trout streams.[8] This increased sensitivity to temperature and sediment pollution is the reason trout streams are provided special water quality classification under the Georgia Water Quality Control Act (GWQCA) and trout stream buffers are protected under the Georgia Erosion and Sedimentation Act (E & S Act).[9] In addition, trout serve as an indicator species of the health of the aquatic system. If trout are present, the aquatic system is functioning properly.

Legislative Advisory Committee on Trout Stream Buffers

Implementation of the trout stream buffer protection has been problematic in the past and in 1997, the Georgia Department of Natural Resources (DNR) released proposed changes to their rules and regulations to address a number of concerns including the frequency with which variances were granted for activities within the required stream buffers. The draft regulations created controversy and were countered by proposed legislation that would effectively dismantle the buffer provisions of the Erosion and Sedimentation (E & S) Act, especially for trout streams. The draft regulations were withdrawn by DNR and the proposed legislation died in the Senate Natural Resources Committee. However, to address some of the underlying concerns, a Legislative Advisory Committee on Trout Stream Buffers was created by joint agreement of the Chairmen of the Senate Natural Resources Committee, House Natural Resource and Environment Committee, and House Game, Fish and Parks Committee and the Commissioner of the DNR. The three Chairmen appointed ten members, five representing North Georgia stakeholder concerns and five representing environmental concerns. The Advisory Committee was asked to provide recommendations on how to better structure the buffer program and to determine whether legislative or regulatory changes should be made in Georgia's Erosion and Sedimentation Control Program relating to stream buffers.

After the advisory committee identified the issues, Governor Barnes selected one person representing the mountain stakeholder concerns and one person representing environmental concerns and two other individuals to attempt to work out an agreement. A set of recommendations were agreed to and legislation was developed to implement these recommendations. These amendments to the E & S Act passed in 2000[10] and represent significant changes to the law and the administration of the state's erosion and sedimentation control program. Easing prohibitions to land-disturbing activities, clarifying variance criteria and procedures, and increasing enforcement could have profound effect on trout stream resources and implementation of erosion and sedimentation control programs at the local level. To evaluate the effects of the 2000 amendments to the E & S Act on Georgia's trout streams, the General Assembly authorized a three-year trout stream buffer study.

TROUT STREAM BUFFER STUDY

The Trout Stream Buffer Study, from the start, was divided into two parts. One study, completed by the River Basin Center at the Institute of Ecology, the University of Georgia, focuses on the scientific implications of the changes made in 2000. Objectives of the scientific study include examining the effect of buffer width and piping of streams on the aquatic health, water quality, and habitat of trout streams. The results of the Institute of Ecology study are presented separately in the report *Implications of Changes in Riparian Buffer Protection for Georgia's Trout Streams* and will not be addressed here. This report, *Georgia's Trout Stream Buffer Program Evaluation Under the Erosion & Sedimentation Act and the Georgia Water Quality Control Act*, was produced by the Carl Vinson Institute of Government, the University of Georgia based on an assessment of the policy implications of the 2000 amendments.

Study Scope

The scope of the Carl Vinson Institute of Government's assessemnt of trout stream buffer program administration includes the following components of the E & S Act: local issuing authority, the buffer variance procedure, spring and small stream piping of classified trout streams, silviculture or forestry exemptions, and enforcement. Specifically, this study assesses the effectiveness of the variance process, the occurrence of spring and small stream piping of classified trout streams, the use of silviculture exemptions and the incidence of enforcement actions. It focuses on the implementation of these components over the 1999 – 2003 five-year time period, although other provisions of the E & S Act are referenced. It is worth noting that the E & S Act was amended in 2003 and 2004 resulting in major revisions to the Act and to administration of the program. In particular, the National Pollution Discharge Elimination System (NPDES) general stormwater permit under the federal Clean Water Act (CWA) became linked with the E & S Act in the 2003 amendments. Although this study focuses on the administration of the trout stream buffer portion of the E & S Act, implications of the 2003 and 2004 amendments are included where appropriate. This study did not include evaluation of monitoring requirements, the certification and decertification process, or other components of the E & S Act not mentioned above.

Study Location

Nearly all of Georgia's trout streams are located within 25 counties in the northern portion of the state (Figure 1). Due to cold-water discharges from deep-water intakes in Lake Lanier and Lake Hartwell, the tailwaters of both reservoirs also support introduced trout fisheries. Forty-four miles of the Chattahoochee River below Lake Lanier and 1.5 miles of the Savannah River below Lake Hartwell are designated trout streams, but are not included in The Environmental Protection Division's (EPD) count of total trout stream miles for the state, perhaps because the river conditions are subject to change based on hydro-electric generation releases from the reservoirs. As a result, the 45.5 miles of trout stream segments of the Chattahoochee and Savannah rivers are not included in this study, nor are the counties adjacent to these sections (Forsyth, Fulton, Gwinnett, Cobb, and Hart). Counties were selected as the unit of analysis for this study because the vast majority of trout streams lie outside of municipal boundaries. Therefore, responsibility for implementation of the trout stream buffer portions of

the E & S Act fall mostly to the counties, although many cities in North Georgia also regulate land-disturbing activities under the Act.

Fourteen North Georgia counties (Figure 1) were selected as a sample for inclusion in this study of trout stream program administration based on four criteria. First, all of the 11 counties included as field sites for the scientific study examining aquatic health, water quality, and trout stream habitat were selected because it may be possible to infer implications from the overlap of the scientific and policy assessments that would otherwise not be discernable. Since these 11 counties cluster in the northeast section of the state, three additional counties were selected to meet the second criterion; a geographically representative subset of North Georgia counties. Selecting counties that have a large number of trout stream miles on private land within their jurisdictional boundaries was the third criterion in choosing this study's sample (Table 1). Most of the designated trout streams in Georgia are located on private property. Permitting land-disturbing activities on private land, therefore, is the basis of implementation of the E & S Act and, consequently an important consideration for the evaluation of local program administration.

Counties that have experienced rapid rates of growth over the past 20 years provided the fourth criterion by which sample counties were selected. Ten of the 14 counties in this study had growth rates greater than the state average of 26.4 percent from 1990 to 2000. Rapid rates of growth in population can be related to high rates of development and may be indicative of areas that will continue to see increases in population, growth and development in the near term. Growth and development pressures are directly related to pressures on natural systems especially in areas with restrictive development potential and sensitive landscapes like the mountain region with relatively narrow valleys, steep slopes and trout streams. The administration of programs to protect natural resources (i.e., trout streams), therefore, are under increased pressures in areas experiencing rapid growth and development.

Table 1. Trout stream miles by county, population and growth rates (study counties in red).

County	Trout Streams (miles)			Population			Growth (percentages)	
	Public Land	Private Land	Total	1980	1990	2000	1980 - 1990	1990 - 2000
Bartow		257	257	40,760	55,915	76,019	37.2	36.0
Carroll		10	10	56,346	71,422	87,268	26.8	22.2
Catoosa		77	77	36,991	42,464	53,282	14.8	25.5
Chattooga	38	206	244	21,856	22,242	25,470	1.8	14.5
Cherokee		71	71	51,699	90,204	141,903	74.5	57.3
Dade		65	65	12,318	13,147	15,154	6.7	15.3
Dawson	47	118	165	4,774	9,429	15,999	97.5	69.7
Fannin	205	352	557	14,748	15,992	19,798	8.4	23.8
Floyd	11	156	167	79,800	81,251	90,565	1.8	11.5
Gilmer	87	511	598	11,110	13,368	23,456	20.3	75.5
Gordon	4	102	106	30,070	35,067	44,104	16.6	25.8
Habersham	75	108	183	25,020	27,622	35,902	10.4	30.0
Haralson		114	114	18,422	21,966	25,690	19.2	17.0
Lumpkin	136	212	348	10,762	14,573	21,016	35.4	44.2
Murray	146	62	208	19,685	26,147	36,506	32.8	39.6
Paulding		105	105	26,110	41,611	81,678	59.4	96.3
Pickens		261	261	11,652	14,432	22,983	23.9	59.3
Polk	2	94	96	32,382	33,815	38,127	4.4	12.8
Rabun	289	190	479	10,466	11,648	15,050	11.3	29.2
Stephens	30	23	53	21,761	23,436	25,435	7.7	8.5
Towns	107	112	219	5,638	6,754	9,319	19.8	38.0
Union	192	242	434	9,390	11,993	17,289	27.7	44.2
Walker	55	284	339	56,470	58,340	61,053	3.3	4.7
White	99	107	206	10,120	13,006	19,944	28.5	53.3
Whitfield	10	65	75	65,775	72,462	83,525	10.2	15.3
Total	1,533	3,904	5,437					

Data Sources: Trout stream data are based on digitized USGS 1:125,000 scale topographic map data from Wildlife Resources Division, Department of Natural Resources, December 1998. Not included: Lake Lanier Tailwaters, 44 miles of Chattahoochee River and Lake Hartwell Tailwaters, 1.5 miles of Savannah River. Population and Growth Data extracted from Georgia Department of Community Affairs County Snapshots.

Sources of Information and Data

Information for this study was gathered from a variety of sources including a review of documents, surveys and personal communications. The review of documents resulted in the chronological summary of trout stream buffer and Erosion and Sedimentation Control Program related legislation, rules, regulations and studies (Appendix A). The chronology summarizes a legislative review of the original E & S Act and amendments made to it (with the exception of purely technical amendments) including several bills that were proposed but not passed by the General Assembly or signed into law by the Governor. Appendix A also summarizes a review of E & S related Opinions of the Attorney General; Rules of the Georgia EPD (Chapter 391-3-7 and Chapter 391-3-6) and Wildlife Resources Division (WRD) (Chapter 391-4-3); and published results of formal and informal study committees including Dirt 1, Dirt 2, Legislative Advisory

Committee on Trout Stream Buffers, and a Performance Audit of the Erosion and Sedimentation Control Program conducted by the Georgia Department of Audits.

Other materials comprising the documents review portion of this study are meeting minutes, intra- and interoffice memoranda, meeting materials prepared by EPD and WRD staff, maps, databases, and websites. The E & S Act and the state's erosion and sedimentation control program, administered by EPD, were a significant topic of discussion at 10 meetings of the DNR Board and its committees between September 2000 and February 2003. These discussions occurred at four meetings of the DNR Board, three meetings of the Environmental Protection Committee, one meeting of a Temporary Erosion/Sedimentation Subcommittee, one meeting of the Committee of the Whole and one meeting of the Legislative Committee. Statewide buffer variance data, including requests and dispositions (grants/denials), were gathered from logs maintained by the EPD Erosion and Sedimentation Control Program. Data on local issuing authorities and enforcement actions in the trout stream counties were excerpted from two databases published on EPD's website. A complete list of documents reviewed for this study can be found in Appendix B (not all of these documents are summarized in Appendix A).

In addition to information gathered through a review of documents, staff of the issuing authorities completed surveys for each of the counties in the study sample. The survey questions focused on local implementation of the erosion and sedimentation program and concerns, if any, regarding the state's policies, rules and laws on trout stream buffers (the survey can be found in Appendix C). The results of these surveys provided much of the data on program implementation at the local level and invaluable insights on local perspectives. Personal communications with local elected officials; county staff; personnel with the Georgia EPD, Georgia WRD, and Georgia Forestry Commission; and members of the DNR Board provided another source of information on local and state program implementation and are referenced in this report when relevant.

TROUT STREAM RELATED LEGISLATION

Federal and State laws have protected the special water quality and temperature requirements of Georgia's trout habitat since the mid-1960s. The Federal Water Quality Act of 1965 and the corresponding Georgia Water Quality Control Act of 1964 provided the initial legislative frame for protecting trout stream water quality. Later, the Georgia Erosion and Sedimentation Act of 1975 provided an administrative program to protect trout stream buffers.

Water Quality Standards

In 1965, the Federal Water Quality Act (which later became the Federal Water Pollution Control Act in 1972 and the Clean Water Act of 1977) required states to adopt water quality standards.[11] Developing standards involves classifying state waters according to use and setting criteria to provide protection for the classified use.[12] In their classification schemes, states are required to include the minimum uses listed in federal law (i.e., public water supplies, propagation of fish and wildlife, agriculture and industrial purposes, recreation and navigation), but are provided the flexibility to also designate uses for subcategories in instances where there may be distinct habitat characteristics (i.e., trout streams).[13]

In responding to a portion of the 1965 requirement, the Georgia Water Quality Control Board adopted regulations in 1967 establishing water quality standards for designated trout waters.[14] The water quality standards for designated trout waters were the same as those for the highest applicable water use classification, with the exception of temperature and dissolved oxygen criteria for which designated trout streams were more stringent. In streams designated as trout waters, no elevation or depression of natural stream temperature was allowed and a daily average of 6.0 mg/l of dissolved oxygen was required at all times with no less than 5.0 mg/l at any point in time.[15]

The no change in temperature criteria was based on the knowledge that most of the state's trout streams were at or near the upper tolerance limit during the summer months.[16] Yet almost immediately after the water quality standards were adopted, the validity of the no change in temperature criterion was questioned because it blocked construction of flood control impoundments in designated trout stream watersheds. Numerous field investigations completed by state wildlife and fisheries biologists, however, verified temperature requirements and supported the trout stream temperature criteria.[17]

Along with the list of classified uses, the criteria identified for providing protection was submitted to and approved by the Federal Water Pollution Control Administration, a forerunner of the United States Environmental Protection Agency (EPA) as Georgia's water quality standards.[18] Since the adoption of the state's water quality standards, the authority to designate trout streams as a subcategory has shifted and the list of designated trout streams has changed.

Authority to Designate Trout Streams

The State Game and Fish Commission (Commission) was provided the authority to designate trout streams in 1955.[19] The Commission's responsibilities were transferred to the

newly created Department of Natural Resources under the Executive Reorganization Act of 1972. The Commission became the Game and Fish Division within DNR (later the Wildlife Resources Division).[20] In 1996, the Wildlife Resources Division (WRD) was provided with the authority to designate trout streams for water quality purposes with the stipulation that the list of designated trout streams could not be amended except after scientific study, coordination with the Georgia Environmental Protection Division (EPD) and approval by the DNR Board and EPA.[21] The authority to designate a stream, lake or watershed as trout waters was delegated to the DNR Board in 1998, where it remains, along with the authority to promulgate rules and regulations listing trout streams.[22]

Georgia Water Quality Control Act

The Georgia Water Quality Control Act, passed in 1957, provides Georgia with the legal authority to obtain primacy (federal program delegation) to administer the Clean Water Act (CWA), previously the Federal Water Quality Act.[23] The Commission originally designated trout streams for state regulatory (i.e., fishing licenses, seasons, limits, bait, etc.) and fisheries management purposes (i.e., breeding, rearing and introduction of hatchery-reared trout fingerlings, etc.). In 1971, however, the rules and regulations of the Commission were amended to recognize that trout streams must be classified for water quality purposes under the Federal Water Quality Act, as distinct from the classification of trout waters for state regulatory purposes.[24] Georgia's designated trout waters were officially listed for the first time under the water quality protection provisions of the GWQC Act in 1971.[25] A different list of designated trout streams for fisheries purposes remains.

Designated Trout Streams

The lists of designated trout streams have been revised from time to time when stream sections are added or removed or when the status of designated trout waters is changed under two dual classification systems (i.e., seasonal/year-round and primary/secondary). In 1975, identical Senate and the House Resolutions requested DNR to study trout stream designations resulting in the primary and secondary classification system for designated trout streams.[26] Primary trout waters are streams supporting a self-sustaining population of rainbow, brown, or brook trout. Secondary trout waters are those with no evidence of natural trout reproduction, but which are capable of supporting trout throughout the year (i.e., water temperatures will support introduced trout, whether or not the fish reproduce).[27]

The primary/secondary classification system is related to water quality-based trout stream designations and temperature standards. Currently, no elevation of natural stream temperatures in designated primary trout streams is permitted and no elevation exceeding two degrees Fahrenheit of natural stream temperatures in designated secondary trout waters is permitted.[28] In 1977, the Game and Fish Code was enacted completely revising the state laws relating to game and fish including the designation of trout streams with and without seasons[29] (later to be described as seasonal/year-round), which is related to fisheries management regulations.[30] The distinction made by this designation is whether trout fishing is allowed year-round or only during a designated trout season. Year-round fishing is generally allowed where there are only introduced trout while the seasonal designation is applied to streams with reproducing trout populations.

One of the first changes to the list of designated trout streams was in 1978 when the Game and Fish Code was amended to exclude impoundments of trout waters as designated trout streams.[31] The code was amended the next year (1979) to expand the list of designated trout waters with and without seasons.[32] Then in 1982, stream segments were upgraded from secondary to primary designation based on fish population sampling, while others were added and deleted to the secondary trout waters list based on water temperature and flow data.[33] Several trout streams were removed from the list in 1998 based on field studies of temperature data indicating temperatures too warm to support trout year-round. Additional streams were added as secondary trout waters based on temperature monitoring in 1992, while some were upgraded from secondary to primary and others downgraded from primary to secondary based on fish population sampling.[34]

The list of seasonal and year-round trout streams was removed from the Georgia Game and Fish Code (O.C.G.A. 27-1-1 et seq.) in 1998 and subsequently adopted as rules and regulations by the DNR Board.[35] Currently, trout waters subject to fishing regulations are listed in the rules and regulations of WRD.[36] A similar, but not identical, list of designated trout waters is listed in EPD's rules and regulations for water quality related to water quality standards.[37] Only EPA can affect revisions to the list of designated trout streams related to water quality standards by approving changes suggested by the DNR Board.[38]

EPD and WRD jointly develop the lists of proposed trout waters based on several factors. Typically a stream segment will be suggested as a potential trout stream based on knowledge of the resource, historical data of the presence and extent of trout, records of successful stockings, and available fish population and temperature data.[39] EPD and WRD present their recommendations of proposed trout waters to the DNR Board for approval. The DNR Board attempts to maintain consistency between trout waters listed for fisheries purposes and those listed for water quality and erosion control purposes. However, the two lists are independent and a change in one does not automatically affect the other,[40] because the list associated with water quality standards must be submitted to EPA for approval as part of the state's federal program delegation. Changes to the list of waters based on water quality provisions (i.e., water use classifications and water quality standards) are difficult to make once they have been approved at the federal level.

EPA is usually reluctant to approve a lowering of water use standards or classifications because it provides a disincentive to maintain and/or improve water quality. If waters are degraded below the approved water use classification, the CWA specifies that pollutants must be reduced to meet the previous water use classification standard rather than lowering the classification to fit the polluted water. In addition, declassifying trout streams based on a fishery standpoint may actually contribute to downstream water quality degradation, if land disturbing activities and land practices in the upstream watershed result in inputs of warm and/or polluted water.

Georgia Erosion & Sedimentation Act

The Federal Water Quality Act/CWA and the GWQC Act set into law requirements for water quality standards to protect the temperature (and other requirements) of trout waters in Georgia. The Erosion and Sedimentation Act of 1975 also addresses water quality by prohibiting the erosion of soil into State waters. The E & S Act regulates land-disturbing activities on private and public land (with exceptions). Due in part to the controversial nature of regulating land use and the difficulty of keeping soil out of water, the E & S Act has been amended 12 times since its adoption in 1975, not including purely technical amendments. In addition, three Attorney General Opinions have been issued to clarify provisions of the E & S Act over its 29-year history and at least 10 formal studies have been undertaken, including a Performance Audit of the Erosion and Sediment Control Program completed by the Georgia Department of Audits and Accounts. A full chronology of trout stream buffer related legislation, rules, regulations and studies and the chronology of studies of and changes to the E & S Act can be found in Appendix A.

Buffer requirements were added to the E & S Act in the 1989 amendments as a way to address the movement of soil into State waters and to provide a measure for the maintenance of the trout stream temperature standards. An undisturbed 25-foot natural vegetative buffer was required for all state waters (with a few exceptions) as measured from the stream bank. In addition, all land-disturbing activities were prohibited within 100 feet of the banks of designated trout streams, except for roadway drainage structures. The 1989 amendments also authorized the Director of the EPD to grant a variance to the 100-foot trout stream buffer requirement, but did not provide for guidance on a variance process or criteria.[41]

Changes made to the E & S Act in 2000 attempted to balance the easing of prohibitions to land-disturbing activities with increased enforcement capabilities. Changes that eased the trout stream buffer requirements included:

- reducing the trout stream buffer width from 100 to 50 feet;
- providing for a 25-foot buffer on springs and trout streams discharging an average annual flow of 25 gallons per minute (gpm) or less; and
- allowing landowners to pipe springs and trout streams discharging an average annual flow of 25 gpm or less under a general variance.[42]

The trout stream buffer variance process was clarified in the 2000 amendments as well. Although many believed that the issuance of variances had become so frequent as to violate the intent of the E & S Act, the conflicting belief that trout stream buffer variance requests were routinely, and perhaps arbitrarily, denied was also widely held (see Figure 6). The amendments, therefore, required the DNR Board to adopt rules by December 31, 2000:

- specifying the criteria that the EPD Director must use in granting or denying variances; and

- providing for a general variance for piping springs and streams discharging an average annual flow of 25 gpm or less.[43]

The 2000 amendments to the E & S Act also attempted to facilitate improved enforcement of buffer and other requirements. This was established by clarifying the process for issuing a stop work order for violations that remained uncorrected and by establishing a minimum civil penalty. In addition, landowners were required to notify the local issuing authority of the location and extent of the piping of small springs and trout streams. Landowners also were required to include in their notification their choice of approved methods for measuring the annual average discharge volume of the spring or stream. The final major change to enforcement focused on closing a loop in the existing forestry exemption. The change prevents landowners from bypassing the buffer requirements by clear-cutting the property (including the buffer) under a forestry exemption, then developing the property. Since the 2000 amendments, the forestry exemption precludes any other land-disturbing activity on the entire property for three years when silviculture practices are conducted in the buffer.[44]

Linking Water Quality and Land Disturbing Activities

Designating all streams within identified trout stream watersheds as trout waters recognized the link between upstream actions and downstream water quality.[45] The only effective way to ensure that trout streams are protected is also to protect the small tributaries that drain into them.[46]

> The thermal characteristics of any stream are such that a gradual temperature increase occurs as flow proceeds downstream. Thus, the length of a designated trout stream could be shortened by the warming of any tributaries or upper lengths of the main stream. For this reason the same water quality standards apply to smaller tributaries that contain no native trout and are too small to withstand fishing pressure if trout species were introduced.[47]

To classify by watershed, all streams appearing on a United States Geologic Survey (USGS) 1:125,000-scale topographic map *upstream* of a designated trout stream segment *also* are considered trout streams. In 1996, the University of Georgia Center for Remote Sensing developed a map of trout streams based on a USGS data including all streams on 1:125,000 scale topographic maps. Based on this computer-mapped database, the current total trout stream mileage in the state is 5,437.[48] Approximately 4,000 miles of the total 5,437 miles of designated trout stream are actually fishable by the over 100,000 trout anglers in the state.[49]

It is important to keep in mind that many streams are not shown on county maps. The 1:125,000 scale on which the trout stream mileage is calculated is extremely conservative, tending to overlook small streams, so the actual trout stream mileage in Georgia is much greater than 5,437 miles. As an example, a recent examination of Rabun County streams at a 1:25,000 scale revealed 300 additional miles of trout streams than is accounted for in Table 1 (479 total miles in Rabun County).[50] Another important consideration is that the majority of the designated trout streams (3,904 miles) are located on private property for which the landowner controls access and fishing rights[51] yet for which the local government has authority to regulate land-disturbing activities.

LAND-DISTURBING ACTIVITIES

The adoption of the E & S Act in 1975 established a statewide program to achieve the goal of conserving and protecting land, water, air and other resources of the state. The Act was specifically designed to prevent and/or control the erosion of soil into waters of the state by regulating land-disturbing activities. Land-disturbing activities were defined very broadly to include any changes made to any land that may result in soil erosion with the exclusion of a number of specific activities and certain types of projects. The major activities that have remained exempt from the definition and requirements of land-disturbing activities include: mining; agriculture; forestry; construction of single-family homes disturbing less than one acre of land; and home gardening, landscaping, maintenance and repairs. The types of projects that remain exempt from the definition and requirements of land-disturbing activities are those below the regulatory threshold (defined as five acres in 1975 but changed to one acre in 2003) and public projects of the Department of Transportation, highway and toll way authorities, public utilities, counties and municipalities.[52] In 2003, the public project exemptions were revised and now only projects undertaken by an agent of the state or by a publicly regulated entity as the primary permittee are exempt.[53]

Governance of Land-Disturbing Activities

The E & S Act of 1975 created a statewide permit system for all land-disturbing activities (LDAs), excluding the aforementioned exemptions. Local governments were provided with the authority to continue to govern LDAs within their jurisdictions, if they chose to do so. Local governments that adopt appropriate ordinances that are at least as restrictive as the minimum requirements specified in the E & S Act and demonstrate the capacity to implement a local E & S program are certified as the local issuing authority for LDA permits.[54]

EPD, by law, acts as the issuing authority for LDA permits in jurisdictions where the local government chooses not to seek certification.[55] In the 1985 amendments to the Act, EPD was given the authority to periodically review the administration and enforcement of local programs.[56] Based on this authority EPD has occasionally decertified jurisdictions that have failed to implement their responsibilities as the local issuing authority. In the cases of revoked certification, EPD assumes responsibility for implementing the local program.

As of March 30, 2004, there were 690 local LDA permit programs statewide (Table 2). EPD was the issuing authority for one-half of the local LDA programs (345) and local governments were the issuing authority for the remaining 345 programs statewide. Of the 345 programs under EPD's responsibility, EPD is the issuing authority in 34 counties and 311 cities. Of the 345 local issuing authorities, 122 are county programs, 221 are city programs, and two are programs of consolidated (city-county) governments.

Table 2. Governance of local land-disturbing activity permit programs as of March 30, 2004

Statewide	EPD	Counties	Cities	Consolidated Governments
690	345	122	221	2
	(34 counties, 311 cities)			
Trout Stream Region				
109	53	19	37	
	(6 counties, 47 cities)			
Study Sample Area				
60	31	10	19	
	(4 counties, 27 cities)			

Data Source: EPD Erosion and Sedimentation Control Program, *Certified Issuing Authorities for the Erosion and Sedimentation Control Program*, http://www.dnr.state.ga.us/dnr.eviro.

In the 25-county trout stream region, there are 109 local LDA permit programs. EPD is the issuing authority for about one-half of the local governments (6 and 47 respectively) in the state's trout stream region, while local governments have the issuing authority in the remaining 19 counties and 37 cities. Within this study's 14 county sample, there are 60 local LDA permit programs. Again, EPD is the issuing authority for about one-half of the local programs (4 counties and 27 cities) and county governments are the issuing authority in the remaining 10 counties.

Land-Disturbing Activity Permits

As previously mentioned, the E & S Act establishes a permit system for all LDAs (excluding those activities specifically exempted from the law) to prevent sediment from entering waterways. Individuals, firms, and any other legal entity are required to apply for and obtain a permit from the appropriate issuing authority before conducting any LDA. An erosion and sediment control plan must be submitted with the permit application and the plan must be approved prior to the issuance of the permit.[57]

The LDA permit has been the primary method of implementing the state erosion and sedimentation control program. Table 3 presents the total number of LDA permits issued in the study counties per year for 1999 – 2003. These permits represent those issued for LDAs only and do not include building or construction permits. Table 3 also includes the total number of LDA permits issued over the five-year period, the number of those permits issued for LDA on land adjacent to trout streams, the percentage of LDA permits issued on trout streams as compared to the total number of LDA permits issued and the rate of growth and total trout stream miles for the study counties.

Table 3. Land-disturbing activity permits by issuing authority

County	Land-Disturbing Activity Permits					Total LDA Permits Issued (5 Years)	LDA Permits Issued on Trout Streams*	LDA Permits on Trout Streams as Percent of Total Issued	Population Growth Rate 1990-2000 (%)	Total Trout Stream Miles
	1999	2000	2001	2002	2003					
Bartow	41	48	22	39	45	195	17	8.75	36.0	257
Chattooga	8	1	5	2	4	20	Unknown	Unknown	14.5	244
Dawson **	0	0	32	25	27	84	Unknown	Unknown	69.7	165
Fannin	No Info	-	-	-	-	156	140	90.00	23.8	557
Gilmer	58	64	67	60	72	321	191	59.50	75.5	598
Habersham	31	19	29	39	33	151	2	1.50	30.0	183
Lumpkin	600	516	430	459	426	2431	1215	50.00	44.2	348
Pickens	20	41	36	35	33	165	46	28.00	59.3	261
Rabun	11	13	14	17	19	74	74	100.00	29.2	479
Stephens **	0	0	0	1	4	5	Unknown	Unknown	8.5	53
Towns **	4	0	0	9	21	34	Unknown	Unknown	38.0	219
Union	35	50	27	38	31	181	136	75.00	44.2	434
Walker	61	61	61	17	16	216	Unknown	Unknown	4.7	339
White	33	39	42	33	29	176	43	25.00	53.3	206

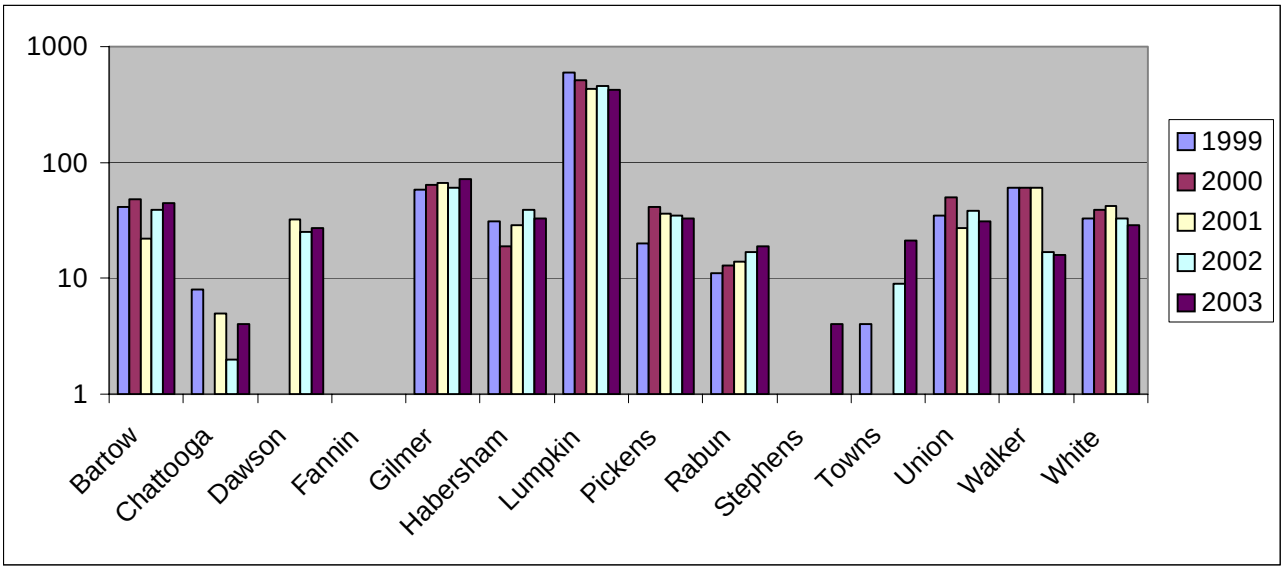
* Most counties reported estimates.

** EPD did not become the issuing authority in Dawson County until 2001 and Stephens County until 2002. Also, Towns County was the issuing authority during most of 2000 and part of 2001.

Most issuing authorities provided estimates of the number of LDA permits issued for some years (i.e., Walker County for 1999 - 2001) and one gave an estimate for the five-year period (i.e., Fannin County). The number of LDA permits issued in Lumpkin County is an order of magnitude greater than those reported for the remaining Trout Stream Buffer Study counties. Although these numbers were confirmed as representing just LDA permits, the difference should not be interpreted to represent greater growth or development rates in the county but probably reflects differences in local policies and/or record keeping practices that are unique to Lumpkin County. EPD was the issuing authority for Chattooga, Dawson, Stephens and Towns counties during most, but not all, of the five-year time period. Changes in issuing authority and personnel attrition are another reason for inconsistent or incomplete information for some counties.

The five-year trend in LDA permit issuance in each county appears to be somewhat flat in the 14 county study sample, with relatively small increases or decreases in the number of permits issued from year to year (Figure 2, note logarithmic scale).

Figure 2. LDA permits issued per year in the study counties, 1999 - 2003

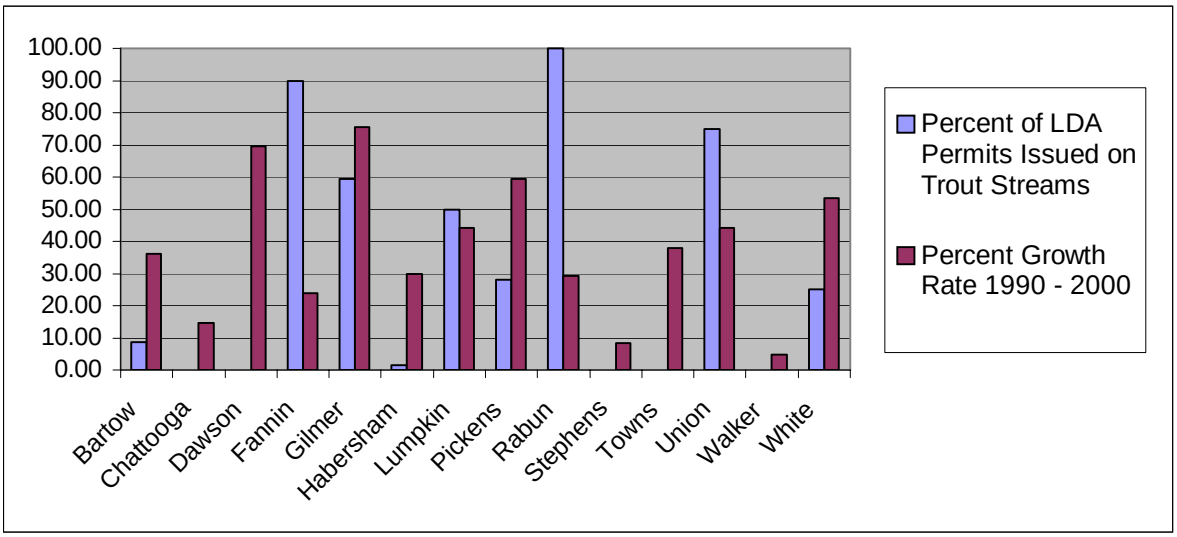


* Most counties reported estimates. Fannin County number does not appear as only the 5-year total was reported.

This relatively flat trend may seem counter-intuitive when comparing LDA permit issuance with the high rate of growth in some counties (i.e., Gilmer, Lumpkin, Union and White). Yet, the absolute number of county-wide LDA permits issued annually may not reflect a true picture of development related impact on trout stream resources because the number of LDA permits issued does not equate to the number of acres disturbed. At least some of these permits have been issued for rather large multi-unit developments, perhaps involving the disturbance of several hundred acres of land. In addition, until the 2003 amendments to the E & S Act permits were not required for construction of single-family homes; therefore, this type of prevalent development is not reflected in the total number of LDA permits issued. Further, the five-year LDA permit issuance time period does not correspond directly to the 10-year change in growth rates so that cause and effect relationships cannot be directly inferred.

The number of LDA permits issued for land adjacent to trout streams can be considered a more relevant indicator of impacts to trout stream resources than the total number issued countywide. Figure 3 compares the percentage of LDA permits issued adjacent to trout streams with the percentage of growth rates in the study counties. In five of the nine counties (i.e., Fannin, Gilmer, Lumpkin, Rabun and Union), it is estimated that half or more of the LDA permits issued have been for development adjacent to trout streams. In addition, four of these five counties have experienced high rates of growth defined as exceeding the state average of 26.4 percent during that time period and the growth rate of the fifth county (i.e., Fannin) is very close at 23.8 percent. A high rate of LDA permit issuance on trout stream waters and high growth rates indicate development pressures on trout stream resources and emphasizes the importance of buffering these resources from the impact of development.

Figure 3. Percent of LDA permits issued on trout streams and percent growth rate



Three counties have high rates of growth but a relatively low percent of LDA permit issuance on trout streams (i.e., Bartow, Habersham and White). In each of these cases, there are large portions of the county containing no designated trout streams. Perhaps development in these counties is concentrated in the non-trout stream portion of the county, although it is impossible to determine that from the data reported. Further, no information is available on the number or percent of LDA permits issued on trout streams for five of the 14 study counties (i.e., Chattooga, Dawson, Stephens, Towns and Walker). The level of development pressure on trout stream resources in these counties, therefore, is unknown.

2003 Amendments and Land-Disturbing Activities

The 2003 amendments to the E & S Act appreciably altered the state law and implementation of the state and local programs including the provisions pertaining to governance of LDAs and the LDA permit system.[58] The 2003 amendments were prompted by new federal regulations under the CWA, which resulted in duplicate requirements under two different laws, one federal and the other state.

The National Pollutant Discharge Elimination System (NPDES), a water pollution control permit program, was established under Section 402 of the CWA. One provision of the initial NPDES program required all facilities discharging pollutants into waters of the United States from any point source to obtain a permit.[59] Although the quality of the nation's waterways improved under NPDES, the early program focused on reducing pollutants from point sources only. As point sources of pollution were reduced, it became commonly acknowledged that nonpoint sources now comprise at least fifty percent of the pollutants entering the nation's waterways as stormwater runoff.

To address continued problems with water quality more comprehensively, the CWA was amended in 1987 requiring EPA to establish a phased approach to reducing stormwater runoff. In response, EPA published regulations for stormwater discharges under the NPDES program in

1990. The first phase of these regulations (Phase I) established permitting requirements for stormwater discharges from construction activities that disturb five acres or more.[60] EPA revised the NPDES permit program in 1999 by adding Phase II permit requirements applying to construction activities disturbing one or more acres of land.[61] In Georgia, the NPDES stormwater program requires most landowners, developers and others engaged in construction activities to file a notice of intent requesting coverage under the general stormwater permit. If coverage is granted, the permit applicant is required to prepare a plan for and install and maintain acceptable Best Management Practices (BMPs) to control runoff from the site based on a discharge limit for sediment. In addition, permittees are required to keep records and report on the effectiveness of the BMPs.[62]

EPD has retained responsibility for administering the federal NPDES program since 1974[63] and under federal law was required to include to the Phase I and II requirements in its program. In 2000, EPD issued a general statewide NPDES permit for construction sites five acres or larger (construction sites over 250 acres must obtain an individual NPDES permit) and issued a general permit covering one to five acres of disturbed land in 2002. These new NPDES general stormwater permit regulations overlapped with the LDA permit issued under the state E & S Act. Many believed it prudent to eliminate the confusion related to the overlapping program requirements (and the need for the regulated community to comply with both the E & S Act and CWA requirements) by aligning the LDA permit through an amendment to the E & S Act with the NPDES general stormwater permit that had the force of federal law under the CWA and the higher water quality standard.[64] This resulted in the drafting of legislation designed to address the overlapping requirements in the 2003 session of the General Assembly.

Paradigm Shift

In 2003, both the E & S Act and the GWQC Act were amended to reflect changes in the federal NPDES requirements.[65] These amendments created a paradigm shift for implementing erosion control programs at the state and local levels in Georgia including governance of LDAs, training requirements, the permit process and the initiation of a permit fee system in lieu of monitoring requirements.

A major change involved program governance as defined by the term ‘issuing authority’. The 2003 amendments to the E & S Act removed EPD as an issuing authority and changed the definition of the term to specify only to local governments as a ‘local issuing authority’.[66] This change in definition shifted the role of EPD from regulator at the local level parallel with local governments to one limited to state program administration. Governance was also affected by increased requirements for training at the local level. With the 2003 amendments, all persons involved in land development design, review, permitting, construction, monitoring, or inspections or any LDA after December 31, 2006, are required to meet education and training certifications that are developed by the Georgia Soil and Water Conservation Commission (GSWCC). In addition, these individuals must maintain certification by completing at least four hours of continuing education every three years.[67] The training requirements may increase local capacity to administer and enforce erosion and sedimentation control programs and increase operator capacity to remain in compliance with erosion and sedimentation control requirements.

The LDA permitting process was the focus of another major change in 2003, when the permitting requirements under the E & S Act were coordinated with those for the NPDES general stormwater permit. Permit applicants in certified jurisdictions are required to submit requests for LDA permits to the local issuing authority. Permit applicants in the jurisdiction of non-certified local governments are required to submit a Notice of Intent to EPD for coverage under the state NPDES general stormwater permit. The dual permit system remains in place (local governments implement the LDA permits under the E & S Act and EPD implements the statewide general permit under the GWQC Act) yet the requirements under each permit have been aligned.

To facilitate this alignment and to provide local issuing authorities with the opportunity to integrate the requirements with other local land development ordinances, local governments must revise and adopt a local LDA permit ordinance by July 1, 2004. To be approved by EPD, the local LDA permit must be at least as stringent as the state NPDES general stormwater permit but may not exceed the general permit in monitoring, reporting, inspections, design standards, turbidity standards, and education and training requirements.[68]

The 2003 amendments to the E & S Act also refer to a primary and secondary permittee category as defined in the NPDES general permit. These categories help distinguish between the oversight responsibilities of landowners, corporations or public agencies from the onsite activities of contractors, subcontractors, operators or others. This shift attempts to place regulatory compliance responsibility on the site operator instead of the property owner. The 2003 E & S Act amendments require local issuing authorities to inspect and enforce the locally issued permits and further authorize the local issuing authority to regulate both types of permittees, including taking enforcement actions against many previously exempted projects and organizations if they are a secondary permittee.[69]

A further major change resulting from the 2003 amendments was the establishment of a permit fee system as a condition of permit issuance. The permit fee is expected to offset the costs of statewide implementation of the NPDES general stormwater permit or the local LDA permit. (The GWQC Act also was amended to provide authority for the new permit fee system under the NPDES general stormwater permit.) The fee was capped at $80.00 per acre of disturbed land and its use is prohibited for purposes other than implementation of the state and/or local erosion and sedimentation control programs. If the land disturbance will occur in the jurisdiction of a certified local issuing authority, then one-half of the levied fee is rendered to the local government and the remaining half to EPD. In jurisdictions with no local issuing authority and permit coverage under the general permit, EPD retains the full amount of the fee.[70]

Governance of Land-Disturbing Activities and LDA Permits under the 2003 Amendments

All of the local governments in the Trout Stream Buffer Study that were certified as local issuing authorities prior to the 2003 amendments (10 of 10) intend to continue their status under the new NPDES general stormwater permit and revised E & S Act. The reasons given for continuing as local issuing authorities are primarily related to two factors. First, local governments want the ability to control the rate of development. Prior to the 2003 amendments, LDA permit applications that were submitted to EPD generally took longer to process and issue

than those made to local issuing authorities. Although coverage under the NPDES general stormwater permit is now automatic and construction may commence 14 days after the notice is submitted,[71] local governments continue to believe that local control of development rates and patterns is advantageous to the local economy and responsive to developers. The second reason given for retaining local issuing authority status is based on the belief that local governments are better positioned than the state to implement erosion and sedimentation control requirements within their jurisdictions. Many believe that they are more highly committed to 'doing the right thing' environmentally and so choose to retain local control of erosion and sedimentation.

Over half of the local government issuing authorities in the study (6 of 10) report that the 2003 amendments to the E & S Act have resulted in little to no effect on the local LDA permit process. Two of the six report that it is too early to see the effects of the amendments. Since local issuing authorities had until July 1, 2004, to submit a revised local ordinance, changes to the implementation of the local program have not become effective and the effects of those changes are not yet apparent. Of the counties experiencing effects (four), the following comments represent the type of concerns related to the 2003 amendments.

- *HB 285 has complicated the process of LDA permit issuance because of the complexity of obtaining approval from the state and the multiple requirements therein.*
- *[These] amendments have created more work and labor for our program.*
- *There has been some confusion regarding which county projects are exempt.*
- *[The] 1995 Soil Erosion law before NPDES required permits was more effective in bringing LDA into compliance. The LIA had more control over LDA before HB 285; at the present time the local government has less control.*

IMPLICATIONS OF THE 2003 AMENDMENTS

Potential implications resulting from alignment of a state and federal program and the implementation of a permit fee system under the 2003 amendments to the E & S Act and the GWQC Act should caution local governments to weigh the benefits and risks of their continued status as a local issuing authority. One purpose of the 2003 amendments was to align the E & S Act permitting program (a state program) with the NPDES permitting program for stormwater discharges under CWA (a federal program). By aligning the programs so closely, it is possible that environmental liability for local governments may be increased. In addition, the distribution of permit fee proceeds may not be equitable, thus raising the allegation that such fees are effectively a tax in some instances.

Local Government Liability

State and local governments manage risks that can adversely affect the environment and/or human health. Regarding environmental management, local governments often play a dual role. Local governments operate or manage services such as water and wastewater treatment, construction and maintenance projects, solid waste management facilities, and public safety, and are thus part of the regulated community. Local governments also serve as regulators through implementation of land use planning and zoning programs and the erosion and sedimentation control program. The International City/County Management Association states that environmental liability of local governments results from legal obligations caused by those activities and programs.[72] Liability arises under both statutory law and common law doctrines. Local governments that are held liable for violating federal, state, or local environmental laws can be required to pay fines and penalties and/or to incur other compliance costs. In extreme cases, local officials may be subject to prison sentences.[73]

As part of the regulated community, local governments generally incur the same liabilities for compliance with federal and state environmental laws as business and industries. Governmental facilities are subject to enforcement actions and the same fines and penalties for violations of laws, rules and permit conditions. Land-disturbing activities undertaken by local governmental entities will continue to be regulated under the appropriate statutory scheme.

As regulators, local governments are also subject to the requirements of federal and state laws. The federal Clean Water Act requires EPA to administer water pollution control programs, but allows the agency to delegate administration of these programs to states under certain conditions. The GWQC Act establishes the state's legal authority under which EPD received federal program delegation and now administers federal Clean Water Act programs. The E & S Act authorizes EPD and local governments to administer erosion and sedimentation control programs. The 2003 amendments to these state laws intentionally linked their implementation through a joint permit fee system and certain permit requirements.

In the 2003 amendments to the GWQC Act, the General Assembly expressed its intent to partially fund the implementation of the policies established in the GWQC Act and the E & S Act through a permit fee system. The General Assembly further declared its intent to restrict the

fee proceeds for administration of the E & S Act by EPD or a local issuing authority, or the NPDES general permit.[74] The programs are thus joined through a common funding mechanism.

The 2003 amendments also made substantial modifications to the permitting scheme. First, the amendments deleted the definition of "issuing authority," thus removing EPD from its traditional role as an issuer of land-disturbing activity permits in certain areas of the state. A new definition of "local issuing authority" was subsequently created to include only certified county and municipal governments. Under the revised scheme, applications for an individual land-disturbing activity permit must be submitted to the appropriate local governing authority in certified jurisdictions. Those jurisdictions are responsible for processing (with the respective soil and water conservation district), issuance, inspection, and enforcement of the permit. In a December 2003 memorandum, EPD informed then-certified local issuing authorities that they had until July 1, 2004, to adopt the revised model erosion and sedimentation control ordinance or face decertification.[75] The memorandum further states that once the model ordinance is adopted, "all subsequent local land-disturbing activity permits must mirror the NPDES general permit requirements."[76]

In uncertified areas, a notice of intent for coverage under the state general permit is submitted to EPD. Coverage under the permit is automatic, "provided without acknowledgement from EPD".[77] Since the provisions of the state general permit are essentially self-administered, EPD has little direct role in permit administration. Since local governments may also face liabilities for unlawful acts in their capacities as regulators, concerns may be raised by providing additional pressure on the already overburdened local government programs.

The EPA and the United States Army Corps of Engineers (USACE) have also recognized the significant role that local governments have in implementing the E & S Act and the storm water provisions of the CWA. In a draft letter, these agencies caution local governments also to ensure compliance with Section 404 (wetlands permitting provisions) of the CWA "so as to maintain economic growth and avoid potential litigation or enforcement actions."[78]

The concerns of the federal agencies appear to be connected with misinterpretations made by some LDA permit applicants. The agencies believe that applicants may be interpreting the issuance of a local LDA permit as also providing approval under federal wetlands regulations. This confusion is further complicated when applicants consider determinations of state waters (required under the E & S Act) to be the same as determinations of jurisdictional waters (required under the CWA). The EPA and USACE consider it the responsibility of the local issuing authority to ensure that applicants for LDA permits hire a qualified professional to undertake a formal delineation of jurisdictional waters. The delineation also must be verified in writing by the USACE and submitted as part of the local permit application.

> Local governments that inadequately inform developers of the need for Section 404 permits may be at significant litigation risk and we have recently seen an increase in citizen suits under the Clean Water Act involving this issue. Also, it should be noted that EPA has had Section 404 enforcement actions with more than half of the Metro Atlanta counties themselves, which resulted in increased project costs and considerable adverse media coverage.[79]

In recognizing that local governments are usually the first stop for developers, the agencies consider that local governments have a significant role in ensuring that developers comply with all federal and state laws and regulations.[80] This interpretation by EPA and USACE not only places compliance responsibility for all federal and state regulations squarely on the shoulders of certified local issuing authorities, it may also add to local governmental environmental liability exposure.

Permit Fee Equity

As discussed above, the state and local governments have different roles and responsibilities in administering and enforcing the LDA permit and the NPDES general stormwater permit. It may be argued, therefore, that the level of services provided by the local issuing authority and the state in return for payment of the permit fee is different as well. The permit fee system was originally discussed as a means for addressing the budget shortages at the state and local levels that have produced chronically under-staffed state and local erosion and sedimentation programs, especially related to adequate enforcement. Negotiations with the regulated community lead to support for the permit fee system in return for relief from the previously required monitoring under the E & S Act.[81] As previously stated, the role of EPD in the permits issued under the E & S Act was substantially reduced in the 2003 amendments.

The E & S Act allows EPD to review actions of the local issuing authority including program administration and enforcement of the local ordinance.[82] In addition the Rules for Erosion and Sedimentation Control allow EPD to inspect the sites for which a local LDA permit has been issued "to evaluate the effectiveness of the erosion and sediment control measures employed."[83] Yet the Georgia Soil and Water Conservation Districts (Districts), which are comprised of non-paid appointees and the GSWCC are required to provide primary oversight of local issuing authorities, inspecting the effectiveness of the local programs and reporting noncompliance to EPD.

> The districts or the commission or both shall periodically review the actions of counties and municipalities which have been certified as local issuing authorities pursuant to subsection (a) of this Code section. The districts or the commission or both may provide technical assistance to any county or municipality for the purpose of improving the effectiveness of the county's or municipality's erosion and sedimentation control program. The districts or the commission shall notify the division and request investigation by the division if any deficient or ineffective local program is found.[84]

In jurisdictions with a certified local issuing authority, the LDA permit applicant must render one-half of the $80.00 per acre of disturbed land fee to the local government and the remaining half ($40.00 per acre of disturbed land) to EPD.[85] Since the direct role of EPD in administering the local LDA permit program was substantially reduced in the 2003 amendments (and arguably the responsibility of the local issuing authority correspondingly increased), the regulated community may contend that the $40.00 per acre of disturbed land fee paid to EPD is required for little or no direct service. Fees required for services that are not directly rendered

more closely resemble a tax. In addition, local issuing authorities may reason that full program responsibility merits receipt of the full permit fee.

In the Trout Stream Buffer Study counties, the permit fee generally is perceived to be a benefit by the local issuing authority and a burden by the regulated community. The following comments express these positions.

- *The added forty dollar fee, while not equivalent in cost to possible local impact fees and more appealing to development interests than the latter, is a revenue producer and therefore beneficial to supporting administration of the revised mandates.*
- *[Mostly there are] complaints regarding the cost.*

A common effect of major shifts in policy is the unintended consequences of the change. The 2003 amendments to the GWQC Act and the E & S Act created a significant shift in the policy paradigm of these laws and the administration of the associated programs. A thoughtful review of the implications raised here for local governments and the state is merited. There are many benefits to local governments in retaining certification as a local issuing authority. Local governments have more direct contact with their communities and are often best able to direct growth and respond to development concerns. Yet, there may be some risks associated with this status as well. A prudent weighing of the responsibilities and risks of being a local issuing authority will best serve local government interests. In addition, a thorough research of the constitutionality of fee requirements where no direct services are provided may help protect the state from actions undertaken by the regulated community.

BUFFERS ON TROUT STREAMS

Buffers provide many different benefits depending on the resource or activity being protected, the width of the buffer, and the quality of the land that comprises the buffer. Undisturbed, naturally vegetated buffers provide water quality, aquatic habitat and fisheries benefits for trout streams and warm waters. Considerable research has been conducted on the appropriate width of buffers to gain these benefits.[86] In Georgia, buffers are required on all state waters. Who makes the jurisdictional determination on state waters and the process used to make those determinations can impact which trout streams and/or warm water streams are protected. Attempts were made in 2000, to clarify the state's buffer policy and its implementation. Similar clarification for jurisdictional determinations of state water could increase the ease of implementing the buffer policy and provide greater water quality, aquatic habitat and fisheries benefits.

Benefits of Buffers

Buffers are areas of land deemed prudent to leave in an undisturbed, naturally vegetated state. Buffers are most often associated with areas adjacent to streams, rivers, springs, lakes and reservoirs but any land area or land-use that is enhanced by protection can benefit from buffers. For instance, buffers adjacent to roadways, industrial facilities or dangerous areas can provide noise, visual and safety protection benefits. The prudence of establishing and protecting buffers adjacent to watercourses is most often associated with water quality and aquatic health but other benefits are realized also as described by the Stream Buffer Variance Technical Advisory Committee.

> Buffers on state waters protect and conserve land and water resources in a number of ways, including filtering sediment out of storm water runoff. Protection of stream buffers helps maintain the overall physical, chemical, and biological water quality of a stream. A buffered stream provides habitat for fish, salamanders, aquatic insects and other animals; it processes and cycles nutrients; it provides hydraulic roughness that slows down flood flows and traps some sediment and debris; it provides a place for recreation and education; and it provides a scenic amenity.[87]

Trout streams and trout fisheries are especially vulnerable to water quality degradation and detrimental alterations to the aquatic system. Undisturbed, naturally vegetated buffers adjacent to trout streams, therefore, are particularly important. Trout stream buffers help protect water quality by filtering nutrient runoff and help protect stream banks from erosion preventing loss of property. The shade from trees over streams helps keep water temperatures cool and the tree root systems hold stream bank soils in place preventing the smothering of trout eggs and aquatic insects. Buffers provide a major food source for trout; tree leaves and sticks are food for bacteria and aquatic insects, which in turn provide food for larger stream invertebrates and fish. Tree trunks and limbs that fall into streams from vegetated buffers create vital resting, hiding and feeding areas for trout and aquatic insects.[88]

Determining Buffer Widths

There is no single ideal buffer width because each of the values or functions to be protected (i.e., bank stabilization, aquatic food web, water temperature moderation, nutrient removal, sediment filter, flood mitigation, and wildlife habitat) is associated with a different minimum buffer width requirement. For instance, for long-term control of sediment, phosphorus, pesticides and toxins, a 100-foot buffer may be effective. Bank stabilization and flood control may be accomplished with buffers of 30 to 200 feet. A 50 to 400 foot buffer is recommended to maintain aquatic insect populations and provide fish habitat, while the regulation of water temperatures may need buffers of 30 to 100 feet wide. Further, to provide wildlife habitat corridors that support the movement of animals and plants, a 30 to 200 foot buffer may be needed, while bird populations often require buffers up to 300 feet wide. To maintain healthy fish populations, some scientists recommend a buffer at least as wide as the height of trees (about 100 feet) with the desirable width equaling the height of three trees (300 feet). Further, to provide the shade required to regulate trout stream water temperatures, the buffer must be wide enough to support more than a single row of trees to reduce the risk of total loss of tree cover related to storm blow-downs.[89]

In addition to different buffer widths for meeting different benefits, buffer width variability is related to the great differences in site-specific conditions. In other words, the appropriate buffer width depends not only on what is to be protected but also on what the landscape is like where that protection is desired. Some of the landscape features and factors that can be considered in determining site-specific buffer widths include: stream order; steepness of slope; soil type; depth to groundwater; upstream land uses and pollution inputs; width of floodplain; stability of stream corridor; low, normal and peak runoff volumes; and presence, extent and value of the resource being protected.[90]

A fairly common criticism of buffer regulations is the lack of a scientifically defensible buffer width. Yet to design buffer regulations that meet scientific standards related to protecting specific resource values and that accommodate site-specific landscape features would result in variable buffer widths. This means that on any given 100-foot length of trout stream bank, a section with generous floodplains may require a 100-foot wide buffer, while another section with steep slopes may require a 150-foot wide buffer and yet another section of the bank may merit a 200-foot wide buffer. Determining the scientific defensibility of resource- and site-specific buffer widths requires a tremendous investment of time and money by the landowner, developer, governing authority, state or others. Implementing a variable buffer width (measuring it on the ground, designing the construction site to accommodate it and enforcing protection measures) also would require a tremendous resource investment, one that would prove cost-prohibitive and onerous for all parties involved.

Georgia's Buffer Policies

Buffer policies based on a fixed buffer width requirement are an alternative to the issues associated with resource-specific and site-specific variable buffers. Georgia first initiated buffer requirements in the 1989 amendments to the E & S Act using a mix of variable and fixed buffer widths. In the 1989 amendments, all LDAs were prohibited within the 100-year floodplain (a

variable width), a 100-foot buffer was established for trout streams and a 25-foot buffer was required for all other waters of the state (warm waters).[91] The variable width requirement related to the 100-year floodplain was removed in the 1994 amendments to the E & S Act,[92] most likely due to the burden of administering an imaginary line on the ground that moves laterally along a stream bank. Issues related to measuring the two fixed buffers were also clarified in these amendments using the concept of measuring buffers from the point where vegetation has been wrested (pulled, forced or moved)[93] by normal stream flow or waves.[94]

Even with this straightforward approach to setting buffer width policy and attempts to simplify buffer requirements, effective implementation (especially of the 100-foot trout stream buffer) remained problematic with all stakeholders including landowners, the regulated community, the environmental community and issuing authorities. Buffer regulations for trout streams, therefore, were overhauled in the 2000 amendments to the E & S Act beginning with codifying a definition of the term 'buffer' for the first time. Buffers (for trout and water warm streams) are defined as "…the area of land immediately adjacent to the banks of state waters in its natural state of vegetation, which facilitates the protection of water quality and aquatic habitat."[95]

Although the buffer width for warm waters was not changed in the 2000 amendments, buffers for designated trout streams were reduced to a 50-foot width measured horizontally from the point on the bank where vegetation has been wrested. Buffer width requirements for small springs and trout streams discharging an average annual flow of 25 gpm or less were reduced even further to 25 feet. In addition, landowners are permitted to pipe these small springs and streams up to 200 feet and to the edge of their property (this provision is discussed below in detail).[96] Certain projects are completely exempt from buffer requirements including construction of roadway drainage structures[97] and stream crossings for water and sewer lines, if the crossing is within 25 degrees of perpendicular to the stream, the buffer disturbance is not wider than 50 feet and adequate erosion control practices are used.[98]

Under the standard administration of buffer requirements, no LDAs are permitted within the 50-foot trout stream buffer until all land-disturbance on the site is completed. Once construction is finished and the site stabilized, the buffer may be thinned or trimmed as long as the tree canopy continues to provide protective shade and enough vegetation remains to protect water quality and aquatic habitat. Although a 50-foot buffer is required for the construction of single-family residences that disturb less than one acre and are under contract with the owner for his occupancy and not part of a larger development, this type of development is not required to wait until the site reaches final stabilization prior to thinning or trimming the buffer under the protective provisions mentioned.[99]

Local governments are permitted to adopt more stringent buffer widths in their local ordinances than the 50-foot minimum specified in the E & S Act.[100] At least one county in the Trout Stream Buffer Study has taken this step to protect water quality values.

> *Habersham County's buffer requirements are more restrictive than the State's. The county left buffer width at 100 feet except for individual homeowners and existing permits because three-quarters of the county falls under the Part 5*

Criteria for Water Supply Reservoirs. I like the 100-foot buffer requirement because the county is growing so rapidly and there is no way to prevent erosion on large development projects except through buffers.[101]

In addition, local elected officials have commented favorably on the ease of administering the 50-foot fixed trout stream buffer width. It applies to all state waters and to every LDA permit application. If a developer has a construction design that requires intrusion in the 50-foot trout stream buffer, they must apply to EPD for a variance from the buffer requirements before the local issuing authority can issue a permit. The ease of administering this buffer requirement is likely the result of it being fixed, not that it is 50-foot. A fixed buffer of any width would be equally easy to administer.

State Water Determinations

The presence of state waters triggers the requirements for protecting stream buffers or alternately the buffer variance request process, if relief from the buffer requirements is desired. The legal definition of 'state waters' has not changed since the E & S Act was adopted in 1975. State waters are "…any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership or corporation."[102] Yet taking this concept from a narrative form to a jurisdictional determination of a small water body on the ground has proven difficult and elusive. The basic questions are at what point (or under what characteristics) does water running across or under the land become state waters and how subjective is the interpretation. Confusion over who makes these determinations and how they are made has significant implications for which resources receive protection and which hydrologic characteristics do not.

In a June 14, 2004, memorandum to local issuing authorities, the EPD Director states that it is the responsibility of the local issuing authority to identify and make a determination of the presence of state waters.[103] The EPD Director states that the following factors **<u>are not</u>** to be considered in state waters determinations for stream buffer protection:

- Whether a stream appears on a topographical map as a solid or dashed blue line (the presence of a blue line is an indication of state waters, but not all streams are mapped as blue lines);
- Whether the stream originates on the property;
- Whether a stream that originates on the property flows into another stream before it leaves the property;
- The amount of water in the stream at any given time, i.e., under normal conditions;
- The duration of water flow in the stream;
- The watershed area, unless a scientific correlation between wrested vegetation and watershed area has been made by the Issuing Authority; or
- The absence of observable aquatic life.[104]

The memorandum advises that state water determinations ought to be based on an analysis of the topography in an erosion and sedimentation control plan or a soils or topographical map of the area (the appropriate scale of the map is not specified). If an accurate determination cannot be made based on these materials, an onsite inspection of the project area may be essential.[105] The actual practices of local issuing authorities, however, indicates there is a great variety of methods and approaches being used in making state water determinations. The variety demonstrated in the following statements from Trout Stream Buffer Study counties show the confusion that exists surrounding what is/is not a state water and whose responsibility it is to make the determination.

- *State waters are defined in our Zoning Ordinance and the project engineer is required to determine and certify on development plans whether or not state waters are present on their project.*
- *Richard King, SWCD Rome Office, has determined that all streams in [the] County are considered trout streams and/or State waters.*
- *All waters in [the] State [are] classified as State Waters.*
- *We use [the] State waters definition in State E & S Regulations.*
- *Use definition of state waters listed in E & S Act and primary, secondary or first order trout stream designations in accordance with Georgia Water Quality Control Act.*
- *EPD has asked [the] County as an issuing authority to determine if a water is to be 'state waters'.*
- *Fisheries Division [Wildlife Resources Division, Georgia DNR make the determination].*
- *We typically use the perennial stream definition. If it flows year-round, it is state waters. The wrested vegetation criterion becomes questionable in urbanized areas. Impervious surfaces cause greater volumes and velocities of runoff, which could artificially cause a wrested vegetation condition.*
- *First we look at the USGS maps, then we compare them to the Fish and Wild Life Maps of Trout Streams [Wildlife Resources Division, Georgia DNR), then we do a [site] visit.*
- *We look at the property to see if there is any running water leaving the property.*

Based on these comments, it is apparent that only six of the ten local governments actually make state waters determinations. Just one of those, however, reported a determination process resembling that outlined in the June 14, 2004, memorandum (an analysis of published topographical maps, a review of WRD's trout stream maps [not to be relied on as a final determinate due to the large scale of the maps] and then a site visit). Two of the six local governments report using factors that the EPD Director expressly states "**are not** to be considered in state water determinations for stream buffer protection"(perennial streams and confined to property). Three local governments allow others to make the state water determinations (also conflicting with the direction provided in the June 14, 2004 memorandum). One of the three allows the project engineer to make determinations, which may create a conflict of interest since the project engineer primarily represents the development community that benefit most from negative determinations.

EPD, acting as the issuing authority for Chattooga, Dawson, Stephens and Towns counties, makes determinations of state waters using the following method.

Determinations of state waters are made using plan review and site inspections. If a plan shows a topographic feature that could indicate state waters, a site inspection is scheduled. During the site inspection the drainage feature would be evaluated for wrested vegetation in order to determine if a buffer is required.

The legal definition of state waters is very broad, virtually including all surface and ground water bodies. Yet the legal definition of state waters does not include the requirement for the presence of wrested vegetation in making a state waters determination. It may be that EPD considers the presence of wrested vegetation a pre-existing requirement for state water determinations because it is the point from which to measure the buffer. If so, the E & S Act should be amended to clarify the legal definition of state waters by including a requirement for the presence of wrested vegetation.

Despite state directives declaring that it is the responsibility of the local issuing authority to make accurate state water determinations, neither the authority nor the responsibility to do so is stipulated in state law. The authority to make state water jurisdictional determinations is not delegated to local governments in the E & S Act[106] or the GWQC Act[107] nor is the responsibility to make these determinations provided to local governments in the Rules of Water Quality Control.[108] In addition, it is not a criterion for certification as a local issuing authority or a responsibility of certified local issuing authorities as specified in the Rules of the Erosion and Sedimentation Control.[109] In fact, in the Buffer Variance Procedures and Criteria section of the Rules it states that EPD will consider, among other factors, "the locations of all state waters with vegetation wrested from the channel on the property as determined from field inspection" in determining whether to issue a variance, which seems to indicate a state responsibility for determining state waters.[110]

Arguably the state water determinations should be made at the local government level. Staff with one of the Trout Stream Buffer Study counties makes the case in the following statement.

State waters determinations should be made at the local government level. Local personnel may make 5 – 6 determinations a day in normal course of inspections. The state does not have the resources to do this and locals lack confidence in the state to do it better.[111]

Clarifying the confusion surrounding determinations of state waters is critical to the administration of the E & S program, particularly the buffer and buffer variance provisions. If it is deemed best for local governments to make state water determinations, the E & S Act should be amended to delegate the authority to undertake this responsibility to local issuing authorities. In addition, clear guidance on how to make these determinations should be adopted as a rule and incorporated into the LDA permit training curriculum.

VARIANCES FOR BUFFER REQUIREMENTS

Despite the water quality, habitat and fisheries benefits gained by protecting an undisturbed, naturally vegetated buffer along trout streams, there are circumstances when protecting the buffer as required by the E & S Act is not practical. In certain circumstances, a variance may be granted that provides permission for construction to intrude into the stream buffer and documents adequate erosion control measures and mitigation practices to minimize buffer impacts as provisions of the LDA permit. Because buffers provide important protection benefits and they preclude development on some sites, variances for buffer requirements have been a sensitive topic, with stakeholders nearly evenly divided on whether too many or too few are granted. This section presents information on the number of variances granted and help dispel some misperceptions.

Georgia's Variance Policies

Although the E & S Act stipulated that individuals could appeal the issuing authority's decision to the appropriate County Superior Court,[112] variances were not provided in the E & S Act until buffer requirements themselves appeared in the 1989 amendments.[113] The 1989 amendments also authorized the Director of EPD to grant a variance to the 100-foot trout stream buffer requirement.[114] The 1994 amendments further authorized the Director of EPD to grant a variance to the 25-foot buffer requirement for warm waters.[115] In 1995, amendments again altered the buffer variance provisions, prohibiting variances for single-family residences on primary trout waters and on first order trout waters (streams into which no other streams flow except for springs) but authorizing the Director of EPD to grant variances to no less than 25 feet for single family residences on secondary trout waters.[116]

With the repeated changes to the variance provisions and no stated decision criteria, the process seemed like a moving target contributing to a commonly expressed frustration surrounding the topic in the mid to late 1990s. Understandably, the local issuing authorities and the regulated community may have been confused about which provisions were applicable at any given time. As well, it is understandable that many believed that the variance requests were arbitrarily and uniformly denied when at least some denials must have been based on recent changes to the law. Further, the continued expansion of circumstances under which variances could be granted increasingly alarmed those concerned with degradation of water quality, stream habitat and fisheries. The environmental community was desirous of advancing, not reversing, the policy of the state and the intent of the E & S Act, "to strengthen and extend the present erosion and sediment control activities and programs of the state".[117] Virtually all stakeholders agreed on one point, the variance process seemed to be tremendously problematic.

Buffer Variance Criteria

In response, the 2000 amendments to the E & S Act included requirements for the DNR Board to adopt rules by the end of the calendar year specifying criteria the EPD Director must use in granting or denying variances on warm-water and trout streams. In October 2000, the DNR Board promulgated warm-water and trout stream buffer variance criteria in its rules and regulations based on the guidance provided by the Stream Buffer Variance Criteria Technical

Advisory Committee. The Director of EPD, therefore, is authorized to grant a variance to the buffer requirements if the stream variance application request meets at least one of the following criteria:

- unusual topography prohibits opportunity for any development;
- unusual circumstances create an extreme hardship;
- construction or repair of structures that are by their nature located in the buffer;
- projects that restore and enhance the buffer for improved water quality and/or aquatic habitat quality;
- buffer intrusion is necessary to access property;
- intrusion is for gravity-flow sewer lines that cannot be placed elsewhere;
- utility line crossings; or
- recreational foot trails and viewing areas.[118]

Beginning in 2001, the applicant selects the criterion or criteria they deem relevant in considering their buffer variance request and documents the criteria on their application. In addition, the applicant must document that they have attempted to configure the footprint of the development on the site without encroaching on the buffer. If a variance is issued, EPD releases it for public notice and the applicant is required to post notice of the variance in the local legal newspaper.

In 2002, EPD lost an administrative appeal for the denial of a buffer variance that had been requested under the unusual circumstances criteria. Because buffer variance decisions based on the unusual circumstances criteria remained somewhat subjective, EPD instituted the following administrative guidance for use in reviewing this type of buffer variance request. Variances would be granted if:

- Substantial pre-construction costs for the project were expended prior to November 2000 when DNR's new stream buffer variance rules went into effect.
- The unavailability of alternative sites or additional property in order to avoid encroachment into the stream buffer.
- Alternative site plans would not provide the necessary economic yield to make the project feasible.
- The proposed plan and configuration were determined to be more protective of the environment than existing site conditions.[119]

A diminishing number of buffer variance requests submitted under the unusual circumstances criterion will be applicable due to the November 2000 project initiation deadline specified in the administrative guidance.

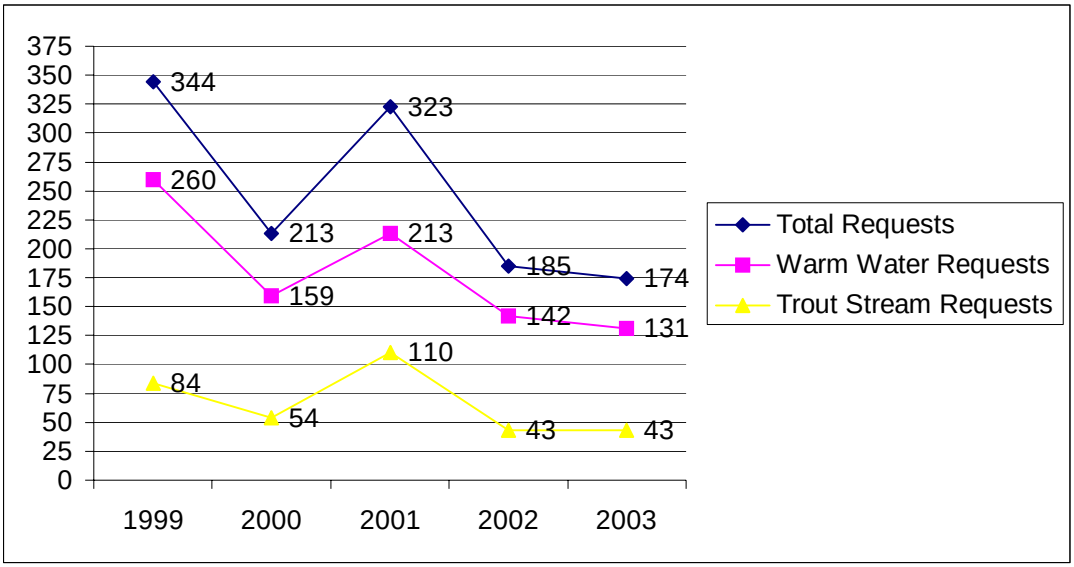
Prior to the development of these criteria, the 1994 E & S Act amendments provided the only guidance on buffer variance decisions stating that variances to the 25-foot buffer could be granted, if the Director of EPD determined that the variance is equally protective of natural resources and the environment.[120] With the 2003 amendments to the E & S Act and GWQC Act, the buffer variance provisions have been duplicated in the NPDES general stormwater permit and the buffer variance criteria apply for jurisdictions where there is no local issuing authority

and the NPDES general stormwater permit is effective in lieu of a LDA permit.[121] The development of the buffer variance criteria has formalized the buffer variance decision process rendering it more objective and transparent. The formalization of the buffer variance request process through the application of criteria supports the objectivity of the decision process and engages the applicant in decision review.

Trends in Stream Buffer Variances

Tracking the submittal of buffer variance requests and looking for trends, if any, in the determination of those requests (number approved versus denied) is one way to assess the effectiveness of the variance procedures. Figure 4 shows the total number of stream buffer variance requests made statewide from 1999 – 2003. It also shows the number of requests that were made for variances in counties with no trout streams (i.e., warm waters) and those made for variances in the 25 counties with trout streams. Not all of the variance requests in the 25 county trout stream region of the state indicate intrusion into actual trout stream buffers as most of these counties also have miles of non-designated trout streams or warm waters. Because of the manner in which the data are recorded, it is not possible to separate true trout stream buffer variance requests from others made in those counties for all years. It is reasonable to expect that the trend in buffer variance requests made for intrusion into trout stream buffers, however, generally mirrors those made county wide in the 25 trout stream counties.

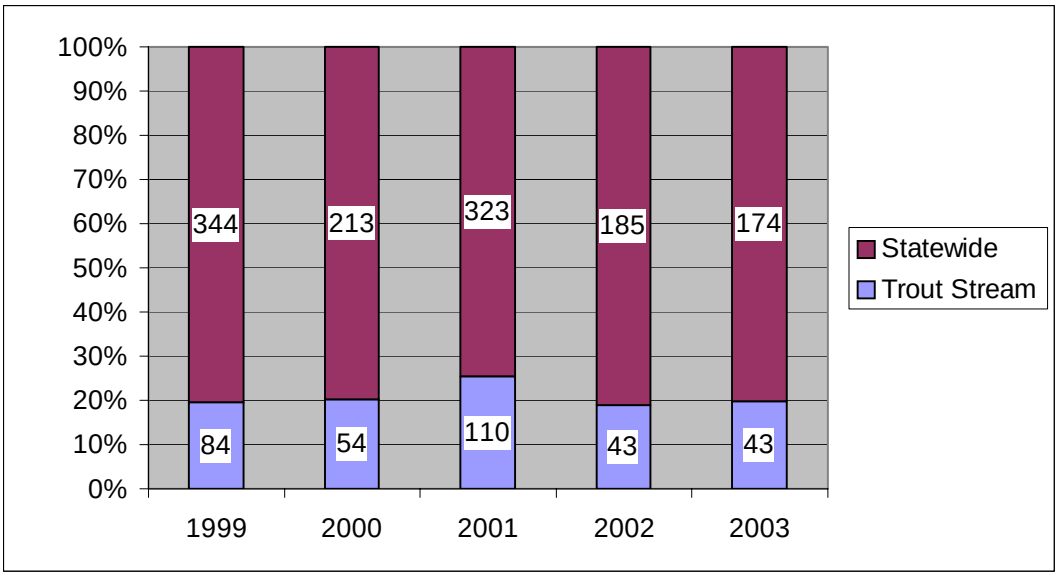
Figure 4. Stream Buffer Variance Requests, 1999 - 2003



There seems to be considerable variability in the absolute number of requests made from year to year as seen in Figure 4. This variability also is repeated in the number of variances requested for both trout streams and warm waters. Importantly, there does not appear to be an increasing trend in the number of requests made statewide over this five-year period; nor is there an increasing trend in variance requests for either trout streams or warm waters. In fact, Figure 5 shows that the percent of trout stream buffer variance requests compared with the total requests statewide has remained fairly stable over the five year period, hovering in the 20 to 25 percent range. Considering that the 25 trout stream counties represent 16 percent of the state's 159

counties, Figures 4 and 5 may indicate slightly higher than average development pressures in trout stream counties, but not by much.

Figure 5. Percent of trout stream buffer variance requests to total requests statewide.



Buffer variance request applications must contain specific information on the site and the construction design. After 2000, the applications also had to provide the reason(s) intrusion into the buffer was considered necessary by specifying the criterion under which the request was made. EPD reviews and acts on the request based on this information. The number of stream buffer variance requests made statewide and the disposition of those requests for the five-year, 1999-2003, time period is shown in Table 4.

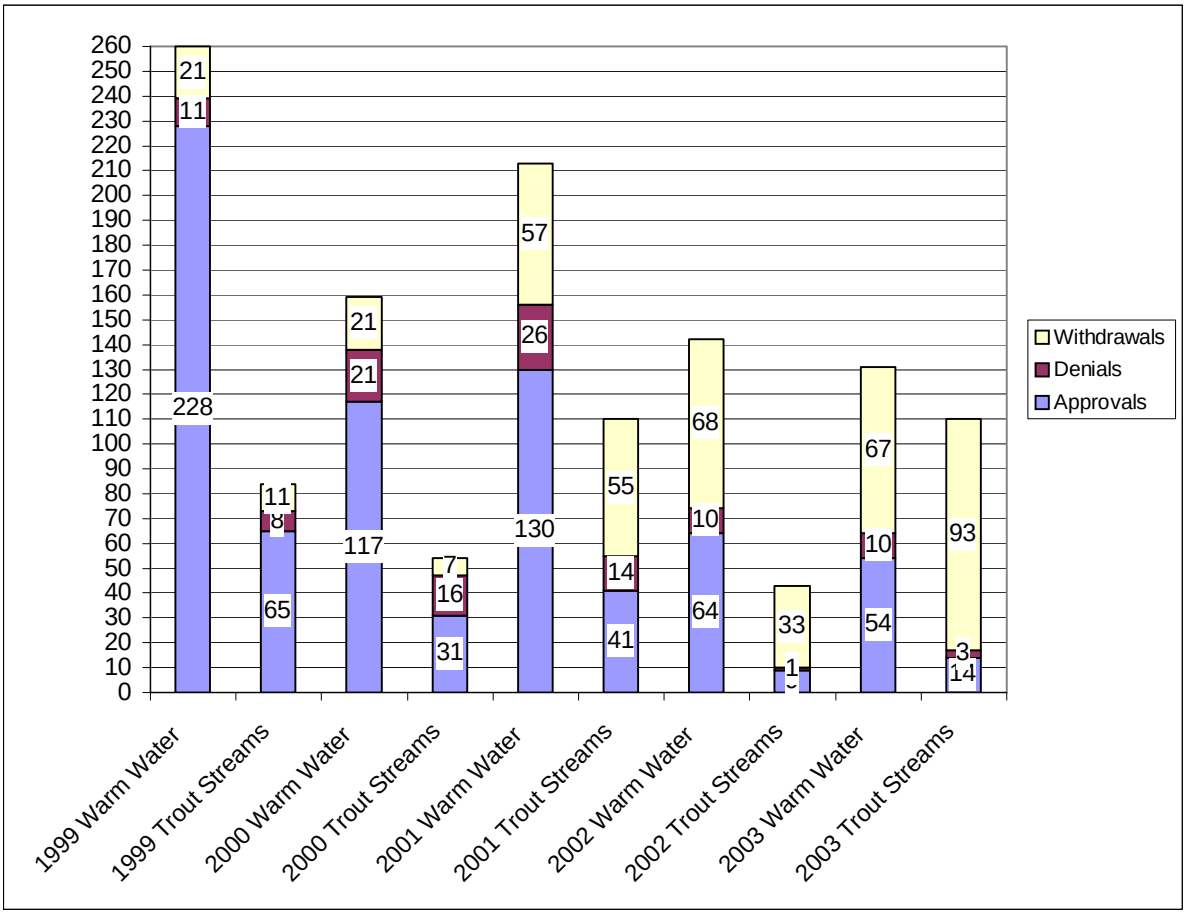
Table 4. Stream buffer variance requests and dispositions statewide, 1999 - 2003

	1999	2000	2001	2002	2003
Requests	344	213	323	185	174
Approvals	293	148	171	73	68
Denials	19	37	40	11	13
Withdrawals	32	28	112	101	93

For the purposes of the Trout Stream Buffer Study, the possible dispositions of a variance request were placed into one of three categories: approvals, denials or withdrawals. Approvals include buffer variance requests that were approved as submitted and those approved with conditions. Denials include requests with the following dispositions: formally denied, not approved, friendly denial, request to reconfigure outside of the buffer, ineligible requests, requests that were sent back, and requests made after the fact (buffer intrusion had already occurred). Withdrawals include buffer variance requests with the following dispositions: application was withdrawn, activity is exempt from buffer requirement, a variance is not needed, an incomplete application package was received and requests for additional information went unanswered, requests that remain in review at the time of the study, and dispositions that are unknown.

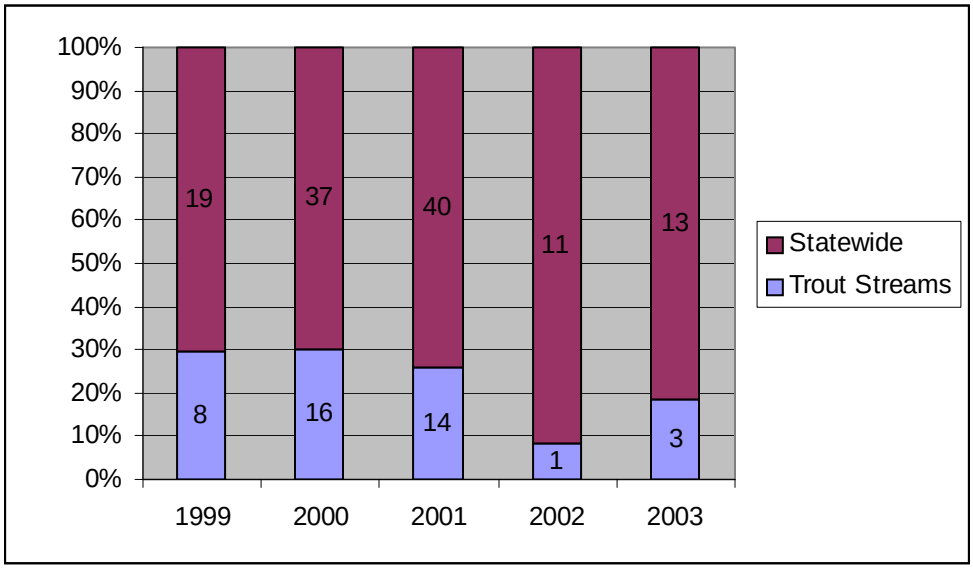
Figure 6 also shows the disposition of buffer variance requests from 1999 to 2003 but breaks the requests/dispositions into those made in the 25 trout stream counties and the remainder 134 counties of the state. (A table of the number of trout stream buffer variance requests and disposition for each of the 25 trout stream counties can be found in Appendix D along with the total miles of trout streams and growth rate by county. The 14 counties in the Trout Stream Buffer Study are indicated in red.) The information in both Table 4 and Figure 6 indicate that the number of variances issued (i.e., approvals) over this time period does not reflect a significantly increasing trend. Further, the trend in the number of variances denied does not indicate widespread denial of requests.

Figure 6. Trout stream and warm water variance requests per year with disposition



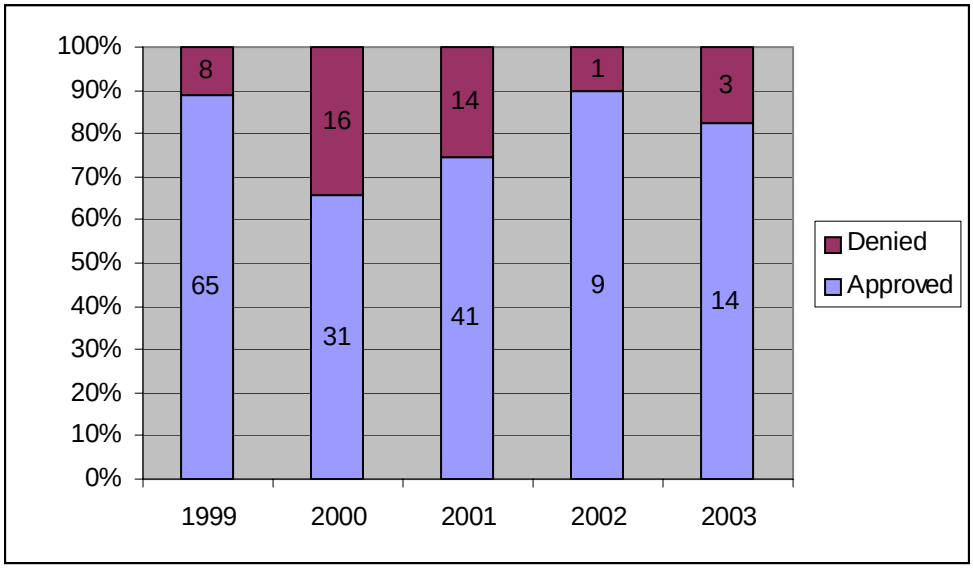
In fact, the percent of denials of trout stream buffer variance requests compared to denials statewide has decreased over the five-year period rather than increased (Figure 7). While approvals of trout stream buffer variances may be more stringent than those for warm waters, trout streams represent a vulnerable resource that merits protection and the steep slopes of the North Georgia mountains tend to be more susceptible to erosion than most areas with warm water streams.

Figure 7. Percent of trout stream buffer variance denials to total denials statewide



In any case, it does not appear to be 'impossible to get a trout stream buffer variance' as seen in Figure 8. The percent of trout stream buffer variance approvals to denials has remained in the 75 percent to 90 percent range for the five year period, with the exception of 2000 when approximately 65 percent of the trout stream buffer variance requests were approved.

Figure 8. Percent of trout stream buffer variance approvals to denials



Interestingly, the information in the above tables and figures seems to indicate that the promulgation of decision criteria in 2000 has impacted the disposition of buffer variance requests as reflected in 2001 – 2003. Table 4 shows that the number of buffer variance requests in the Withdrawal category increased significantly after the decision criteria were instituted in 2001. This may reflect EPD's shift toward a more objective variance application review process

including application information requirements. In addition, Figure 7 shows a decreasing trend in the percent of denials for trout stream buffer variance requests compared to denials statewide, while Figure 8 shows an increasing trend in the variance requests approved. Again, this may represent a more objective decision process including specifications for applications and the use of the decision criteria.

Eight of the ten local issuing authorities in the Trout Stream Buffer Study either believe the variance process is working well or had no comment on the variance process. The following comment focuses on the lack of a general variance for piping small warm waters and expresses the frustration typical of those that believe variances are difficult to gain and may be arbitrarily granted or denied.

> *The only variance typically given by EPD in [this] County are for ponds. We do have one commercial development on a non-trout stream that was granted a variance to pipe several hundred feet of stream; however other similar variance applications on the same stream but smaller tributaries have been rejected. This seems inconsistent and puts the LIA in the awkward position of trying to explain EPD's actions within our jurisdiction. It would help with consistency if non-trout streams had the same general variance as trout streams.*

Another local government offers an idea to reduce some of the confusion and frustration surrounding the variance process by increasing communications. In fact, the comment above also is seeking a means to increase the transparency of variance decisions and better ways to communicate them.

> *EPD should come up with a plan to advise all counties if variances are approved or disapproved, maybe by a statewide fax monthly by county, to each county.*

Trout streams and trout fisheries are vulnerable resources that benefit from strong protection provided by wide undisturbed buffers. An important factor in setting public policy for trout stream buffer widths is effective, impartial and equitable enforcement of the policy. An equally important factor is objective and sound decision-making in granting variances. Since trout stream resources are economically and inherently important, state and local leadership may desire to protect them from loss through the enforcement of buffer requirements and the cautious use of variances.

PIPING OF SPRINGS AND SMALL STREAMS

Some of the confusion and frustration associated with trout stream buffers and buffer variances in the mid to late 1990s was focused on the practicality and rationality of applying a 200-foot protection zone (100-foot buffer on each side) to very small streams and seeps in the ground. Protecting these 'step-over streams' and springheads with the full 100-foot buffer may render a parcel of mountain property undevelopable. Placing buffers around the multitude of headwater seeps and streams could incise the North Georgia region with protection zones, the practicality of which seems daunting. Yet the only effective way to ensure that a stream can continue to support trout is to also protect the small tributaries that drain into the larger, trout-supporting stream from erosion, warm storm water runoff, and excessive nutrient input.[122] Although the health of trout streams is significantly dependent on headwater and upstream conditions, a compromise was established for small springs and streams classified as trout streams that discharge an average annual flow of 25 gpm or less. A recent study concluded that discharges of 25 gallons per minute or less in the Blue Ridge Mountain Province are correlated with intermittent trout streams that drain about 16 acres (the size of the upstream watershed).[123]

Georgia's Policies on the Piping of Springs and Small Streams

In the 2000 amendments to the E & S Act, when the trout stream buffer was reduced to 50 feet, buffers for small springs and streams classified as trout streams were reduced to 25 feet. Landowners also were provided the alternative of piping these same small springs and trout streams under a general variance provided that they submitted a notice of the location and extent; prescribed methodology for minimizing impacts and measuring discharge volume; and stopped short of downstream landowner's property. The amendments required the DNR Board to adopt rules providing for a general variance for piping small springs and trout streams by the end of 2000.[124]

Similar to the buffer variance criteria, the DNR Board promulgated the general variance in its rules and regulations based on guidance provided by the Stream Buffer Variance Criteria Technical Advisory Committee in October 2000. To obtain this general variance, the landowner or applicant for a LDA permit must demonstrate to the issuing authority that the average annual flow of the spring or small stream classified as a trout stream is 25 gpm or less using one of the following acceptable methods: 1) USGS unit area runoff map; 2) averaging three base flow measurements; or 3) via a hydrologic analysis. Coverage to pipe springs and small streams that are classified as trout streams under the general permit is automatically provided with the submittal of the required information and the issuance of the LDA permit. The actual piping of small springs and trout streams under the general variance are subject to the following terms:

- The total length of piped stream on any one property must not exceed 200 feet.
- Projects involving more than 200 feet of piping require an individual variance for the entire project.
- The downstream end of the pipe must terminate at least 25 feet before the property boundary.
- The applicant must notify the appropriate issuing authority of the precise location and extent of the piping in their LDA permit application.

- Controls to reduce flow velocity to predevelopment level, if increased as a result of piping, must be employed and plans for such controls must be submitted with the land-disturbance permit application.[125]

Without long-term flow data gathered for a specific stream, however, it may be difficult to estimate the average annual flow in determining if the small trout stream qualifies for the reduced 25-foot buffer or the piping exemption under the general variance.[126]

Coverage under the general permit for piping springs and small trout streams was replicated in the NPDES general stormwater permit with the 2003 amendments for jurisdictions where there is no local issuing authority and the NPDES general stormwater permit is effective in lieu of a LDA permit. In jurisdictions covered under the statewide NPDES general stormwater permit, landowners who intend to pipe springs and small streams classified as trout streams must notify EPD and provide the information stipulated in the Rules for Erosion and Sedimentation Control providing for a general permit.[127]

Incidence of Spring and Small Stream Piping

Half of the local issuing authorities in the Trout Stream Buffer Study (5 of 10) report being notified of the piping of springs and small trout streams streams by landowners during the three-year time period since the 2000 amendments, 2001 – 2003 (Table 5). Fannin, Rabun, Union, Walker and White counties each report a low incidence of spring and small stream piping of classified trout streams. EPD also reports being notified of a piping incident by a landowner in one (Dawson) of the four counties (Chattooga, Stephens and Towns) in which the agency was the issuing authority. Further, Bartow County reports that pipings are not applicable to its jurisdiction.

Table 5. Piping of springs and small streams

County	2001	2002	2003	Total
Bartow	n/a	n/a	n/a	0
Chattooga	0	0	0	0
Dawson	0	0	1	1
Fannin	-	-	-	5
Gilmer	0	0	0	0
Habersham	0	0	0	0
Lumpkin	0	0	0	0
Pickens	0	0	0	0
Rabun	-	-	-	3
Stephens	0	0	0	0
Towns	0	0	0	0
Union	1	1	1	3
Walker	-	-	-	2
White	1	0	0	1

EPD and all five of the local issuing authorities reporting incidences of pipings state that landowners provided the required notification and information, which are usually filed with the

LDA permit or building permit. One of the five local issuing authorities made the following comment regarding the required information.

> *We were not aware of [the requirement for a control plan to reduce flow to predevelopment level] and have not utilized it in determining a general permit. The first three items [location of piping, extent of piping and flow methodology] are typically in the notifications.*

Clearly some piping of springs and small trout streams is occurring but it is difficult to determine the extent of piping with assurance. Fannin and Union Counties noted that the incidence of pipings reported for them should be interpreted as approximate estimates only, while Fannin, Rabun and Walker counties reported a total for the three years and did not note pipings per year.

Violations of Piping Provisions

Only one of the 14 local issuing authorities in the Trout Stream Buffer Study reported knowledge of a piping violation. And, based on the following comment, that violation appears to have originated from an error made by county personnel rather than from the intent or actions of a landowner.

> *Our previous E&S officer was dismissed and his records were suspect at best. He granted one general variance in error and the Commissioner took on the expense to pay for removing the pipe and reimbursing the landowner for their expense (about $4,000). These people need a variance to be able to utilize their property, but our E&S officer failed to realize it was a state water stream and not a trout stream.*

The following comments, however, may best portray the incidence of piping and piping violations in many North Georgia counties. It is apparent issuing authorities have a sense that piping is a common occurrence, which on the whole remains unregulated.

- *[The] county is so large and mostly rural, typically when someone pipes a creek or stream we do not know about it unless someone complains, which is not very often.*
- *[There are] no known violations [original emphasis].*
- *We have had no reported violations, but there is no way to determine how many streams were piped without our knowledge.*

Six of the 10 local issuing authorities provided no comment on how the general permit for the piping of springs and small streams classified as trout streams is working in their jurisdiction. Or since they had no experience with piping, believed the topic was not applicable. The following comments express a broad range of issues and probably accurately represent the variability of views on piping springs and small streams classified as trout streams.

- *The general permit allows for a more workable approach to the difficult issues encountered with developing in [the] mountain terrain. The county's topography*

mandates such flexibility, both as an aspect of spring-head mitigation in lower elevations and as a realization of the very onerous nature of many potential development sites.

To my knowledge [there are no pipings in the county], but I am sure that it is happening in some circumstances… about piping I can say this: the general variance is too low in number of feet allowed… typically in circumstances where piping is needed, 200 feet is not near enough to solve the problem or alleviate the issue which makes piping necessary to begin with… I would suggest a distance of 500 to 1,000 feet depending on site evaluation and other determinants, sticking with the below 25 gallons volume mark… the important thing to preservation and conservation is that only extremely small volumes can be manipulated (25 gallons), insuring that abuse of such a variance would not be an issue…

- *[It is working] fairly well.*
- *It should apply to all watersheds in our jurisdiction, not just trout streams.*
- *I can't say how it is working because we haven't really had very many. We have not allowed very many to go through on our end; however, I do know that if developers think that it is alright to pipe a creek or stream, they will do so at whatever means is necessary to give them more usable land.*

The applicant for a LDA permit is required to report their intent to pipe springs and small streams that are classified as trout streams to the appropriate issuing authority prior to taking action as a provision of the general permit. Further, local issuing authorities are required to compile this information and submit an annual report of pipings to EPD.[128] During the five-year time period of the Trout Stream Buffer Study, the general permit to pipe springs and small trout streams has been in effect for three years, 2001, 2002 and 2003. EPD, therefore, should have received an annual report from issuing authorities for those three years, but has not. Since many of the issuing authorities in the Trout Stream Buffer Study believe that piping of springs and small streams that are classified as trout streams is occurring and it is apparent that landowners are not reporting pipings to the issuing authorities and local issuing authorities are not reporting the incidence of piping to EPD, implementation of this major provision of the 2000 E & S Act amendments has not been effective.

Procedures to enforce the provisions of a general permit to pipe springs and small streams that are classified as trout streams are the same as for other provisions of the E & S Act (i.e., stop work orders and/or civil penalties). Stop work orders do not appear to be an effective deterrent to violating the piping provisions because most pipings go unnoticed until completed as reported by the issuing authorities in this study. In addition, many of the local issuing authorities in this study believe that piping of springs and small streams that are classified as trout streams is occurring without their knowledge, exclusive of the LDA permit application process. They have no reason, therefore, to inspect for pipings as part of the LDA permit and without knowledge of it cannot pursue civil penalties for violations. Although, adequate record keeping is a specified responsibility of certified local issuing authorities and failure to do so is one of the reasons for de-certification, EPD has not taken action against local issuing authorities that do not report the occurrence of pipings.

FORESTRY EXEMPTION

Under the E & S Act, normal and ongoing forestry practices (cutting, clearing and grubbing) are exempt from the requirement to receive a LDA permit. Forestry practices, however, are subject to the GWQC Act and foresters are required to abide by BMPs. The 2000 amendments to the E & S Act modified the general forestry exemption by excluding disturbance to the stream buffer when the forestry practices are the first step in preparing land for development.[129] Construction can take place on the site after disturbance of a stream buffer only after a three-year waiting period unless the forestry practices were permitted under a stream buffer variance and attached to a LDA permit.[130] This change to the E & S Act attempts to prevent development speculation scenarios in which land (including the stream buffer) is cleared under a forestry exemption and then converted to a construction activity site that provides no buffer protection to waters of the state.

The typical forestry process involves the logger filing a Notice to Harvest Timber with the issuing authority. The issuing authority may conduct a routine inspection; the decision to inspect may be based on local policy and/or on knowledge of the landowner's past development activities and/or compliance record. The findings of the routine inspection may trigger a request to the Georgia Forestry Commission (GFC) for an inspection to determine if typical forestry practices are being conducted or if it looks like a pre-development clearing. If GFC determines it to be a probable pre-development clearing, it advises the issuing authority to investigate the landowner's intent to develop, which may subsequently trigger a local enforcement action.[131]

Although the GFC does not collect forestry exemption data, it has the sense that many forestry exemptions are being used.[132] The EPD also does not collect forestry exemption information either in the jurisdictions in which the agency was the issuing authority or as part of its oversight of certified local issuing authorities. EPD considers forestry exemptions to be a self-implementing provision of the E & S Act.[133] Only one local issuing authority out the 10 in this study reported a single violation of the forestry exemption. Yet, several provided the following comments for improving the E & S program related to the forestry exemption.

- *[There should be s]ome type of regulation like Forestry, if agriculture is claimed, there should be a waiting period before it can be developed.*
- *Make the agriculture exemption same as forestry limiting them to 3 years before S/D [sub-dividing] property after clearing and grubbing.*

Since the E & S Act Amendments of 2000 did not specify an entity that is required to collect information on forestry exemptions, the number of forestry exemptions being used and, more importantly, being abused is unknown. The issuing authorities retain on file the number of notices to harvest that are submitted. Yet this number does not necessarily reflect the number of forestry exemptions being taken because the site may or may not involve state waters and if present, the harvesting may not intrude on the stream buffer. The only way to determine if this exemption is being taken and/or being violated is through local inspections that may be a routine courtesy, fortuitously driven by a citizen complaint or in response to a buffer variance application. Even site inspections conducted within the three-year waiting period are not dependable for making a violation determination due to the variability of sites, the pre-existing

vegetative community and the grow-back rate of the vegetation present at the time the inspection is made.[134] Since closing the loophole that allowed abuse of the forestry exemption and violation of buffer requirements was deemed important in the 2000 amendments to the E & S Act, creating some type of reporting tool is critical to determining the effectiveness of this provision and ensuring another measure for protecting water quality.

ENFORCEMENT

Implementation of erosion and sedimentation program can be viewed as a two-tiered process. One tier is related to processing applications for LDA permits and issuing or denying permits as appropriate (and variances, if applicable). The second tier involves actually enforcing the permit provisions including BMPs, buffer protection and mitigation measures as defined in an approved variance. The effectiveness of enforcement is dependent on several factors: the frequency of site inspections; the number and qualification of enforcement personnel; the clarity and efficiency in the roles and responsibility for enforcement; and the variety and strength of the mechanisms legally available as recourse for violations.

BMPs are required for all LDAs and failure to properly design, install or maintain them constitutes a violation of the LDA permit or the NPDES general stormwater permit for each day on which the failure occurs. These BMPs are design specifications contained in the *Manual for Erosion and Sediment Control in Georgia* published by the Georgia Soil and Water Conservation Commission (GSWCC) for LDAs and specified in *Georgia's Best Management Practices for Forestry* published by the GFC for silviculture activities. BMP failures are measured as discharge of stormwater runoff from disturbed areas that result in the increase of the turbidity of receiving waters. The statute prohibits an increase of more than 25 nephelometric turbidity units (a measure of water clarity) for waters supporting warm water fisheries or more then ten nephelometric turbidity units for waters classified as trout waters.[135]

Inspection Frequency

Adequate field inspections of LDA sites are critical for determining the competence of BMPs, assessing violations of turbidity standards, confirming buffer protection and ensuring compliance with other erosion and sediment control program provisions. Inspections are the responsibility of the local issuing authority for LDA permits and EPD for NPDES general stormwater permits. It is currently recommended that LDA permitted sites be inspected once a week and after every significant rainfall event comprising both scheduled and random inspections. The actual frequency may be established in the local ordinances or policies.[136] The Department of Audits and Accounts found that EPD's enforcement manual specifies on-site inspections at the beginning and end of each LDA project, although only 46 project sites (39 percent) of the 117 LDA permits issued by EPD in fiscal year 2001 had been inspected.[137]

The 14 counties in the Trout Stream Buffer Study demonstrate a spectrum of inspection frequencies as shown in Table 6. Bartow County reported the highest number of inspections. However, it is one of the more metropolitan counties in the study and the county reported these numbers as "the total number of erosion and sedimentation complaints responded to per year by code enforcement officers." The inspection frequency reported by Gilmer and Habersham counties represents the "number of inspections per inspector." Union County reported an "estimated five to fifteen inspections of permitted and complaint sites per month." EPD reported estimates for Chattooga, Dawson and Towns counties and zero inspections in Stephens County because there are "no erosion and sedimentation inspectors in EPD's Northeast District" where the county is located.

Table 6. LDA permit inspection frequency

County	1999	2000	2001	2002	2003
Bartow	1915	2265	3180	4356	5211
Chattooga	---------- Monthly per site ----------				
Dawson	---------- Monthly per site ----------				
Fannin	----- Reactive upon complaints -----			----- Twice monthly per site -----	
Gilmer	66	65	65	65	90
Habersham	124	95	145	195	165
Lumpkin	----- Unknown -----		---------- Weekly per site, minimum ----------		
Pickens	---------- Reactive upon complaints ----------				
Rabun	---------- Twice monthly per site; more frequent if problems arise ----------				
Stephens	0	0	0	0	0
Towns	---------- Monthly per site ----------				
Union	120	120	120	120	120
Walker	---------- Unknown ----------			----- Twice monthly per site -----	
White	Unknown.	---------- At least 3 times per week ----------			

It is difficult to compare the frequency of inspections among the counties in this study or to make meaningful evaluations of the adequacy of the inspection component of erosion and sediment control programs with the highly variable frequency rates reported. The importance of access to enough qualified inspectors to conduct scheduled and random field inspections and to respond to complaints cannot be understated. Regardless of the inspection frequency schedule contained in any local ordinance or policy, personnel resources may be the most significant determinant of local erosion and sediment control program enforcement.

Enforcement Personnel

Enforcement personnel represent the critical resources necessary to implement an effective erosion and sedimentation control program. Employment and retention of qualified personnel to implement and enforce LDA permits has been a long-standing weakness of the E & S Act.

The 1994 amendments to the E & S Act required local governments to employ qualified personnel but this requirement only applied to new requests for certification as a local issuing authority.[138] The vast majority of local governments were certified prior to 1994 and not subject to the requirement for qualified personnel.[139] The issue of qualified personnel has been compounded by the absence of annual checks to ensure that qualified personnel remain in the position. Verification of the presence of qualified personnel only occurs in periodic District reviews.[140] Even when local governments invest in training personnel to meet qualifications, it is not uncommon for trained staff to be lost to changes in employment. Local issuing authorities are not required to notify EPD should the qualified personnel terminate employment and certification status has not been affected by the absence of trained staff.[141]

In the 2003 amendments to the E & S Act, the issue of qualified personnel was addressed by requiring all persons involved in land development design, review, permitting, construction, monitoring, or inspections or any LDA after December 31, 2006, to meet education and training certification requirements and to take at least four hours of continuing education courses every

three years to maintain certification.[142] In addition, the 2003 amendments required the DNR Board to establish certification/decertification requirements in Rules, which state that the local issuing authority must ensure inspection personnel are qualified in erosion and sedimentation control within six months of the date of hire.[143]

At the state level, the Department of Audits found that, "The ability of EPD to fully implement the E & S control program and enforce the provisions of the general permit with its current staff is questionable." In 2001, when this statement was made, EPD had 15 positions and the GSWCC had 12 positions (including regional staff with both agencies) dedicated to statewide implementation of the E & S Act.[144] The staffing inadequacies noted by the Department of Audits are echoed in the following statement made by one of the counties in the Trout Stream Buffer Study.

… The EPD does not possess qualified personnel to enforce the law.

Table 7 shows the number of erosion and sediment control inspectors for the counties in the Trout Stream Buffer Study. Chattooga, Dawson, and Towns counties have approximately 1/3 of an inspector each as eight inspectors work the entire EPD Mountain District comprised of 28 counties. In addition, Pickens County reported a total of 3, 4, 4, 6, and 7 inspectors per year for the five-year period, which includes building inspectors and one land development control officer that is noted in Table 7 as one inspector. Again, Stephens County has zero inspectors because EPD's Northeast District has no erosion and sedimentation inspectors. Further, Union County reported approximate estimates, however, it is likely that other counties also reported estimates.

Table 7. Erosion and sediment control inspectors by county.

County	1999	2000	2001	2002	2003
Bartow	1	2	2	3	3
Chattooga	0.29	0.29	0.29	0.29	0.29
Dawson	0.29	0.29	0.29	0.29	0.29
Fannin	1	1	2	2	3
Gilmer	3	3	3	3	3
Habersham	1	1	1	2	2
Lumpkin	0	0	1	1	1
Pickens	1	1	1	1	1
Rabun	2	2	2	2	2
Stephens	0	0	0	0	0
Towns	0.29	0.29	0.29	0.29	0.29
Union	1	1	1	1	1
Walker	1	1	1	1	1
White	2	2.5	2.5	2.5	2.5

Since many of the numbers of erosion and sediment control inspectors reported in Table 7 are based on estimates, there are concerns with the reliability of the data to accurately reflect conditions in the field. However, nearly all counties report at least one inspector dedicated to enforcement. It is too early to determine if the employment and training requirements stipulated by the 2003 amendments and effective in 2006 provide the structure needed to ensure that

qualified inspectors are consistently available for the proper enforcement of the E & S Act and the NPDES general stormwater permit requirements.

Roles and Responsibilities

In addition to the roles of the local issuing authority and EPD in inspections and enforcement, other entities also have a responsibility for administering provisions of the E & S Act. The EPD Program Coordination Branch includes 4 District Offices. The Mountain District comprises all of the state's trout stream counties excluding Stephens County, which is in the Northeast District. The Districts are responsible for performing compliance and enforcement inspections for a variety of environmental programs including LDAs. They also may respond to citizen complaints, provide technical assistance to local governments and follow-up on the enforcement of compliance provisions.[145]

The GSWCC is comprised of professional staff overseen by a gubernatorially appointed commission. It has six regional offices and 40 districts statewide, comprised of appointed volunteer representatives and supervisors. Region I covers 25 counties and six districts; its office is located in Rome, Floyd County. Its geographic scope includes 20 of the 25 trout stream counties; the remaining five trout stream counties are in the Region II, which covers eight districts and has its office in Athens-Clarke County. Neither the GSWCC nor the districts have regulatory or enforcement responsibilities. They are primarily focused on providing technical assistance, education, and training programs for the implementation of BMPs.[146]

The GFC provides technical assistance, education and training for the required implementation of BMPs during forestry practices. It is organized by districts and has representatives in every county. The 25 trout stream counties are contained within three GFC Districts. GFC's local water quality foresters respond to complaints and work with the site operator to improve the land-disturbing practices, but GFC has no regulatory or enforcement authority.

Like the enforcement mechanisms, the responsibilities of these entities have changed through the amendment process as roles have shifted and become refined. The 1980 amendments to the E & S Act authorized the Georgia Soil and Water Conservation Districts or Commission to review the administration and enforcement of local programs and report poor performance to EPD, which would notify the local issuing authority within 30 days and perhaps revoke certification, if performance did not improve.[147] In 1985, the district's or GSWCC's authority to review the administration and enforcement of local programs was removed and provided to EPD. The districts and the GSWCC shifted to a non-regulatory role with the authority only to provide technical assistance to local governments to improve programs.[148]

The investigation of violations of the LDA permit provisions demonstrates the typical roles each of the entities currently play in implementing the E & S Act. A complaint made by a citizen is usually filed with the local issuing authority or the local government as the first stop for recourse. If the local issuing authority is not able to rectify the complaint or if the local government is not the issuing authority, the complaint is referred to the EPD District Office. The District Office investigates and validates the complaint and works with the permittee/alleged

violator and the local government to resolve the issue voluntarily. Unresolved violations are communicated to the GSWCC, which refers it to the appropriate EPD Regional Office for an attempted resolution. The EPD Regional Office is likely to conduct field investigations also, document the violation and recommend action to the Erosion and Sedimentation Unit of EPD. If deemed appropriate, the Erosion and Sedimentation Unit may take enforcement action (sometimes involving the EPD Director), which is usually referred back to the EPD Regional Office for implementation.[149]

The following comments provide some insight into the perspective of local issuing authorities in the Trout Stream Buffer Study on the effectiveness of these roles and responsibilities.

- *A better more comprehensive understanding of what each participant's role is in the overall E & S Program [is needed to improve the program].*
- *[We need] more enforcement at the State level. It seems that E & S program is working at the local level in [this] County.*

Enforcement Mechanisms

If a violation of erosion and sediment provisions is detected based on field inspections, the issuing authority can revoke the LDA permit or enforcement actions can be initiated in an order of severity to gain recourse. Mechanisms to enforce provisions of erosion and sedimentation control programs can include administrative oversight, legal tools and fines.

Typically, a Notice to Comply is sent to the permittee as the first enforcement recourse after a violation is detected. This letter describes the violation and provides details of the conservation measures necessary to achieve compliance. Assuming the violation is not corrected the next step usually is a Letter of Intent. This action notifies the permittee of the issuing authority's intent to use one or more of the legal mechanisms available to ensure compliance. With continued violation, EPD will issue a Consent Order, which involves negotiated terms of a time schedule and/or fines to bring the site into compliance. An EPD issued Administrative Order is the most severe recourse involving a non-negotiated demand for fines, corrective actions and compliance schedule.[150] This process does not include the use of a Stop Work Order, which can be issued at any time depending on the severity of the violation and the perceived threat to human health and the environment.

Similar to the buffer provisions, enforcement mechanisms have changed through the numerous amendments to the E & S Act. Some enforcement provisions have resembled a tennis match throughout the various amendments. This type of continued alteration reflects a pronounced discord on the state's erosion and sedimentation policies and on the effectiveness of the E & S Act in ensuring the actual enforcement of its provisions.

In the original E & S Act of 1975, enforcement was addressed only in one provision, which allowed the local issuing authority to suspend, revoke or modify the LDA permit for noncompliance.[151] In the 1980 amendments, enforcement in jurisdictions without a certified local issuing authority was addressed for the first time. At that point the EPD Director was authorized

to issue orders for corrective action, seek injunctions for violations and issue an emergency order to stop LDAs for up to 48 hours in cases of imminent and substantial danger to the environment or people.[152]

The 1989 amendments allowed the EPD Director to take enforcement actions within certified jurisdictions also if such an action was determined to be in the public interest.[153] This authority was diminished in 1994 when EPD only could take actions within the jurisdiction of a local issuing authority if requested to do so by the local issuing authority when it had exhausted all local remedies.[154] In 1995, the requirement to request EPD enforcement in certified jurisdictions via a letter was reversed and the EPD Director again was authorized to take enforcement actions, if it was deemed in the public interest.[155]

Both issuing authorities (local or EPD) were authorized to issue stop work orders and require site mitigation in the 1994 amendments.[156] In 2000, the authority of the EPD Director to issue stop work orders was changed through the specification of certain procedures. Except for actions resulting in imminent threat, a written warning allowing five days for corrective action must be issued for first and second violations. If not corrected, the EPD Director then must issue a stop work order until the violation is corrected.[157] The stop work order provisions were tightened again in 2003 by requiring local issuing authorities or the EPD Director for jurisdictions with no local issuing authority to issue an immediate stop work order for certain violations (i.e., undertaking LDAs without a permit, failure to maintain stream buffers and significant sediment discharges) until remedied.[158]

A maximum civil penalty of $1,000 per day was established in the 1980 amendments along with stipulating the mitigation factors that can be used in penalty calculations.[159] The maximum civil penalty was increased to $2,000 per day in 1989[160] and $2,500 per day in 1994.[161] To increase the effectiveness of this enforcement tool, a minimum civil penalty was established in the 2000 amendments at $1000.00 per day for each violation or $250.00 per day for each violation involving a single-family residence.[162] The minimum penalty provision, however, was removed in the 2003 amendments.[163]

In 1989, issuing authorities were required to review the applicant's past performance in determining permit issuance and were authorized to require a bond up to $3,000 per acre, if the applicant had two or more violations within the previous three years.[164] The requirement to consider an applicant's performance history was removed in 1994, but issuing authorities continued to be allowed to deny applicants with two or more violations within the previous three years and retained the authority to require a bond of up to $3,000 per acre for LDA permits.[165]

Like the spectrum of inspection frequencies seen in Table 6, the 10 local issuing authorities in the Trout Stream Buffer Study reported a variety of enforcement approaches (Table 8). And, like the data reported on inspection frequencies, it is impossible to compare and difficult to interpret such wildly different enforcement approaches other than to note that enforcement appears to be occurring. Two counties did not report on the number and type of enforcement actions and there seems to be some artifacts of questionable record keeping in several responses. In addition, the data do not appear to be reliable in every instance. For example, if the number of LDA permits issued (Table 3) is compared with the number of enforcement actions in

Habersham and Rabun counties, nearly every LDA permit results in an enforcement action, which is probably not the case.

Table 8. Number and type of enforcement actions

County	1999	2000	2001	2002	2003	
Bartow	No info	$7,325	$2,525	$12,750	$22,850	Amount collected in fines.
				32		Citations issued to appear in court.
Fannin	Water Quality Notice of Violations; if not corrected, it can be taken to court.					
Gilmer	51	62	42	44	39	Stop work orders.
	10	12	6	8	4	Citations issued to appear in court.
Habersham	35	27	32	44	37	Enforcement actions.
						Mostly Stop Work Orders for buffer violations
Lumpkin *	Unknown	Unknown	Unknown	250-350	250-350	With corrective instructions.
Pickens	Unknown	Unknown	1	3	1	Stop work orders with a fine in 2003.
Rabun	9	16	12	12	15	Letters, notices to comply, stop work orders.
Union *	10 warnings (8 on trout streams), 10 fines.					
Walker	Unknown	Unknown	Unknown	No info	No info	From 2002, very few problems on trout streams.
White	N/A	N/A	N/A	N/A	N/A	

* Approximate estimates.

** The four counties for which EPD was the issuing authority are not included.

Another source of data on enforcement actions are the consent orders executed by EPD.[166] The information in Table 9 does not reflect the less severe enforcement actions that are undertaken prior to consent orders or the most severe action in the form of administrative orders. However, the information provides a basis of comparison and, as importantly, shows a nuance of erosion and sediment control enforcement. As mentioned in the Introduction, trout streams are protected under the E & S Act and the GWQC Act. The information in Table 9 distinguishes between those consent orders executed for violations of each of these Acts.

Table 9. Consent orders executed by EPD in the Trout Stream Buffer Study counties

	1999	2000	2001	2002	2003	Total Fines	Total COs	Total ES Violations	Total WQ Violations
Bartow							2		
ES	0	0	0	0	1			1	
WQ	0	1	0	0	0				1
Fines		$1,000			$7,500	$8,500			
Chattooga							7		
ES	2	0	1	2	1			6	
WQ	0	0	0	0	1				1
Fines	$3,750		$1,500	$2,000	$5,500	$12,750			
Dawson							8		
ES	0	0	2	3	2			7	
WQ	0	0	0	0	1				1
Fines			$7,750	$4,000	$5,750	$17,500			
Fannin							1		
ES	0	0	0	0	0			0	
WQ	0	0	0	0	1				1

Fines					$9,750	$9,750			
Gilmer							5		
ES	0	0	0	0	0			0	
WQ	0	0	2	0	3				5
Fines			$5,000		$7,500	$12,500			
Habersham							2		
ES	0	0	1	0	0			1	
WQ	0	0	0	1	0				1
Fines			$1,000	$10,000		$11,000			
Lumpkin							2		
ES	0	0	0	0	0			0	
WQ	2	0	0	0	0				2
Fines	$1,750					$1,750			
Pickens							11		
ES	0	0	0	0	0			0	
WQ	0	0	1	0	10				11
Fines			$1,500		$27,750	$29,250			
Rabun							10		
ES	0	1	2	4	0			7	
WQ	2	1	0	0	0				3
Fines	$0	$2,500	$1,000	$4,250		$7,750			
Stephens							0		
ES	0	0	0	0	0			0	
WQ	0	0	0	0	0				0
Fines						$0			
Towns							13		
ES	3	0	0	8	1			12	
WQ	0	0	0	0	1				1
Fines	$1,850			$6,000	$3,750	$11,600			
Union							4		
ES	1	0	3	0	0			4	
WQ	0	0	0	0	0				0
Fines	$500		$4,000			$4,500			
Walker							2		
ES	0	0	0	0	1			1	
WQ	0	0	1	0	0				1
Fines			$0		$0	$0			
White							2		
ES	0	0	0	0	0			0	
WQ	0	0	0	0	2				2
Fines					$1,250	$1,250			
Total COs	10	4	16	26	45		69	39	30
Total Fines	$7,850	$6,000	$32,750	$61,048	$165,250	$272,898			

Note: Cos – Consent Orders; ES – Erosion and Sedimentation; WQ – Water Quality.
Source: Georgia Department of Natural Resources, Environmental Protection Division

It is apparent that enforcement of water quality standards in the Trout Stream Buffer Study counties occurs under the E & S Act and the GWQC Act equally. It is also apparent from

Table 9 that EPD executed consent orders compliment the enforcement efforts of local issuing authorities and the mechanisms used at the local level to achieve water quality standards. In addition, Table 9 indicates an increased enforcement effort over the five-year time period through both the number of consent orders issued and the amount of fines levied. Consent orders are a fairly severe type of enforcement action, usually issued after local recourses have been exhausted. The increased used of consent orders carrying a sizeable financial encumbrance for permittees may prove to be an effective tool to ensure compliance with water quality standards. The following comment made by a Trout Stream Buffer Study county shows just how important this tool can be at the local level.

- *We need [state] SUPPORT!!! We have issued stop work orders only to have them over turned the next day. A consent order has been issued for one site with the most problems that directly impacts state waters. The consent order was issued and has never been enforced. We need more enforcement from the EPD and locally in what we are trying to accomplish.*

When the state entered into the NPDES general stormwater permit program in 2003, the regulatory burden for the E & S Act devolved to the local level more explicitly. The 2003 amendments to the E & S Act require the local issuing authority to inspect and enforce its permits. The 2003 amendments also authorize local issuing authorities to take enforcement actions against many previously exempted projects and/or parties. In addition, the 2003 amendments place regulatory compliance responsibility on the site operator instead of the property owner reflecting the shift to primary/secondary permits in an attempt to affect the behavior of onsite personnel.[167]

The relatively low civil penalties established by the E & S Act have proved ineffective in deterring violations in the past as the cost of fines were often lower than the cost of installing compliance measures. In contrast, the general stormwater permittee is subject to a civil penalty of up to $50,000 for each day of failure to properly design, install, or maintain the BMPs or violation of any other provision. The penalty increases to $100,000 per day for another separate violation occurring within 12 months of the first incident.[168] In addition, there is no bond requirement for applicants covered under the statewide NPDES general stormwater permit but EPD can conduct site inspections to determine compliance with the terms of the permit.[169]

The importance of enforcement cannot be over emphasized. Erosion and sedimentation control in Georgia is only as good as a clear enforcement provisions (roles, responsibilities, consequences, data gathering and reporting requirements) that are adequately funded and implemented by trained personnel.

> *I firmly believe if the basic E & S Act passed in 1975 were strictly enforced, all these other E & S amendments enacted recently would be unnecessary, be less confusing and we would have a much better program than we have now.*

As seen from the comment, enforcement of existing provisions is more important than additional legislation for accomplishing basic program goals.

CONCLUSION

Protecting trout stream resources under the Georgia Water Quality Control Act and the Georgia Erosion and Sedimentation Act has been beset with issues since protection measures were initiated in the mid-1960s. The link between what happens on land and the subsequent affect on water quality and aquatic resources is direct and difficult to administer because it necessarily involves regulating land-disturbing practices. The Legislative Advisory Committee on Trout Stream Buffers recommended compromises on many of the issues it was asked to consider for improving the state's erosion and sedimentation laws, regulations and programs. This report examined the policy implications resulting from the 2000 amendments to the E & S Act including local issuing authority, the effectiveness of the buffer variance process, the occurrence of spring and small stream piping of classified trout streams, the use of silviculture exemptions and the incidence of enforcement actions. In conducting this assessment, issues related to the availability and reliability of data and information on erosion and sediment control became apparent.

Policy Implications

The devolution of authority to govern land-disturbing activities under the E & S Act is one example of the state's attempt to respect the authority of local governments to regulate local land practices. Chronic shortages of funds and trained personnel at the local level have made it difficult to appreciate gains in erosion control and water quality. Considering the difficulties inherent in regulating land practices associated to the increasing devolution of responsibility and liability, it is surprising that all the local governments in this study are interested in retaining local issuing authority and remaining responsible for local erosion control programs. Although there is a great deal of merit in local responsibility for land-disturbing activities (i.e., control of the rate and quality of development, greater responsiveness to the concerns and desires of the community, increased access to the field), the 2003 amendments to the E & S Act and the GWQC Act may place increased liability on local governments. Each local government, therefore, would be prudent to weigh the benefits and risks of retaining responsibility of land-disturbing activities as a local issuing authority.

In the 2000 amendments to the E & S Act, trout stream buffers were reduced in width from 100 feet to 50 feet. A 50-foot wide buffer is within the recommended range for some buffer functions under some site conditions.[170] The reduction in protection benefits resulting from narrower buffers may be offset by the formalization of the buffer variance process, in particular with the creation of buffer variance decision criteria that makes it harder to get a variance. Yet, the buffer variance process seems to have been rather stable over the five-year time period of this study, 1999 – 2003, with no significant increases in the number of requests or the number of denials. It is difficult to connect increased protection benefits with the new buffer variance process, although it does appear to have benefited from the transparency and objectivity provided by the criteria and by more rigorous application protocols.

An increase in the severity and incidence of enforcement actions is another way to offset reduced protection provided by narrower buffers. The 2000 amendments to the E & S Act established a minimum fine and made it easier to issue violators stop work orders. The minimum

fine was revoked in a later amendment, however, and an evaluation of enforcement actions in the Trout Stream Buffer Study counties did not indicate that the use or effectiveness of stop work orders had increased after 2000. Although stop work orders are probably the strongest incentive available to achieve compliance due to lost opportunities costs in having work stopped, additional personnel should be assigned to enforce trout stream requirements.

The piping of springs and small streams that are classified trout streams could have significant impact on water quality and trout resources if the practice is widely used. Although there are reporting requirements, the practice of piping is provided under a general permit, which by its nature minimizes involvement of any regulatory entity. Most issuing authorities in the Trout Stream Buffer Study believe that piping is a common practice, but have no real information on its occurrence. The same situation is true of the silviculture exemption. There is reason to believe that it is being used and if it is adhered to as designed in the 2000 amendments, protection of water quality and trout resources can be expected. The silviculture exemption, however, has no reporting requirements making it impossible to determine occurrence or effectiveness.

The recent shift toward self-reporting provisions in the law and/or the complete absence of legislatively stipulated reporting requirements may ease the burden of administrative oversight at the cost of reducing the effectiveness of erosion and sedimentation control in Georgia. For instance, the piping of springs and small streams classified as trout streams provided for in the 2000 amendments is a generally self-administered provision under a general permit dependent on the principles of the landowner/developer to act in good faith even though there is an inherent conflict of interest to do so. In aligning the E & S Act with the NPDES general stormwater permit, the same type of self-administered provisions are now in place for erosion and sediment control in areas of the state where there is no local issuing authority. Considering that the incidence of piping and piping violations cannot be determined from the structure and administration of a self-administered general permit, it will be prudent to closely monitor how erosion and sediment control works under the self-administered NPDES general stormwater permit. The piping provision may merit restructuring to allow for regulation by a designated entity, perhaps under an individual permit. As well, the forestry exemption may benefit from a requirement to report its use to an identified entity that collects the data.

The permit fee system, instituted in the 2003 amendments linking the E & S Act with the NPDES general stormwater permit, was conceived as a means for addressing budget shortages at the state and local levels that have produced chronically under-staffed state and local erosion and sedimentation programs. The permit fee was negotiated in return for relief from the previously required monitoring under the E & S Act with the idea of using it to hire enforcement personnel.[171]

EPD's portion of the fee (one-half of the $80.00 per acre of disturbed land in jurisdictions with a local issuing authority and the full amount in all other jurisdictions) is placed in the general fund and is subject to the uncertainty of the state's appropriations process in any specific year. Given that uncertainty, perhaps in locations with a certified local issuing authority the fee amount ought to be paid in full to the local government. There does not seem to be any clearly articulated services the EPD plans to provide in these jurisdictions creating the perception that

this portion of the fee resembles a tax. Further, paying the full amount to local governments for local enforcement may be the best means of ensuring on-the-ground administration of the law as the following comment indicates.

> *That EPD would institute new fees for development, modify its regulating approach from one emphasizing water testing to one with emphasis on good site planning and operator qualification, and restructure its permitting process through the lens of the lowest common denominator is not only appropriate to actual development circumstances, but also much more realistic from the perspective of regulatory oversight on a local government level. By stressing qualifications and planning for those in the grading business, EPD is assisting and expediting the maturation of Georgia's construction industry, most particularly in those areas that are predominately rural. There is little question as to whether the amended Soil and Sedimentation Act, or the rules and regulations thereby promulgated, will improve site conditions, better protect the environment, and alleviate what many within the industry recognized as serious compliance impediments – unrealistic turbidity measurements, vague and ambiguous measurements for site (ergo operator and BMP) performance, and the lack of professional development planning. Especially in rural areas, EPD's efforts will coincide with local initiatives for better long-term development planning and regulatory expansion.*

Data and Information

The assessment of data and information issues was not part of the scope of the Trout Stream Buffer Study but the issues were so common and widespread as to affect the completion of the study's objectives and, therefore, merit discussion. Data and information are a required foundation for the ability to conduct policy analysis or program evaluation. As part of the 2001 performance audit, the Department of Audits concluded that the data necessary to determine if the State Erosion and Sedimentation Control Program is "achieving its overall purpose of protecting the state's land and water resources" is not maintained. In addition, the baseline water quality data necessary "to measure the Program's impact on the amount of sediment in the rivers and streams" is not available and "as a result, there is no way to determine if the state's waters are improving as a result of the Erosion and Sedimentation Control Program." To rectify this situation, the Department of Audits recommended that specific goals and objectives for evaluating the effectiveness of the Program be established.[172]

Likewise, there is a dearth of data and information on local erosion and sedimentation programs. Nearly every issuing authority in the Trout Stream Buffer Study reported difficulty in gathering the data requested in the survey. Some of the issuing authorities indicated that they did not track information on the number of LDA permits issued, those that were issued for development on trout streams, the number of inspectors, the rate of inspection frequency or the number of claimed forestry exemptions. Several issuing authorities reported that they did not have a data collection protocol in place. Frequently, it was impossible to replicate complete data sets for the five-year period.

In addition to issues with gathering and reporting the complete data sets necessary to analyze trends, all issuing authorities (local and state) reported a lack of confidence in the reliability of the data that were available. Several issuing authorities reported that information submitted by previous personnel is suspect in its accuracy. In general, these issues seem to be related to the absence of data protocols or criteria that would create consistency in data collection and reporting even when multiple personnel are involved.

These data reliability concerns have been noted in the applicable sections of this report. They were reported with even the simplest task of tracking the number of LDA permits issued per year. As noted, changes in the authority to issue LDA permits from local to state and changes in staff at the local level have resulted in suspect record keeping and non-existent LDA permit issuance records. Because baseline data on the number of LDA permits issued per year is inconsistent or incomplete and issuing authorities do not track the number of LDA permits issued on trout streams, the level of development pressure on trout stream resources and the impact on those resources cannot be determined reliably.

Unfortunately, the same scenario is occurring with the piping of springs and small streams that are classified as trout streams and with forestry exemptions. In addition to concerns with data reliability related to inconsistent or incomplete data collection, reporting requirements complicate the evaluation of these provisions of the E & S Act. Although landowners are required to report the piping of springs and small streams that are classified as trout streams to the issuing authority and the local issuing authorities are required to report the incidence of piping annually to EPD, neither requirement is currently satisfied. As previously discussed, both local issuing authorities and the state report strong beliefs that pipings are occurring. The inability to determine the incidence of piping and to evaluate its impact on trout stream resources is problematic. Further, there are no reporting requirements for use of the forestry exemption and, as noted in this report, it is not always possible to determine that the site has been clear-cut within the previous three years. In the absence of a reporting requirement, data are not collected and an evaluation of this provision of the 2000 amendments to the E & S Act cannot be undertaken. It remains impossible to determine if the use of the forestry exemptions are continuing as a means of violating erosion and sedimentation requirements and contributing to the degradation of the state's water quality.

Enforcement is another area where there are apparent data issues. Many of the issuing authorities reported estimates of the number of erosion and sediment control inspectors and inspection frequencies making it difficult to compare local enforcement rates or evaluate its effectiveness. In most counties, there is one inspector dedicated to enforcement, which is widely accepted as an under-staffed ratio of personnel to function. Citizen complaints, therefore, become an important means to gain awareness of erosion and sediment control failures. However, the complex flow of enforcement roles and responsibilities appears to further complicate record-keeping and hinder effective enforcement. For example, the Department of Audits found that the GSWCC's "regional offices are only required to document the number of complaints received, the source of the complaints, and the subject of the complaints. They are not required to maintain information for verifying that all of the complaints were actually resolved or were resolved in a timely manner."[173] Clearly, laws and programs are only as good as the degree to which they are meaningfully enforced.

Trout stream buffer protection is a complicated undertaking because protection provisions are based in two state laws (i.e., E & S Act and GWQC Act); because local governments have responsibility in some areas, while the state retains responsibility in other jurisdictions; because the roles and responsibilities are diverse among multiple local, regional, and state entities; and because there has been no effort to document, gather and report the kind of data that supports evaluation of progress. The development of protocols and the dissemination of those protocols in the form of guidance for issuing authorities and for all entities with a role in erosion and sediment control may alleviate issues with standardized record keeping, routine data reporting and consistent program administration. This could provide for a stronger erosion and sedimentation program statewide, increased protection of trout stream resources and greater water quality benefits.

Most local governments encourage development and growth because it strengthens the local economy and builds the tax base for the provision of community services. Yet, there may be an unrealistic expectation for local governments to both seek and regulate development.[174] Some may find it difficult to deny permits and/or enforce provisions that may slow construction or drive developers to a nearby local issuing authority with less rigorous enforcement practices. State support of education and outreach at the local level may be the most significant action that can be taken to inform those involved in LDAs of the laws, rules, procedures and consequences. This need for education and training for those involved in all aspects of LDA permits has begun and the curriculum revised per the 2003 amendments to the E & S Act. Certification under the new training curriculum is required by 2006. Assessment of the impact of this education, therefore, must be made at a later date. To complement this education effort the state might consider supporting local governments in conducting community outreach on water quality issues and erosion and sediment control practices because many mountain residents do not trust the state or the information provided by the state.[175]

Vegetated buffers play an important role in protecting water quality in streams statewide and in trout stream, specifically. Streamside buffers also protect water supplies and reduce the cost of water treatment for public drinking water systems. Sediment fills in streams and reservoirs; clogs water intakes; and carries heavy metals, nutrients and other chemicals that increase the complexity and cost of water treatment. Most public water supplies in North Georgia depend on surface water and the cost of treating water to meet drinking water standards increases dramatically when soil must first be removed before chemical treatment may occur. The protection of buffers on trout streams and warm waters is, therefore, a challenge statewide and not an issue that just affects streamside property owners, local governments, or state agencies.[176]

APPENDIX A
CHRONOLOGY OF TROUT STREAMS, BUFFERS AND EROSION AND SEDIMENTATION LEGISLATION, RULES, REGULATIONS AND STUDIES

1955
State Game and Fish Commission created, members appointed by the Governor, and all laws relating to game and fish are consolidated.[177]

1965
Federal Water Quality Act of 1965 requires states to classify waters according to use and adopt minimum water quality standards for interstate waters. The Act creates the Federal Water Pollution Control Administration (a forerunner of the Environmental Protection Agency).[178]

1967
The Georgia Water Quality Control Board adopts regulations allowing a no temperature change standard for designated trout waters, which was approved by the Federal Water Pollution Control Administration.[179]

1971
Georgia trout waters were officially listed for the first time under the Georgia Water Quality Control Act (O.C.G.A. 12-5-20 et seq.). Questions arise over the validity of the no change in temperature standard because it blocked construction of flood control impoundments in trout stream watersheds.[180]

1975
Georgia Erosion and Sedimentation Act of 1975 (E & S Act) is adopted establishing a statewide program to conserve and protect land, water, air and other resources of the state.[181]

Definition of State Waters
"…any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership or corporation."

Definition of Land-Disturbing Activity
"…any land change which may result in soil erosion from water or wind and the movement of sediments into State water or onto lands within the State, including, but not limited to, clearing, dredging, grading, excavating, transporting and filling of land, other than federal lands…"

Exemptions from Definition of Land-Disturbing Activity and Requirements

- surface mining and granite quarrying;
- home gardens, landscaping, maintenance and repairs;
- construction of single-family homes for occupancy of owner;
- agricultural and forestry practices;
- projects below regulatory threshold;
- projects of the DOT, Georgia Highway Authority, Georgia Tollway Authority, counties and municipalities (public projects exemption); and
- projects of airport authorities and public utilities under the regulatory jurisdiction of the Public Service Commission.

Regulatory Threshold
Act applies to projects of more than 5 acres or projects moving more than 500 cubic yards of land, except those land-disturbing activities within 200 feet of the bank of any major stream or river which drains at least a land area of 100 square miles.

Governance of Land Disturbing Activities
- Local governments are required to adopt ordinances governing land-disturbing activities. Local government requirements may be more stringent. Local governments that have adopted appropriate ordinances/resolutions may become issuing authorities.
- Georgia Board of Natural Resources (Board) is directed to establish rules and regulations for use by the Georgia Environmental Protection Division (EPD) for reviewing permits for land-disturbing activities in jurisdictions that have not adopted a local ordinance;
- Minimum requirements are specified for erosion and sedimentation control rules and regulations, ordinances or resolutions.
- Permits are required from the appropriate issuing authority before commencement of a land-disturbing activity. Permitees are required to have an erosion and sediment control plan approved by a Soil and Water Conservation District (SWCD). Issuing authorities must issue or deny a permit no later than 45 days after receipt of the application.
- SWCDs are directed to review applications and plans and provide recommendations for permit issuance.
- Governing authority can suspend, revoke or modify the permit for noncompliance.

Buffer Requirements
Not addressed.

Variances
Not provided. Individuals can appeal the issuing authority's decision to the appropriate County Superior Court.

Enforcement
Not addressed.

1975
Senate Resolution 142/House Resolution 339 adopted requesting the Department of Natural Resources (DNR) to study the practicality of changing the classification of certain trout streams

and the application of stream temperature regulations on a case-by-case basis to provide for planned impoundments that may have no significant deleterious impact on trout resources.[182]

1976
Trout Stream Study resulting from Senate Resolution 142/House Resolution 339 is released. In studying the state's trout resources, it focused on the existing criteria and procedures for designating trout streams and the water quality standards for temperature and dissolved oxygen designed to protect trout resources.[183]

The current dual classification system for designating primary and secondary trout streams resulted from this study.[184]

Primary/Secondary Trout Streams Defined
Primary trout waters are waters supporting a self-sustaining population of rainbow, brown, or brook trout. Secondary trout waters are those with no evidence of natural trout reproduction, but which are capable of supporting trout throughout the year.[185]

1977
Game and Fish Code, Title 45, was enacted completely revising the state laws relating to game and fish including designating trout streams with and without seasons. Under trout waters with seasons waters and all streams within identified watersheds (by county) were designated as trout waters.[186]

1977
The first trout stream listing under the dual classification system was approved by the Environmental Protection Agency. The listing was developed by trout management personnel, using their knowledge of the resource, historical data, stocking records, and available fish population and temperature data.[187]

1978
Game and Fish Code is amended to exclude impoundments on trout waters as legally designated trout streams.[188]

1979
Game and Fish Code is amended to expand the list of designated trout waters with and without seasons.[189]

1980
A trout stream survey recommends a maximum weekly average temperature of 72 degrees Fahrenheit as a guideline for listing secondary trout waters.[190]

1980
E & S Act amended.[191]

Definition Land-Disturbing Activity
Excluded land-disturbing activities on state land

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Added projects of water and sewage authorities established by the General Assembly to the public projects exemption.
- Added activities of electric membership corporations and municipal electrical systems.

Regulatory Threshold
Projects moving more than 500 cubic yards of land are removed from regulation.

Governance of Land Disturbing Activities
- Authorized SWCDs, upon concurrence of the Georgia Soil and Water Conservation Committee (GSWCC), to delegate responsibility for application and plan reviews to issuing authorities.
- Authorized SWCDs or GSWCC to review the administration and enforcement of local programs, report poor performance to EPD, which notifies the local issuing authority within 30 days, EPD may revoke certification.

Enforcement in Jurisdictions without Issuing Authority
- Authorized EPD Director may issue corrective action orders, seek injunctions of violations or potential violations
- Established a maximum civil penalty of $1,000 per day (each day is a separate violation).
- Included an administrative appeals process.
- Established penalty mitigation factors for use in penalty calculations;
- Authorized the EPD Director to issue an emergency order to stop land-disturbing activities for up to 48 hours in cases of imminent and substantial danger to the environment or people.

1982
Game and Fish Code is amended revising the list of water classified as trout streams.[192] Stream segments are added and deleted to secondary trout waters list based on water temperature and flow data. Stream segments are also upgraded from secondary to primary designation based on fish population sampling. Revisions are approved by the Environmental Protection Agency.[193]

1985
E & S Act amended.[194]

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Amended regulatory threshold exemption to limit the definition of “state waters” (by excluding intermittent streams from the 200 foot buffer requirement); however, sediment must be kept within the property boundaries.

- Required construction and maintenance projects exempted under the public project exemption to use DOT erosion and sedimentation control specifications.

Governance of Land Disturbing Activities
- Removed authority of SWCDs or GSWCC to review the administration and enforcement of local programs.
- Authorized SWCDs and GSWCC to provide technical assistance to local governments to improve programs.
- Authorized EPD to review the administration and enforcement of local programs periodically.

1987
Attorney General's Opinion[195]
Local governments may not regulate activities and projects excluded under the E & S Act.

1989
E & S Act amended.[196]

Definition of Land-Disturbing Activity
Changed to read: "…any activity which may result in soil erosion from water or wind and the movement of sediments into State water or onto lands within the State, including, but not limited to, clearing, dredging, grading, excavating, transporting and filling of land, but not including agricultural practices-…"

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Further conditioned public projects exemption based upon the nature of the state water (intermittent) and the size of the upstream watershed area (greater/less than three square miles). All public projects within 100 feet of trout streams must comply with minimum E & S Act standards.

Regulatory Threshold
Lowered the regulatory threshold to require compliance of projects of more than 1.1 acres.

Governance of Land-Disturbing Activities
- Expanded the minimum requirements.
- Established a sediment standard. Stormwater discharge may not exceed 50 nephelometric turbidity units (NTUs) higher than the receiving stream upstream of discharge. Runoff from roadway drainage structure construction may not exceed 60 NTUs higher than the receiving stream upstream of the site.
- Required issuing authority to review past performance of applicant and authorized them to require a bond up to $3,000 per acre if two or more violations occurred within previous three years.
- Authorized the EPD Director to take enforcement actions within certified jurisdictions, if determined in the public interest.

Buffer Requirements
- Required for first time.
- Prohibited land-disturbing activities within the 100-year floodplain.
- Required undisturbed 25-foot natural vegetative buffer measured from the stream bank required for all state waters except: 1) where otherwise required by the Metropolitan River Protection Act, 2) where otherwise required by DNR under O.C.G.A. §12-2-8, 3) when the economic use and land contours require a different buffer subject to EPD's approval, or 4) where a drainage structure must be constructed.
- Prohibited land-disturbing activities within 100 feet (horizontal) of the banks of trout streams (as designated under the Water Quality Control Act) except for roadway drainage structures.

Variances
- Authorized for first time.
- Authorized EPD Director to grant a variance to the 100-foot trout stream buffer requirement.
- Authorized EPD Director to grant a variance from the sediment standard.

Enforcement
- Increased maximum civil penalty to $2,000 per day (each day is a separate violation).

1990

Attorney General's Opinion[197]

Issuing authorities do not have the authority to approve buffer variances. Buffer variances under the E & S Act must be approved by EPD.

1992

Additional streams are added as secondary trout water based on temperature monitoring. Some streams upgraded from secondary to primary and downgraded from primary to secondary based on fish population sampling.[198]

1993

Senate Resolution 252 created a 17-member Senate Storm-Water Pollution Study Committee to study laws relating to soil erosion and sediment control, and control of storm-water runoff from construction and land disturbing activities. The committee addressed many concerns but did not resolve the instream turbidity standard issue and stood abolished on December 1, 1993 (see 1994).[199]

1993

Attorney General's Opinion[200]

The use of "stream banks" does not limit the application of the 25-foot buffer. The buffer requirements also apply to ponds, lakes, reservoirs, and coastal marshes.

1994
E & S Act amended.[201]

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Removed projects of water and sewage authorities established by the General Assembly and airport authorities from the public projects exemption.

Governance of Land Disturbing Activities
- Increased and amended the sediment standard increased. Stormwater discharge may not exceed 100 NTUs higher than the receiving stream upstream of discharge except for trout streams where the standard is 50 NTUs.
- Authorized the Board to adopt rules setting maximum allowable turbidity level and establishing a method of determining that level based on the results of the Dirt I study. Standards set in rule supercede legislative standards.
- Removed the requirement to consider an applicant's performance history.
- Allowed issuing authorities to deny applicants with two or more violations within previous three years.
- Required permits to be denied if applicant owes past due ad valorem tax.
- Required local issuing authorities to employ qualified personnel to implement ordinances in order to obtain certification.
- Amended authority for EPD Director to take enforcement actions within certified jurisdictions, if determined in the public interest. EPD may only take actions within a local issuing authority if requested to do so via a letter. Local remedies must be exhausted. No jeopardy to certification.

Buffer Requirements
- Removed prohibition of land-disturbing activities within the 100-year floodplain.
- Clarified measurement of 25-foot and 100-foot buffers to be measured from the point where vegetation has been wrested by normal stream flow or waves.

Variances
- Authorized EPD Director to grant a variance from the 25-foot and 100-foot buffer requirement.

Enforcement
- Authorized the local issuing authority or EPD Director (for jurisdictions with no local issuing authority) to issue stop work orders and require site mitigation.
- Increased the maximum civil penalty to $2,500 per day (each day is a separate violation).

1994
Georgia Erosion and Sedimentation Control Panel convened to continue the Senate's Storm-Water Pollution Study Committee 1993 effort by reviewing the current instream sediment standards and making recommendations for an alternative standard, if necessary. The study committee envisioned a two-phase process (Dirt I and II), determination of appropriate turbidity levels followed by determination of practices to meet those levels. The Dirt I panel recommended (1) establishment of an enforceable limit on site discharge effluent, (2)

implementation of a maximum 25 NTU instream standard with allowance for a 10-year rainfall event, (3) additional study on compliance strategies, and (4) increased monitoring and enforcement on nonattainment streams.[202]

1995

E & S Act amended.[203]

Exemptions from Definition of Land-Disturbing Activity and Requirements

- Clarified the single-family residence exemption by imposing a new buffer requirement on trout waters: No land-disturbing activity is allowed within 50 horizontal feet of primary or secondary trout waters. A minimum 25 horizontal foot buffer is required for first order trout waters (those waters fed by no other streams except springs).

Governance of Land Disturbing Activities

- Required best management practices (BMPs) for all land-disturbing activities. BMPs contained in the GSWCC's Manual for Erosion and Sediment Control in Georgia are considered minimum BMPs for land-disturbing activities.
- Provided that proper design, installation and maintenance of BMPs is a complete defense of allegations of noncompliance for a 25-year rainfall event or greater.
- Provided that improper design, installation and maintenance of BMPs shall constitute a permit violation for each day that stormwater discharge results in an instream turbidity standard greater than 25 NTUs for state waters and 10 NTUs for trout stream waters.
- Authorized the EPD Director to require in-stream turbidity monitoring.
- Removed requirement for local issuing authority to request EPD enforcement in certified jurisdictions. EPD Director may enforce if it is in the public interest.

Buffer Requirements

- See exemptions text.

Variances

- Prohibited buffer variances for single family residences on primary trout waters.
- Prohibited buffer variances for single family residences on first order trout waters.
- Authorized EPD Director to grant buffer variance up to 25 horizontal feet for single family residences on secondary trout waters.

1996

The Erosion and Sedimentation Control Technical Committee, known as Dirt 2, undertakes phase two of the Georgia Erosion and Sedimentation Control Panel program. The committee was appointed by the GSWCC and EPD at the request of the Lieutenant Governor. The committee was asked to determine the engineering and other practices required to economically attain the previously set turbidity levels. Dirt 2 developed a set of general recommendations for state and local governments, the Governor and General Assembly, operators and professionals, and the general public.[204]

1997
DNR proposes tighter regulations on the stream buffer variance process in response to discovering that the issuance of variances had become standard operating procedure, an inconsistency with the intent of the E & S Act. The draft regulations were unpopular.[205]

1998
House Bill 1593 included the definition of primary and secondary trout waters, weakened the plan review/approval process, shifted authority to issue buffer variances from the EPD Director to the local issuing authority, required variances to be granted unless the local issuing authority demonstrates "significant degradation", established a 30-day variance action (grant/denial) deadline for trout waters and a 60-day deadline for other waters, and prohibited variance request fees to be charged. The bill passed the House, but died in the Senate Natural Resources Committee.[206]

1998
DNR withdraws the draft regulations and the Legislative Advisory Committee on Trout Stream Buffers is created by joint agreement of the Chairmen of the Senate Natural Resources Committee, House Natural Resource and Environment Committee, and House Game, Fish and Parks Committee and the Commissioner of the Georgia Department of Natural Resources. Ten members, five representing North Georgia stakeholder concerns and five representing environmental concerns were appointed by the three Chairmen. The Advisory Committee was asked to 1) provide recommendations on how to better structure the buffer program, and 2) to determine whether legislative or regulatory changes should be made in Georgia's Erosion and Sedimentation program relating to stream buffers. Selected recommendations of the Advisory Committee are codified in the 2000 amendments to the E & S Act.[207]

1998
Game and Fish Code (O.C.G.A. 27-1-1 et seq.) amended. The list of seasonal and year-round trout streams by county is removed from Georgia Code and the authority to designate stream, lake or watershed as trout waters is delegated to the DNR Board with the authority to promulgate rules and regulations listing trout streams.[208] The DNR Board removes several trout streams from the list based on fisheries biologists' recommendations including temperature data that indicates that the waters are too warm to support trout year-round, lack of return tags from stocked trout over a three-year period and professional judgment.[209] This delisting decision is contentious, due in part, to the lack of a written policy to guide the listing/delisting process. The DNR Board, therefore, created the Advisory Committee on Trout Stream Classification (see 2000).[210]

2000
E & S Act amended.[211]

Definition of Buffers

First time in law: "…the area of land immediately adjacent to the banks of state waters in its natural state of vegetation, which facilitates the protection of water quality and aquatic habitat."

Exemptions from Definition of Land-Disturbing Activity and Requirements
Amended silviculture exemption to preclude any other land-disturbing activities on the entire property for 3 years when forestry practices are conducted in a buffer. This is an attempt prevent bypassing buffer requirements by clear-cutting under forestry exemption then flipping the property for development.

Governance of Land Disturbing Activities
- Amended the minimum requirements for buffer rules and regulations, ordinances or resolutions to prohibit any buffer disturbance until construction site is completed and stabilized. After stabilization, thinning or trimming is allowed as long as buffer is protective of water quality and canopy provides shade to stream bed; single-family residence construction may alter buffer at any time under same water quality and shade restrictions.

Buffer Requirements
- Reduced trout stream buffer width to 50-feet for all land-disturbing activities.
- Established a 25-foot buffer on springs and trout streams discharging an average annual flow of 25 gallons per minute (gpm) or less.
- Authorized piping of springs and trout streams discharging an average annual flow of 25 gpm or less to edge of landowner property. Landowner must notify EPD or local issuing authority of location and extent of piping and method for measuring volume.

Variances
- Required the Board to adopt rules by December 31, 2000 specifying criteria the EPD Director must use in granting or denying variances on warm-water and trout streams.
- Required the Board to adopt rules providing for a general variance for piping springs and trout streams discharging an average annual flow of 25 gpm or less.

Enforcement
- Specified procedures that must take place before issuing a stop work order. Except for actions resulting in imminent threat, the EPD Director must issue a written warning for first and second violations and allowing five days for corrective action. If not corrected, EPD Director may issue an order stopping work until violation corrected.
- Established a minimum civil penalty of $1000.00 per day for each violation/$250.00 per day for each violation involving a single-family residence.

2000
E & S Act amended.[212]

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Amended the public project exemption to require DOT and Georgia Tollway Authority projects disturbing 5 acres or more to have an erosion and sedimentation plan and to use BMPs.

Governance of Land-Disturbing Activities

- Authorized EPD to review and comment on DOT and Georgia Tollway Authority erosion and sedimentation plans.
- Created Erosion and Sediment Control Overview Council to provide recommendations on the preparation of DOT and Georgia Tollway Authority erosion and sedimentation plans and the installation and maintenance of BMPs.
- Required DOT and Georgia Tollway Authority to monitor water quality and inspect BMPs.
- Placed responsibility on construction contractor for implementation of BMPs.

2000

The General Stormwater Permit for Construction Activities under the National Pollution Discharge Elimination System (NPDES) in compliance with the federal Clean Water Act went into effect in August 2000 (valid for 3 years). The permit covers stormwater runoff from large municipalities, industrial sites and construction sites provides additional land-disturbing requirements governing erosion and sedimentation. Under the permit requirements (administered by EPD), persons seeking to disturb five or more acres of land (up to 250 acres) must file a Notice of Intent (NOI) with EPD, implement erosion and sedimentation control practices, monitor and record the amount of sediment leaving the site and file a Notice of Termination at the end of the land disturbance project.[213]

2000

Erosion and Sediment Control Overview Council is created in May 2000 as required in the 2000 amendments to the E & S Act (Senate Bill 524) and meets from January 2001 to December 2002. At its first meeting the scope of the Council is expanded from a focus on erosion and sedimentation plans and requirements for Department of Transportation and State Tollway Authority. Its expanded scope includes providing recommended changes to the E&S Act to eliminate the duplicative permitting system in place under the new federal NPDES stormwater program and the state E&S Act for land disturbing activities and address other concerns. The 2003 amendments to the E&S Act are substantially based on the recommendations of the Council and the Performance Audit (see 2001).[214]

2000

Storm Water General Permit Advisory Committee established in September 2000 is comprised of 20 individuals representing builders, developers, environmentalists, planners, enforcers, local governments, etc. The Committee met over 30 times to review and evaluate storm water regulations, to review and evaluate the effectiveness of the NPDES permit, to evaluate alternative methods and make recommendations for the re-issuance of the NPDES permit in 2003, and to evaluate BMPs for effectiveness. Recommendations of the Committee were provided to the Director of EPD.[215]

2000

Stream Buffer Variance Criteria Technical Advisory Committee, comprised of eight scientists; local government officials; engineers; and agricultural, fishing and environmental representatives, is appointed by the DNR Commissioner to provide guidance for the issuance of variances to buffer requirements on warm-water and trout streams, for general variance for trout streams with a mean annual flow less than 25 gpm and for piping of trout streams.[216]

2000
DNR's new warm-water and trout stream buffer variance criteria rules went into effect October 25, 2000, establishing a procedure and criteria reflecting the 2000 amendments to the E&S Act and incorporating recommendations of the Stream Buffer Variance Criteria Technical Advisory Committee.[217]

Variances will be considered only when request meets one of the following criteria:
- Unusual topography that prohibits opportunity for any development.
- Unusual circumstances create an extreme hardship (see 2002 for further definition).
- Construction or repair of structures that are by their nature located in the buffer.
- Restoration and enhancement to improve water quality and/or aquatic habitat quality.
- Of necessity to access property.
- Gravity-flow sewer lines.
- Utility lines.
- Recreational foot trails and viewing areas.

Piping of trout streams with an average annual flow of 25 gpm of less is provided under a general variance subject to the following terms:
- Total length of piped stream in any one property must not exceed 200 feet.
- Projects involving more than 200 feet of piping require an individual variance for the entire project.
- The downstream end of the pipe must terminate at least 25 feet before the property boundary.
- The applicant must notify the appropriate issuing authority of the location and extent of piping as part of permit application.
- Controls to reduce flow velocity to predevelopment level, if increased as a result of piping, must be employed and plans of such controls must be submitted with application.

To obtain this general variance, the applicant must demonstrate that the average annual flow is 25 gpm or less using one of three acceptable methods: 1) USGS unit area runoff map; 2) averaging three base flow measurements; or 3) via a hydrologic analysis.

2000
The Advisory Committee on Trout Stream Classification released its report, *A Recommended Process for Trout Stream Classification in Georgia* June 2000, concluding that the 72° Fahrenheit weekly average upper limit criterion established by the DNR Board in 1998 is the most inclusive and defensible criterion for listing/delisting trout waters but that population sampling must also be conducted to verify the absence of trout when the temperature is at the upper limit.[218]

2001
E & S Act amended.[219]

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Public water system reservoirs are exempted.

2001

The Georgia Department of Audits and Accounts responds to a request made by the Chairman of the Senate Appropriations Committee and a Resolution adopted by the DNR Board on January 24, 2001 to undertake a formal audit of the Erosion and Sedimentation Control Program. The 28-page Performance Audit, released in September, describes the program administration and enforcement, program requirements under law and rules and the roles of the administering entities including EPD, EPD Regional Offices, GSWCC, SWCD, Natural Resources Conservation Service (NRCS) and local governments. The Audit provides 10 recommendations to improve program effectiveness involving a need for improved erosion control, combining the E & S Act with the NPDES General Stormwater Permit, consolidating accountability in one agency, increasing coordination between EPD and GSWCC, establishing program goals and objectives for evaluating program effectiveness, better demonstration of local government capacity to implement program, broadening training requirements to all parties involved in land disturbing activities, ensuring necessary personnel and funding for EPD and GSWCC, authorizing user fees to support program costs, and facilitating the consolidation of issuing authority in joint agreements between local governments. In addition, the Audit provided five recommendations for the GSWCC to improve E&S Program oversight and four recommendations for EPD to enhance enforcement, improve complaint response and track Notice of Intents. Many of the recommendations of the Performance Audit compliment the discussions of the Erosion and Sediment Control Overview Council and inform the 2003 amendments to the E&S Act.[220]

2002

EPD lost an Administrative Appeal to Sembler Company (Athens, GA) for denial of a buffer variance. Unusual Circumstances Criteria is defined in an intra-office memo amending DNR Rule 391-3-7 Erosion and Sedimentation Control Stream Buffer Variances and instituted as new administrative guidance when reviewing buffer variance requests under these variance criteria. The Unusual Circumstances Criteria include:

- Substantial pre-construction costs for the project were expended prior to November 2000 when DNR's new stream buffer variance rules went into effect.
- The unavailability of alternative sites or additional property in order to avoid encroachment into the stream buffer.
- Alternative site plans would not provide the necessary economic yield to make the project feasible.
- The proposed plan and configuration were determined to be more protective of the environment than existing site conditions.

2003

The General Stormwater Permits for Construction Activities (NPDES) in compliance with the federal Clean Water Act is renewed and revised in accordance with EPA's Phase II NPDES stormwater regulations. Under the new permit requirements, persons seeking to disturb one or more acres of land (up to 250 acres) must file a NOI with EPD, implement erosion and

sedimentation control practices and monitor and record the amount of sediment leaving the site. A Notice of Termination must be filed at the end of the land disturbance project.[221]

2003
Georgia Water Quality Control Act amended.[222]

Authorized the Director of EPD to remain current with changes in requirements in the NPDES Program that allows the state to retain status as a delegated authority under the Federal Water Pollution Control Act, as amended (33 U. S. C. Section 1251, et seq.).

Authorized the Board of DNR to develop rules and regulations establishing a fee system to be used to implement the statewide NPDES general permit and permits for stormwater runoff from construction activities. The fee may not exceed $80.00 per acre of disturbed land and may be used by EPD or local issuing authorities only for implementation of the statewide NPDES general permit or a land-disturbing activity permit under the E & S Act, respectively. The Director of EPD is authorized to administer the fee system as adopted by the Board of DNR.

2003
E & S Act amended.[223]

Definition of Issuing Authority
Removed EPD as an issuing authority. Changed issuing authority to mean "local issuing authority".

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Included a single-family home construction exemption from 25/10 NTU instream turbidity standards for activities disturbing less than five acres.
- Amended the single-family residence exemption to include those projects/sites disturbing less than one acre.
- Amended the public project exemption to exempt DOT and Georgia Tollway Authority projects only when the agency is the primary permittee and the project disturbs less than 1 acre.
- Amended the public utility exemption to provided that projects are only exempt when a utility regulated by the Federal Energy Regulatory Commission, cable television system, or any agency, or instrumentality of the U.S. engaged in generating, transmitting or distributing power is a primary permittee.

Regulatory Threshold
Lowered the regulatory threshold to require projects of more than 1 acre to comply.

Governance of Land Disturbing Activities
- Coordinated permitting requirements under the E & S Act with those for NPDES stormwater under the federal Clean Water Act. Authorized a state general permit system (under O.C.G.A. §12-5-30) to align the requirements. Operators in certified jurisdictions submit applications to the local issuing authority. Operators in non-certified local issuing authorities

must submit to EPD a notice of intent for coverage under a state general permit. No bond requirement under general permits.
- Placed regulatory compliance responsibility on the site "operator," instead of the property owner.
- Authorized local issuing authorities to integrate E & S Act requirements with other land development ordinances; local land-disturbance permit must be at least as stringent as state general permit. Local permit may not exceed the general permit in monitoring, reporting, inspections, design standards, turbidity standards, and education and training requirements.
- Authorized local issuing authorities to take enforcement actions against many exempted projects/organizations, if the organization is a secondary permittee.
- Specified use of GSWCC hydraulic design specifications in meeting minimum standards.
- Removed requirement for permit applicants to be current on ad valorem taxes before permit issuance.
- Amended requirement for DOT and Georgia Road and Tollway Authority to submit erosion and sedimentation plan to reduce project threshold to one or more acres.
- Required Board to adopt rules and regulations by December 31, 2003 establishing certification/decertification requirements for local issuing authorities.
- Required SWCDs to approve/disapprove erosion and sedimentation control plans within 35 days of receipt. Failure to act within timeframe grants automatic approval.
- Created the 13-member Stakeholder Advisory Board appointed by the Governor to assist EPD and the GSWCC in establishing, evaluating and maintaining the education and training program.
- Required the Board to appoint a panel of not more than 16 members to study the new controls, turbidity standards, and standards more appropriate than turbidity. The panel will report its findings to the General Assembly by July 1, 2006.

Training Requirements
- Required all persons involved in land development design, review, permitting, construction, monitoring, or inspections or any land-disturbing activity after December 31, 2006 to meet education and training certification requirements developed by the GSWCC.
- Required the following training programs: fundamentals, advanced fundamentals, introduction to design, awareness, and trainer and instructor.
- Required at least four hours of continuing education courses every 3 years to maintain certification.

Fee System
- Added for first time.
- Established a permit fee system to offset costs of statewide implementation of NPDES general permit or local land-disturbing permit. Proceeds of fees are prohibited for other uses.
- Required Board to adopt rules and regulations by December 31, 2003 establishing a fee system administered by EPD. The fee cannot exceed $80.00 per acre of disturbed land.
- Required that fees be paid prior to permit issuance.
- Provided that half of levied fees go to local issuing authority and half to EPD. Under the general permit, EPD retains the full fee.

Buffer Requirements

- Established an exemption to the buffer requirements for stream crossings for water and sewer lines if crossing within 25 degrees of perpendicular and disturbance is not wider than 50 feet.

Enforcement
- Required local issuing authority to inspect and enforce permits it issues.
- Required the local issuing authority or by EPD Director for jurisdictions with no local authority to issue stop work orders for certain violations until violation corrected.

2003
E & S Act amended.[224]

Exemptions from Definition of Land-Disturbing Activity and Requirements
- Removed exemption from requirements of local land development ordinances for property owned by the local government and local school district.

2004
E & S Act amended.[225]

Variances
- Required the Board to adopt rules by December 31, 2004 specifying criteria the EPD Director must use in granting or denying variances on warms-waters of the state. The rules must include the following circumstances in which, at a minimum, the Director will consider granting a variance:
    1) When proposed activity requires a Section 404 permit and the Corps has approved a mitigation plan as a permit condition; and
    2) When the landowner provides a satisfactory mitigation plan that improves or maintains water quality.

APPENDIX B
DOCUMENTS REVIEWED

Federal Legislation
33 U.S.C. 466 (Public Law 89-234, 1965 Session) Federal Water Pollution Control Act

Official Code of Georgia and Legislative Amendments
O.C.G.A. 12-5-20 et seq. Georgia Water Quality Control Act
1957 Ga. Laws 629 (Senate Bill 133, 1957 Session)
1964 Ga. Laws 416 (House Bill 730, 1964 Session)
1966 Ga. Laws 316 (House Bill 335, 1966 Session)
1973 Ga. Laws 1288 (House Bill 1009, 1973 Session)
1974 Ga. Laws 599 (House Bill 1735, 1974 Session)
1978 Ga. Laws 2245 (House Bill 1967, 1978 Session)
1986 Ga. Laws 350 (House Bill 1280, 1986 Session)
1993 Ga. Laws 305 (House Bill 283, 1993 Session)
1995 Ga. Laws 150 (Senate Bill 375, 1995 Session)
1996 Ga. Laws 255 (House Bill 1788, 1996 Session)
2003 Ga. Laws 224 (House Bill 285, 2003 Session)

O.C.G.A. 12-7-1 et seq. Georgia Erosion and Sediment Act
1975 Ga. Laws 995 (House Bill 174, 1975 Session)
1980 Ga. Laws 942 (Senate Bill 137, 1980 Session)
1985 Ga. Laws 1225 (House Bill 35, 1985 Session)
1989 Ga. Laws 1295 (Senate Bill 84, 1989 Session)
1994 Ga. Laws 1650 (Senate Bill 608, 1994 Session)
1995 Ga. Laws 151 (Senate Bill 375, 1995 Session)
1998 Ga. Laws 1550 (House Bill 1087, 1998 Session)
2000 Ga. Laws 1430 (House Bill 1426, 2000 Session)
2000 Ga. Laws 1673 (Senate Bill 524, 2000 Session)
2001 Ga. Laws 892 (House Bill 206, 2001 Session)
2003 Ga. Laws 224 (House Bill 285, 2003 Session)
2003 Ga. Laws 270 (House Bill 509, 2003 Session)
2004 Ga. Laws (Senate Bill 460, 2004 Session)

O.C.G.A. 27-1-1 et seq. Game and Fish Commission
1955 Ga. Laws 483 (Senate Bill 60, 1955 Session).
1977 Ga. Laws 396 (House Bill 792, 1977 Session).
1978 Ga. Laws 816 (House Bill 1543, 1978 Session).
1979 Ga. Laws 678 (House Bill 456, 1979 Session).
1982 Ga. Laws 1771 (Senate Bill 626, 1982 Session).
1998 Ga. Laws 1550 (House Bill 1087, 1998 Session).

Executive Reorganization Act of 1972
1972 Ga. Laws 1015 (Senate Bill 499, 1972 Session)
1972 Ga. Laws 1266 (Senate Bill 644, 1972 Session)

Senate Resolution 142, 1975 Regular Session
House Resolution 339, 1975 Regular Session
Senate Resolution 252, 1993 Regular Session

Proposed Georgia Legislation
House Bill 350, 1995 – 96 Session
House Bill 1359, 1997 – 98 Session
House Bill 1593, 1997 – 98 Session
Senate Resolution 644,1997 - 98 Session
House Bill 1426, 1999-00 Session
House Bill 420, 2001 – 02 Session

Opinions of the General Attorney
1987 AG Op. 87-20
1990 AG Op. 90-40
1993 AG Op. 93-7

Rules and Regulations
Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6, Water Quality Control, Revised February, 2004.
Rules of State Water Quality Control Board, State of Georgia, Chapter 730-03, Water Use Classifications and Water Quality Standards, June 1967.
Rules of State Water Quality Control Board, State of Georgia, Chapter 730-03, Standards of Water Purity, March 1965.
Rules of State Game and Fish Commission, Chapter 260-4-.40, Trout Fishing Regulations, Water Quality Purposes, September 1971.
Rules of the Georgia Department of Natural Resources, Wildlife Resources Division, Chapter 391-4-3-.11, Trout Stream Designation for Water Quality Purposes, September 1996.
Rules of the Georgia Department of Natural Resources, Wildlife Resources Division, Chapter 391-4-3-.03, Seasons and Trout Water Designations, October 1999.
Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-7, Erosion and Sedimentation Control, Revised December, 2003.

Memoranda
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APPENDIX C
SURVEY FOR LOCAL ISSUING AUTHORITIES

Permit Issuance / Issuing Authority

1. What is the total number of land disturbance permits issued per year for: 1999, 2000, 2001, 2002, and 2003?
2. What is the number of those permits issued for activities on trout stream waters per year?
3. How have the 2003 E&S Amendments (HB 285) affected LDA permit issuance (i.e., the SWCD must approve/disapprove E&S Control Plans within 35 days or an automatic approval is granted; established a $40.00/acre disturbed fee)?
4. Does your jurisdiction intend to continue its status as a certified local issuing authority under the new NPDES General Permit and revised E & S Act (local governments must adopt revised E&S ordinance by 7/1/04)?

Buffer Variances and Procedures

5. Variances are required in the: 1) presence of state waters and 2) presence of wrested vegetation. How are determinations of "state waters" made in your jurisdiction?
6. Do you have any comments on how the variance procedure undertaken by EPD is working for your jurisdiction?

Piping of Small Streams

7. Landowners are allowed to pipe streams of 25 gallons per minute and less under a general permit but they must notify the issuing authority of the piping. What is the total number of notifications of piping by landowners per year for: 2001, 2002, and 2003?
8. Landowners are required to provide the following information to the issuing authority as part of their terms of the piping of small streams:
   - Location of piping
   - Extent of streams piped (200' or less allowed and must end at least 25 feet before the property boundary)
   - Flow methodology used (1 of 3) to determine average annual flow-25 gpm or less
   - Control Plan to reduce flow to predevelopment level

   Can you supply a copy of this information for each notification?
9. What is the number of pipings that have occurred in violation of the notification requirement and/or the above terms per year for: 2001, 2002, and 2003?
10. Do you have any comments on how the piping general permit is working for your jurisdiction?

Enforcement

11. How many E & S inspectors worked per year for: 1999, 2000, 2001, 2002, and 2003?
12. What is the estimated LDA permit inspection frequency schedule per inspector per year for: 1999, 2000, 2001, 2002, and 2003?
13. What is the number and type of enforcement actions taken for land disturbing activities on warm water and trout streams in years 1999, 2000, 2001, 2002, and 2003?
14. What is the total number of sites that have been clear cut (including buffer) under a forestry exemption and later built upon within 3 years of the clear cut per year for 2001, 2002, and 2003?

General Question

15. Do you have any suggestions for improving the E & S program at the state or the local level?

APPENDIX D
NUMBER OF TROUT STREAM BUFFER VARIANCE REQUESTS AND DISPOSITIONS BY COUNTY, TOTAL MILES OF TROUT STREAMS AND GROWTH RATES

County	1999				2000				2001				2002				2003				Trout Streams	1990 - 2000 Growth Rate
	R	A	D	W	R	A	D	W	R	A	D	W	R	A	D	W	R	A	D	W	(miles)	(%)
Bartow									4	1		3									257	36.0
Carroll					4	3	1		1	1											10	22.2
Catoosa					1	1			9	4	1	4									77	25.5
Chattooga																					244	14.5
Cherokee	1	1			11	9	1	1	18	12	2	4					1	1			71	57.3
Dade					1		1		2		1	1									65	15.3
Dawson	1	1			2	1		1	4	2		2	3	1		2					165	69.7
Fannin	11	5	2	4	3	1	2		14	2	4	8	8	2		6	13	2	3	8	557	23.8
Floyd	1	1			1	1			2	1	1										167	11.5
Gilmer	13	7	4	2	5		4	1	6	1	1	4	6			6	2	1		1	598	75.5
Gordon																					106	25.8
Habersham	4	4							4	2		2	4			4	3	2		1	183	30.0
Haralson									2			2									114	17.0
Lumpkin	4	3		1	2	1		1	4	2		2	2			2	2			2	348	44.2
Murray									2			2									208	39.6
Paulding					4	2	2		3	2		1									105	96.3
Pickens	7	6	1		2	1	1		5			5	2	1		1					261	59.3
Polk									2	1	1										96	12.8
Rabun	15	12	1	2	7	3	2	2	8	1	1	6	4			4	5	3		2	479	29.2
Stephens					1	1			1	1											53	8.5
Towns	4	4			2	2			3		1	2	1			1	3			3	219	38.0
Union	18	16		2	2	1	1		6	4		2	8	3		5	11	3		8	434	44.2
Walker					2	1	1														339	4.7
White	5	5			3	3			7	4		3	5	2	1	2	3	2		1	206	53.3
Whitfield					1			1	3		1	2									75	15.3
Totals	84	65	8	11	54	31	16	7	110	41	14	55	43	9	1	33	43	14	3	26	5,437	

* The 14 counties in the Trout Stream Buffer Study are indicated in red.

** The disposition letters represent

R Total requests made

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D Denials

W Withdrawals

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