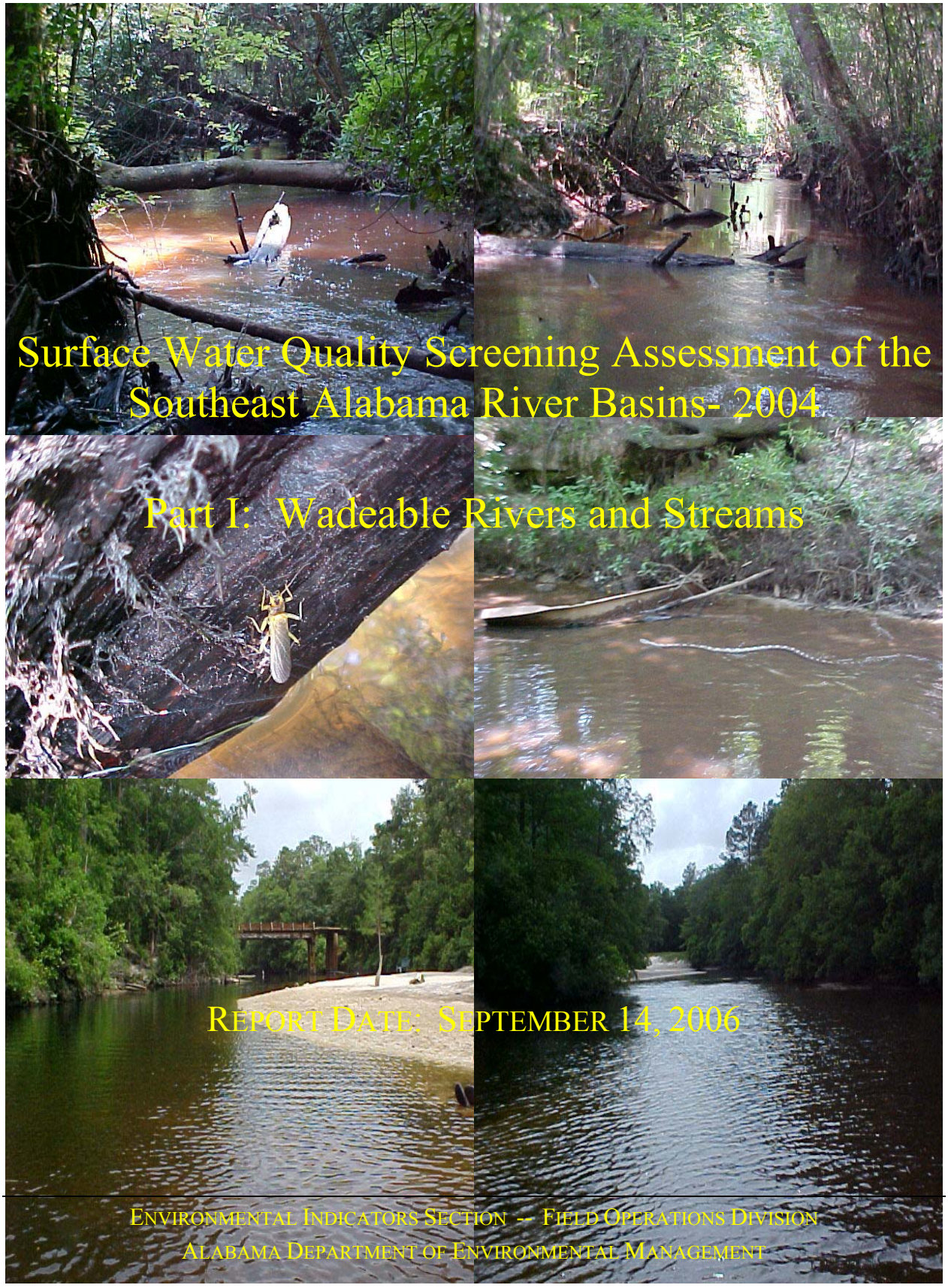


Surface Water Quality Screening Assessment of the Southeast Alabama River Basins- 2004

Part I: Wadeable Rivers and Streams

REPORT DATE: SEPTEMBER 14, 2006

ENVIRONMENTAL INDICATORS SECTION -- FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Surface Water Quality Screening Assessment of the Southeast Alabama River Basins- 2004

Part I: Wadeable Rivers and Streams

REPORT DATE: SEPTEMBER 14, 2006

ENVIRONMENTAL INDICATORS SECTION -- FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

THIS PROJECT WAS FUNDED OR PARTIALLY FUNDED BY THE ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT USING A CLEAN WATER ACT §319(H) NONPOINT SOURCE DEMONSTRATION GRANT PROVIDED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY - REGION 4.

ADDRESS COMMENTS AND QUESTIONS TO :

ENVIRONMENTAL INDICATORS SECTION
FIELD OPERATIONS DIVISION – MONTGOMERY BRANCH
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
P.O. 301463
MONTGOMERY, ALABAMA 36130-1463

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Interpretation
§	Section
A&I	Agricultural and Industrial Water Use Classification
ADEM	Alabama Department of Environmental Management
ALAMAP	Alabama Monitoring and Assessment Program
AU	Animal Unit as defined by ADEM CAFO Rules
AWPCA	Alabama Water Pollution Control Act
BMP	Best Management Practices
Br	Branch
CAFO	Concentrated Animal Feeding Operation
cfs	Cubic Feet per Second
Chem.	Chemical/Physical Water Quality
Co.	County
Confl.	Confluence
Cr	Creek
CR	County Road
CU	Cataloging Unit
CWA	Clean Water Act
CWP	Clean Water Partnership
ds	Downstream
E	East
EIS	Environmental Indicators Section of ADEM's Field Operations Division
EMT	Escatawpa, Mobile Bay, Tombigbee Basin Group
EPA	U.S. Environmental Protection Agency
EPT	Ephemeroptera, Plecoptera, and Trichoptera
F&W	Fish and Wildlife Water Use Classification
Fk	Fork
FOD	Field Operations Division
GPS	Global Positioning System
GSA	Geological Survey of Alabama
H	Shellfish Harvesting Water Use Classification
IBI	Index of Biotic Integrity (fish community)
L	Lower
LWF	Limited Warmwater Fishery
Macroinv.	Aquatic Macroinvertebrate
MB-EPT	Multihabitat Bioassessment for Ephemeroptera, Plecoptera and Trichoptera
mg/L	Milligrams per Liter
mgd	millions of gallons per day
mi^2	square miles
Mod.	Moderate
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
nr	Near
NRCS	Natural Resources Conservation Service
OAW	Outstanding Alabama Water Water Use Classification
ONRW	Outstanding National Resource Waters Water Use Classification
OE/DO	Organic Enrichment/Dissolved Oxygen
PWS	Public Water Supply Water Use Classification
R	River
Rd	Road
RM	River Mile

Abbreviation	Interpretation
S	Swimming and Other Whole Body Water-Contact Sports Water Use Classification
SSWCC	State Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TNTC	Too numerous to count
TVA	Tennessee Valley Authority
µg/g	Micrograms per Gram
µg/L	Micrograms per Liter
U	Upper
ur	Unreported
us	Upstream
W	West
WQDS	Water Quality Demonstration Study

INTRODUCTION

Background: The goal of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's Waters (Water Pollution Control Federation 1987). As the state's environmental agency, the Alabama Department of Environmental Management (ADEM) establishes water quality standards and implements management programs to meet this goal. The ADEM conducts monitoring to evaluate the effectiveness of these programs and to determine water quality status and trends.

Section 303(d) of the CWA (§303(d)) requires that each state identify those waters that do not currently support water quality standards or designated uses. For each waterbody on the list, the state is required to establish a Total Maximum Daily Load (TMDL) for the pollutant or pollutants of concern at a level necessary to implement the applicable water quality standards. Nationwide, this process has been most effective at addressing impairments caused by point source discharges. However, 236 nonpoint source pollutants from 303 sources were on Alabama's 2002 §303(d) list. Pollutants from point sources accounted for only 47 (15%) of the 303 total sources listed.

Since 1998, ADEM's voluntary, incentive-based nonpoint source management program has been implemented through ten basinwide Clean Water Partnership (CWP) Projects. Through these partnerships, management plans are developed and implemented for each basin. The partnerships allow for participation and collaboration among community-based groups, government agencies, industry, farms, forestry, special interest groups, and individual citizens.

In 2003, the USEPA linked CWA §319 funding to the TMDL process to begin to implement nonpoint source control activities more effectively. To obtain funding, a Watershed Plan that addresses an approved TMDL must be developed. The Watershed Plan must describe a holistic strategy to improve, maintain, or protect water quality, it must address both point and nonpoint source issues within the watershed, and it must describe how nonpoint source load reductions will be achieved.

ADEM Monitoring and Management Strategy: From 1997 to 2004, ADEM used a 2-phased monitoring approach to identify impaired waters, determine the causes and sources of impairment, and evaluate the effectiveness of pollution control activities. This approach concentrates ADEM's resources in areas with the greatest potential for impairment and where more intensive monitoring is required. Phase I monitoring, completed using ADEM's basinwide screening-level assessment methods, is conducted on a repeating 5-year management cycle during ADEM's Nonpoint Source (NPS) Monitoring Program to evaluate water quality, estimate water quality status and trends, and evaluate causes and sources of impairment.

During Phase I, basinwide screening assessments were conducted at stream reaches in watersheds where landuse estimates and NPS information from the local Soil and Water Conservation Districts (SWCD) suggested a relatively moderate or high potential for impairment for nonpoint sources in nonurban areas. Stations in these watersheds that

received a macroinvertebrate assessment rating of "fair" or "poor" were placed on a list of priority sub-watersheds. The list was then used by ADEM's Office of Education and Outreach (OEO) to prioritize sub-watersheds for §319 funding to concentrate Best Management Practices (BMP) implementation in areas with moderate or high risk landuse practices, but also provided flexibility to administer funds in areas where stakeholder interest was greatest.

Results of all data collected during the basinwide screening projects, as well as all other data included in the final report, were reviewed by ADEM's WQ section to categorize each of the waterbodies in the biennial Integrated Report. Water bodies on the NPS priority sub-watershed list are prioritized for further monitoring to fully assess the extent, causes, and sources of potential impairment at these sites.

The Environmental Indicators Section (EIS) of ADEM's FOD has completed basinwide NPS screening assessments of the Black Warrior (1997), the Tennessee (1998), the southeast Alabama river basins (1999), the Alabama, Coosa, and Tallapoosa River basins (2000), and the Escatawpa, Mobile Bay, and Tombigbee River basins (2001). The EIS completed the 2nd basinwide screening assessment of the Black Warrior and Cahaba River (BWC) basins (2002) and the Tennessee River basin (2003). Statewide, the results of these assessments have identified 179 NPS priority sub-watersheds. Data and information collected during these assessments have been used to direct CWA §319 funds, develop nonpoint source basin management plans, and to direct intensive monitoring efforts. The results of these assessments have been reported in 11 separate documents (ADEM 1999a, ADEM 2000a, ADEM 2002a, ADEM 2002b, ADEM 2002c, ADEM 2002d, ADEM 2002e, ADEM 2002f, ADEM 2003c, ADEM 2003d, and ADEM 2005a). Copies can be obtained at www.adem.state.al.us

Phase II monitoring projects, completed using watershed-specific, intensive assessment methods, are implemented at a much smaller scale and a more frequent monitoring cycle. Water quality data collected from these projects assist ADEM's Nonpoint Source (NPS) Unit in assessing the needs and effectiveness of best management practice implementation efforts.

1999 SE AL Basinwide Screening Assessments: The 1999 SE AL Basinwide Screening Assessment was the first project in which ADEM used the 1998 Soil and Water Conservation District (SWCD) sub-watershed assessments to identify sub-watersheds for screening-level assessments. Sub-watersheds were selected for assessment if they were identified as a priority by the local SWCD, if recent monitoring data were not available, if potential impacts from point sources or urban areas were minimal, and if sub-watershed drainages were approximately 30 square miles or larger. In addition, sampling was coordinated among projects, such as ALAMAP, CWA §303d Monitoring, the Middle Chattahoochee Water Quality Study (Chattahoochee), and the Southeast Alabama Poultry Industry Impact Study (Choctawhatchee-Pea) to maximize the number of streams assessed and to prevent duplication of effort. ADEM reported bioassessment results for 32 of 137 eleven digit Hydrologic Unit Code (HUC) sub-watersheds (23%). Twenty seven of the 32 sub-watersheds assessed were included on the 1999 NPS priority sub-watershed list. The

results and methods used during this process are fully described in ADEM 2002 a, 2002b, and 2002c.

2004 SE AL Basinwide Screening Assessments: In 2004, ADEM used the 1998 SWCD sub-watershed assessments to rank each 11-digit HUC as having a relatively low, moderate or high potential for impairment from nonpoint sources. This process identified 75 sub-watersheds with relatively moderate or high potential for NPS impairment. Sixty-eight of the 75 sub-watersheds were not assessed during the 1999 SE AL Basin Screening Assessment. Therefore, the screening assessment process was continued during 2004 to provide a more complete listing of NPS Priority sub-watersheds in the SE AL basins.

Final Report: The purpose of this document is to provide a complete list of NPS priority sub-watersheds based on the 1999 and 2004 Basinwide Screening Assessment results. The document includes a description of the methods used during the 2004 screening assessment. Data collected during the project have been compiled in Appendices D – I. The information assembled in this report may be used by ADEM's Water Quality Branch to support listing and delisting of stream segments on the §303(d) list of impaired waterbodies and by the ADEM NPS Unit to assist with the development of NPS watershed management plans.

METHODOLOGY

STUDY AREA

The study area includes the Chattahoochee, Chipola, Choctawhatchee and Perdido-Escambia River basins encompassing twenty (20) counties in southeast Alabama. The area includes sixteen (16) hydrologic cataloging units, 137 sub-watersheds and 11,563 mi^2 of drainage area. The Chattahoochee River is located on the eastern boundary of Alabama (Fig 1). It has 2,832 mi^2 of drainage in Alabama and is located within portions of Randolph, Chambers, Lee, Russell, Barbour, Henry, and Houston Counties. The Chipola River basin in Alabama is located in Houston and Geneva Counties and drains 258 mi^2 of Alabama (Fig 1.). The Choctawhatchee River Basin in Alabama has 3,130 mi^2 of drainage that flows through Bullock, Barbour, Henry, Houston, Geneva, Dale, Pike, Coffee, and Covington Counties (Fig 2).). The Perdido-Escambia River basin in Alabama encompasses 5,343 mi^2 of drainage that flows through Montgomery, Pike, Crenshaw, Covington, Butler, Conecuh, Escambia, Monroe, and Baldwin Counties (Figs. 3 and 4). (USDASCS 1995).

Table 1 lists the 137 sub-watersheds within each basin. Sub-watersheds containing §303 (d) listed waterbodies with EPA-approved TMDLs are also indicated.

Table 1. Sub-watersheds of the SE AL River Basins

Cataloging Unit	Sub-Watershed	Cataloging Unit	Sub-Watershed
0313-0002 Middle Chattahoochee – Lake Harding		**0314-0201 Upper Choctawhatchee River**	
100	Hillabahatchee Cr.	010	U. E. Fk. Choctawhatchee R.
190	Wehadkee Cr.	020	L. E. Fk. Choctawhatchee R.
200	Stroud Cr.	030	Blackwood Cr.
220	Oseligee Cr.	040	Kelley Creek
250	Moores Cr.	050	U. W. Fk. Choctawhatchee R.
260	Lake Harding Tributaries	060	Bear Cr.
290	Osanippa Cr.	070	L. W. Fk. Choctawhatchee R/
300	U. Hallawakee Cr.	080	U. Judy Cr.
310	L. Hallawakee Cr.	090	Little Judy Cr.
320	Wacoochee Cr.	100	L. Judy Cr.
360	Soap Cr.	110 [b]	Sconyers Cr.
0313-0003 Middle Chattahoochee – W.F. George Reservoir		120	Kilibree Mill Cr.
020	Mill Cr.	130 [b]	Little Choctawhatchee R.
060	Little Uchee Cr.	140	U. Clay Bank Cr.
070	U. Uchee Cr.	150 [b]	Steep Head Cr.
080	L. Uchee Cr.	160	L. Clay Bank Cr.
100	Ihagee Cr.	170	Harrand Cr.
120	Hatchechubbee Cr.	180	Cowpen Cr.

Table 1. Sub-watersheds of the SE AL River Basins, continued.

Cataloging Unit	Sub-Watershed
0313-0003 Middle Chattahoochee – W.F. George Reservoir (cont.)	
130	North Fk. Cowikee Cr.
140	Middle Fork Cowikee Cr.
150	South Fork Cowikee Cr.
160	Lower Cowikee Cr.
180 [b]	Barbour Cr.
0313-0004 Lower Chattahoochee R.	
020	McRay Mill Cr.
040	Abbie Cr.
050	Foster Cr.
060 [b]	Omussee Cr.
080	Cedar Cr.
100	Bryans Cr.
0313-0012 Chipola R.	
010	Cowarts Cr.
030 [a b]	Big Cr.
0314-0103 Yellow R.	
010	Yellow R.
020 [b]	Lightwood Knot Cr.
030	Pond Cr.
040	Poley Cr.
050	Yellow R.
060	Clear Cr.
070	North Cr.
080	Five Runs Cr.
090 [b]	Yellow R.
110	Big Horse Cr.
190	Horsehead Cr.
0314-0104 Blackwater R.	
010 [b]	Blackwater R.
040	Panther Cr.
080	Big Juniper Cr.
100	Sweetwater Cr.
140	E. Fork Big Coldwater Cr.
170	West Fork Big Coldwater Cr.
0314-0106 Perdido R.	
010	Perdido R.
020	Perdido R.
040	Dyas Cr.
050	Indian Cr.
060	U. Brushy Cr.
070 [b]	Brushy Cr.
100	Nelson Branch
110	Loggerhead Cr.

Cataloging Unit	Sub-Watershed
0314-0201 Upper Choctawhatchee River (cont.)	
190	Line Creek
200	Brackins Mill Cr.
210	Wilkerson Cr.
220	Choctawhatchee River
230	Upper Double Bridges Cr.
240	Tight Eye Cr.
250	L. Double Bridges Cr.
0314-0202 Pea R.	
010	Pea R.
020	Pea Cr.
030	Buckhorn Cr.
040	Pea R.
050	Whitewater Cr.
060 [b]	Walnut Cr.
070	Whitewater Cr.
080	Big Cr.
090	Whitewater Cr.
100	Pea R.
110	Flat Cr.
130	Corner Cr.
140	Pea R.
0314-0203 L. Choctawhatchee R.	
010	Spring Cr.
050	Wrights Cr.
130	Holmes Cr.
0314-0301 U. Conecuh R.	
010	Conecuh R.
020	Mannings Cr.
030 [a b]	Conecuh R.
040 [a b]	Conecuh R.
050	Conecuh R.
0314-0302 Patsaliga R.	
010	Olustee Cr.
020	Blue Cr.
030	U. Patsaliga Cr.
040	Little Patsaliga Cr.
050	L. Patsaliga Cr.
060	Buck Cr.
0314-0303 Sepulga R.	
010	Sepulga R.
020	U. Persimmon Cr.
030 [b]	L. Persimmon Cr.
040	Sepulga R.

Table 1. Sub-watersheds of the SE AL River Basins, continued

Cataloging Unit	Sub-Watershed
0314-0106 Perdido R., cont.	
140	Perdido R.
150	Rices Branch
170 [b]	Styx R.
180	Cowpen Cr.
190 [b]	Blackwater R.
0314-0107 Perdido Bay	
020	Soldier Cr.
030	Miflin Cr.
040 [b]	Wolf Cr.
0314-0303 Sepulga R., cont.	
050	U. Pigeon Cr.
060	L. Pigeon Cr.
070	Sepulga R.
0314-0304 L. Conecuh R.	
010 [b]	Conecuh R.
020	U. Murder Cr.
030	L. Murder Cr.
040	Cedar Cr.
050	Burnt Corn Cr.
060	Franklin Mill Cr.
070	Jernigan Mill Cr.
090 [b]	Little Escambia Cr.
0314-0305 Escambia R.	
010	Big Escambia Cr.
020	Big Escambia Cr.
030	Sizemore Cr.
040 [b]	Big Escambia Cr.
070	Pritchetts Mill Branch
090	Canoe Cr.
130	Pine Barren Cr.

a = sub-watershed contains an EPA-Approved TMDL.

b = sub-watershed contains a §303(d) listed stream.

Fig. 1. Sub-watersheds of the Chattahoochee and Chipola River basins

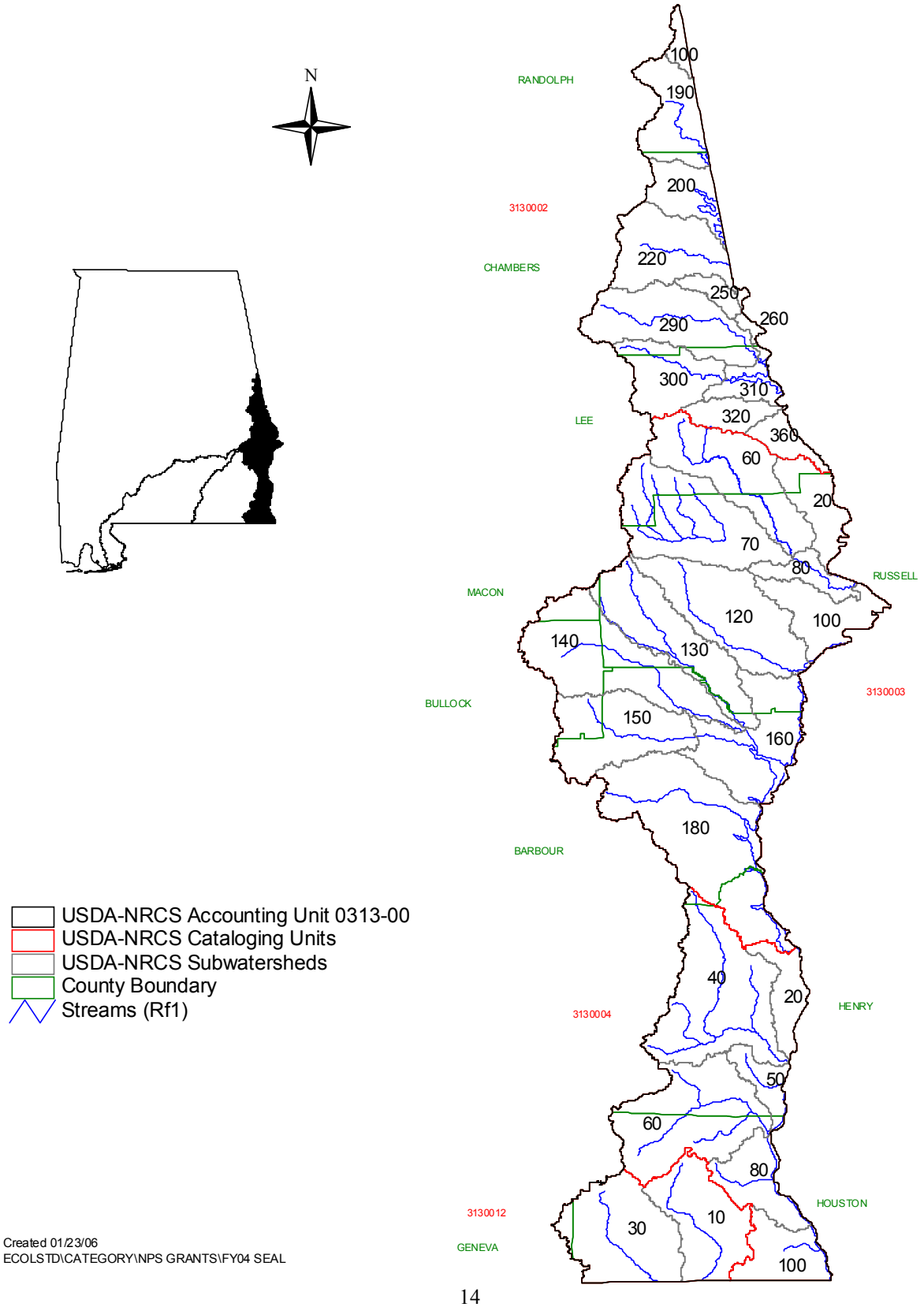


Fig. 2. Sub-watersheds of the Choctawhatchee and Pea River basins

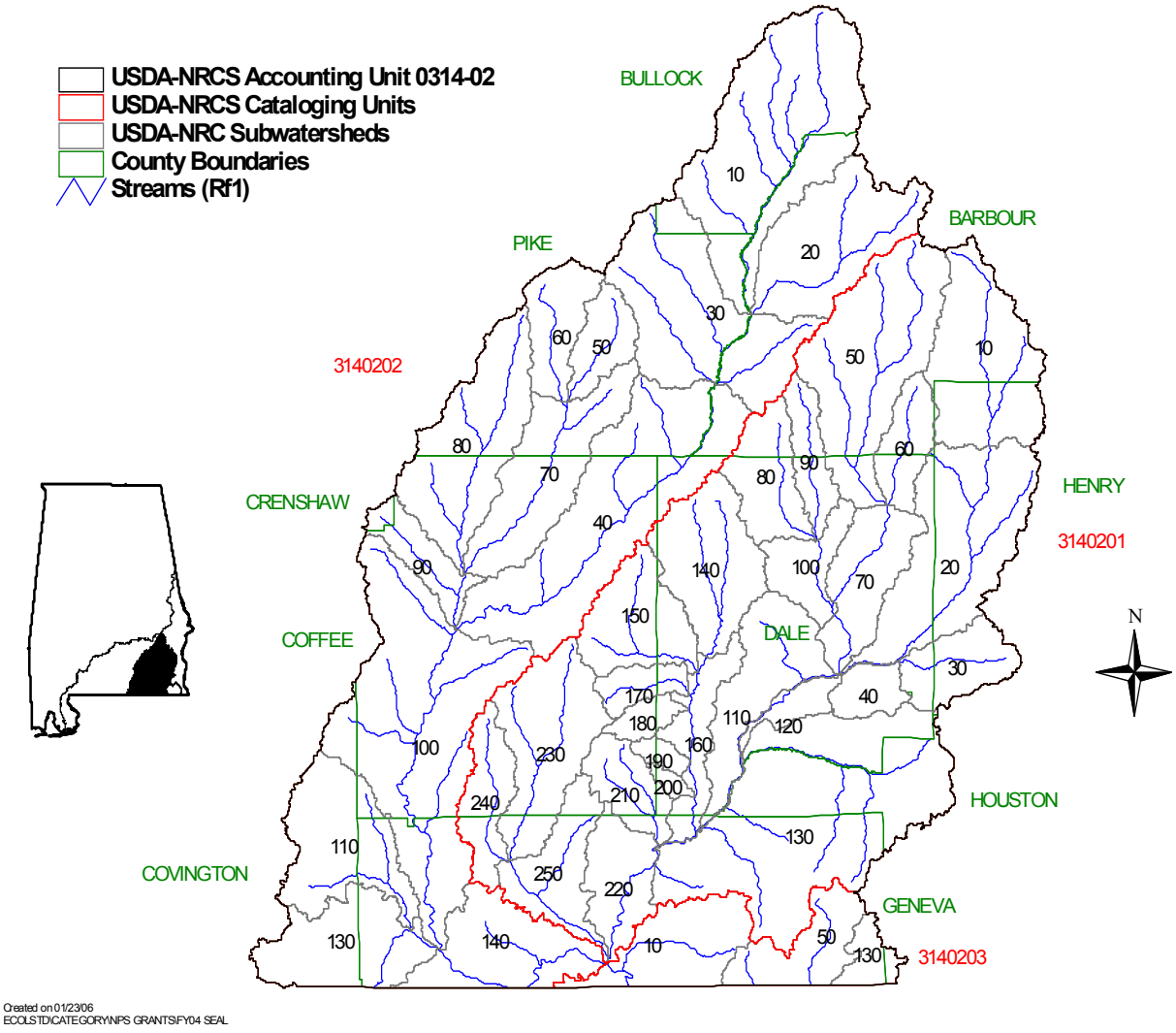


Fig. 3. Sub-watersheds of the Escambia River basin

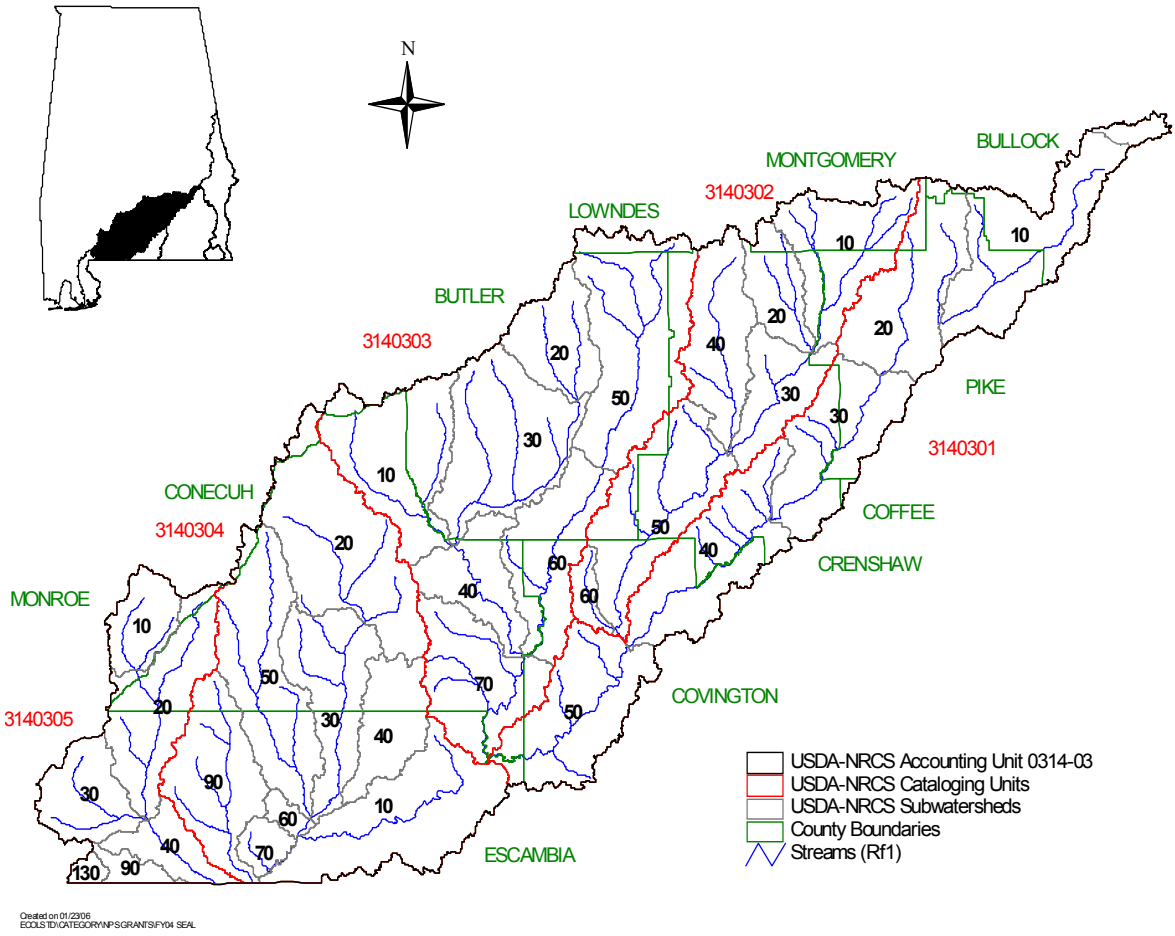
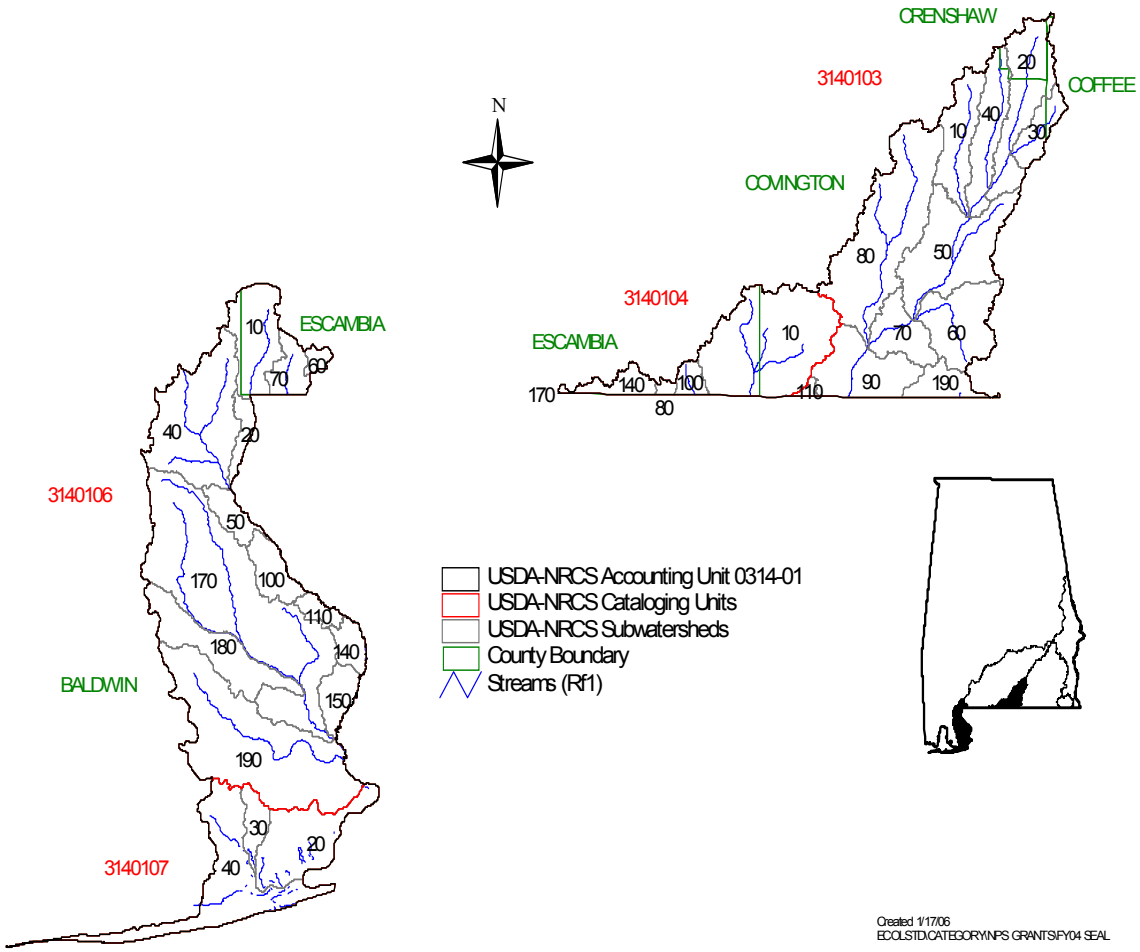


Fig. 4. Sub-watersheds of the Perdido River basin



ECOREGIONS

The SE AL basins are located as far north as the ***Piedmont (45)*** ecoregion, above the Fall Line to the east southward to the coastal regions of Baldwin and Mobile Counties located in the ***Southern Coastal Plains (75),*** with the majority located in between, in the ***Southeastern Plains (65)*** ecoregion (Figs. 5-8).

Piedmont (45): The ***Outer Southern Piedmont (45b)*** subecoregion, which drains the upland areas of the Chattahoochee River basin in Randolph, Chambers, and Lee Counties, is characterized by dissected irregular plains and low-to-moderate gradient streams with cobble, gravel, and sand substrates. Elevations are generally 335-945 feet; relief ranges from 100-300 feet (Griffith et al. 2001).

Widespread forest clearing and farming in the 1800's and early part of the 1900's led to high rates of soil erosion (Trimble 1974). The history of soil erosion greatly increased sediment loads in the streams and rivers with extensive deposits of sand and silt on the floodplains (Mulholland and Lenat 1992). These deposits continue to serve as a source for sediment transport.

The Piedmont has little original topsoil, and the red clay subsoil remaining is not as productive. With loss of soil fertility and abandonment of farmland, much of the Piedmont is used for pasture, hay, and cattle production.

Southeastern Plains (65): The flat to undulating ***Blackland Prairie (65a)*** is characterized by distinctive chalk, marl, and calcareous clay with poor drainage. Stream flows tend to vary with both season and rainfall. Elevations are generally 150-250 feet. The area's natural vegetation of sweetgum, post oak, red cedar, and blue stem prairie has been transformed to cropland and pasture, with small patches of mixed hardwoods. Pond-raised catfish aquaculture has increased in recent years.

The ***Flatwoods/Blackland Prairie Margins (65b)*** subecoregion combines two slightly different areas. The Flatwoods consist of a mostly-forested lowland area of little relief, formed primarily on dark, massive marine clay. Soils are deep, clayey, poorly drained, and acidic. The Blackland Prairie Margins are undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have heavy clay soils with generally poor drainage.

The ***Southern Hilly Gulf Coastal Plain (65d***) drains portions of the Middle Chattahoochee - W.F. George and Lower Chattahoochee CUs, portions of the Escambia River and Choctawhatchee Accounting Units. This subecoregion is characterized by dissected irregular plains and gently rolling hills. It developed over diverse east-west trending bands of sand, clay, and marl formations. Broad cuestas with gentle south slopes and steeper north facing slopes are common. It has more rolling topography, higher elevations, more relief, and higher-gradient streams than 65a, 65b, and 65g. The natural vegetation of oak-hickory-pine forest grades into southern mixed forest to the south. Land cover is mostly forest and woodland with some cropland and pasture.

Most of the Perdido River basins and the southern half of the Escambia River basin are located within the ***Southern Pine Plains and Hills subecoregion (65f)*** (Fig. 7). Elevations within the subecoregion are generally 200-550 feet, with relief of 100-200 feet

between hill and stream bottoms. The hill summits and higher elevations are composed of Citronelle formation, generally sandy, gravelly, porous, and more resistant to erosion than the older underlying sandstones. Most of this subecoregion is woodland and forest with some cropland and pasture, with extensive agriculture along the eastern border of the subecoregion (Griffith et. al 2001).

The ***Dougherty Plains subecoregion (65g)*** is located in the Dougherty Plains of Southeast Alabama. These are flat to rolling plains with elevations generally 100-300 feet. Soils are sandy to clayey over residuum geology derived from solution and collapse of limestone. The streams in this area are characterized by braided channels and slightly- to moderately-tannic water. The floodplains are large with low stream banks and shaded channels.

The northern-most section of the Chattahoochee River basin falls within the ***Fall Line Hills (65i)*** subecoregion. This area is composed primarily of loamy and sandy sediments. It is mostly forested terrain of oak-hickory-pine on hills with 200-400 foot relief.

The ***Southeastern Floodplains and Low Terraces (65p)*** comprise a riverine ecoregion of large sluggish rivers and backwaters with ponds, swamps, and oxbow lakes. Within these basins, the subecoregion defines the riparian zone of the Chattahoochee River. River swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important wildlife corridors and habitat. In Alabama, cropland is typical on the higher, better-drained terraces, while hardwoods cover the floodplains.

A very small portion of the Escambia River basin is located within the ***Buhrstone/Lime Hills (65q***) subecoregion. The subecoregion has some of the most rugged terrain of the Alabama coastal plain. The rough, hilly topography is attributed to the hardened beds of claystone, sandstone, and resistant limestones. Many of the streams have relatively high gradients and hard-rock bottoms.

Southern Coastal Plain (75): The coastal areas of the Perdido River and Perdido Bay CUs are located in 2 subecoregions of the Southern Coastal Plain Ecoregion (Fig. 8). The ***Gulf Coast Flatwoods (75a)*** subecoregion is a narrow region of nearly level terraces and delta deposits composed of sand and clays. Wet, sandy flats and broad depressions that are locally swampy are usually forested, while some of the better-drained land has been cleared for pasture or crops. The ***Gulf Barrier Islands and Coastal Marshes (75k)*** subecoregion contain salt and brackish marshes, dunes, beaches, and barrier islands that enclose the Mississippi Sound and Mobile Bay. To date, ADEM has not developed assessment guidelines for this ecoregion.

Fig. 5. Level III and IV Sub-Ecoregions of the Chattahoochee and Chipola River Basins.

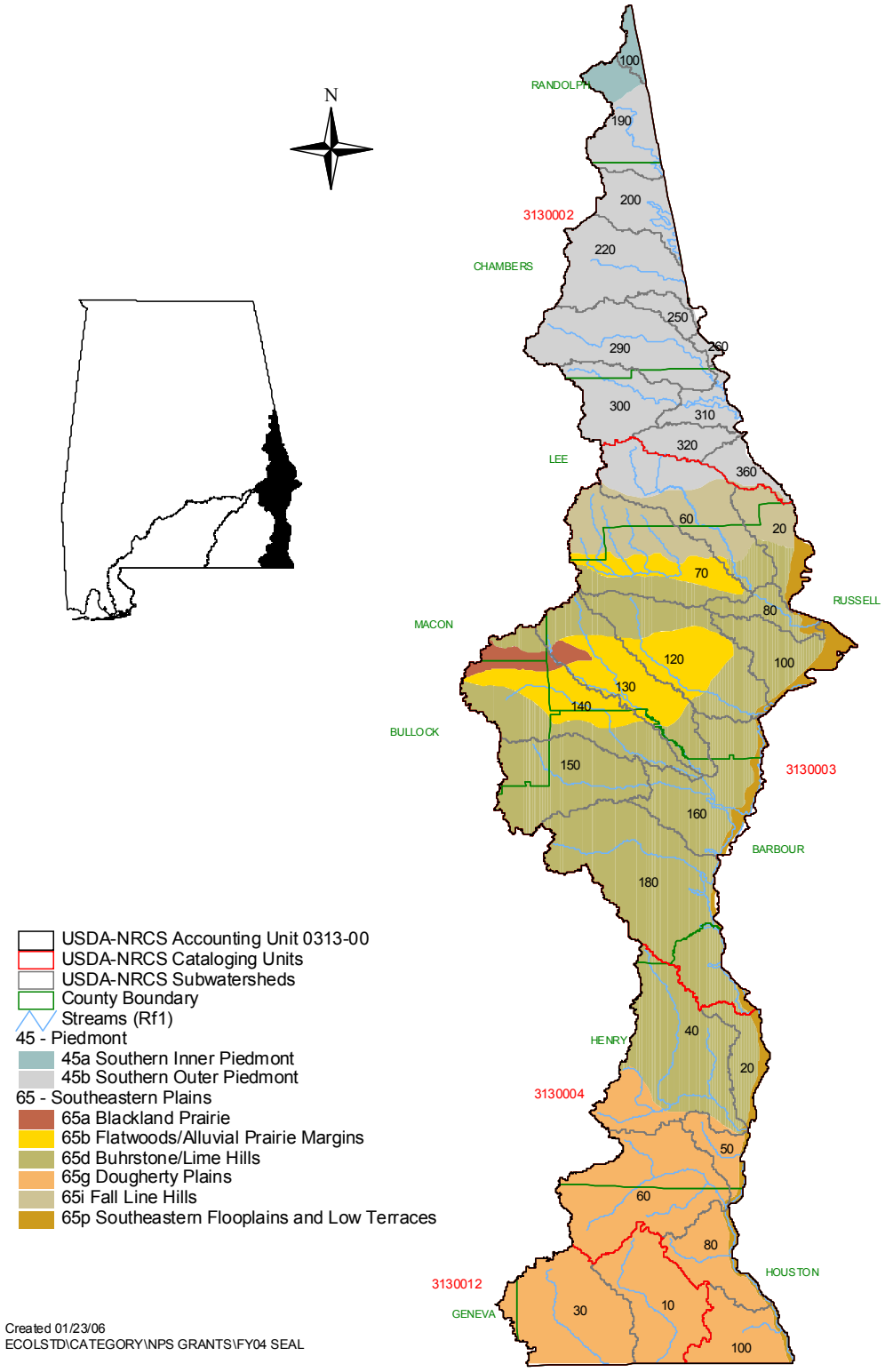


Fig. 6. Level III and IV Sub-Ecoregions of the Choctawhatchee and Pea River Basins.

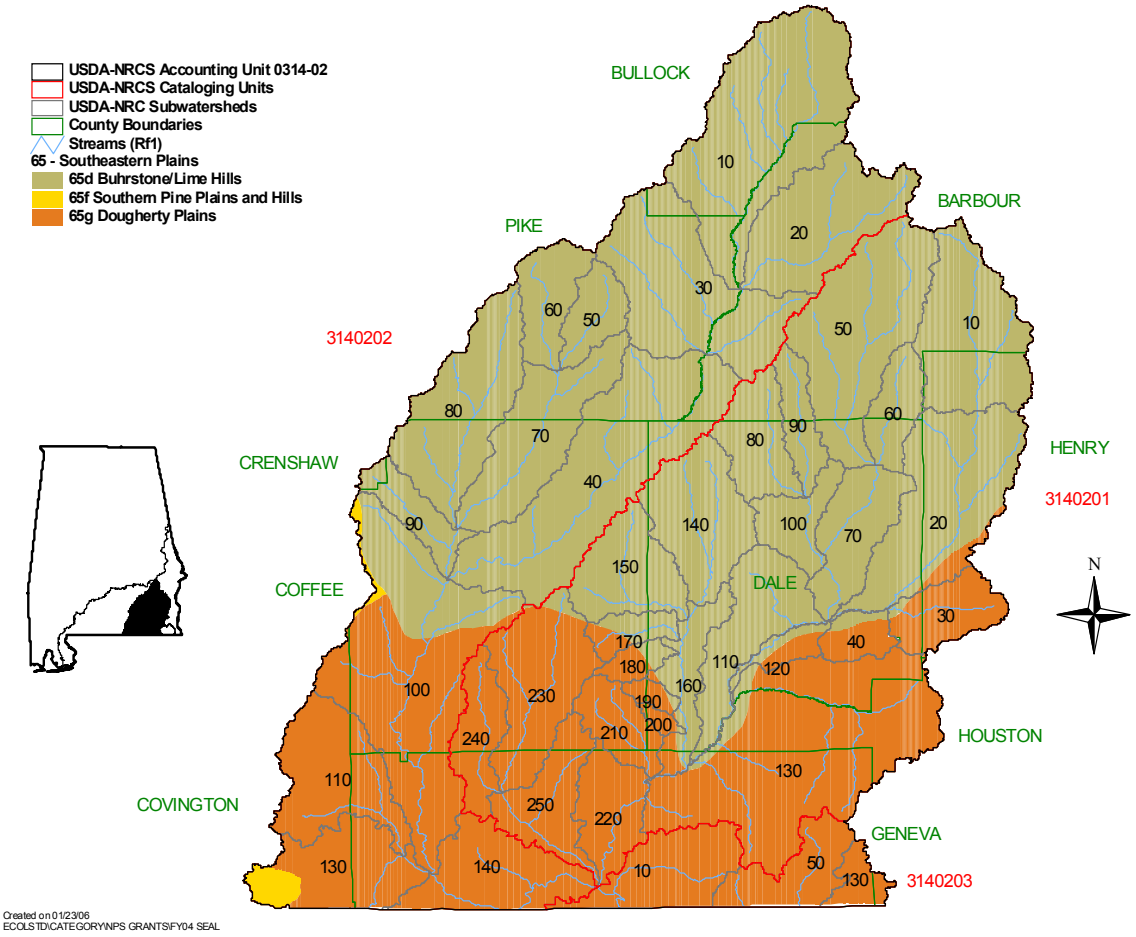


Fig. 7. Level III and IV Sub-Ecoregions of the Escambia River Basin.

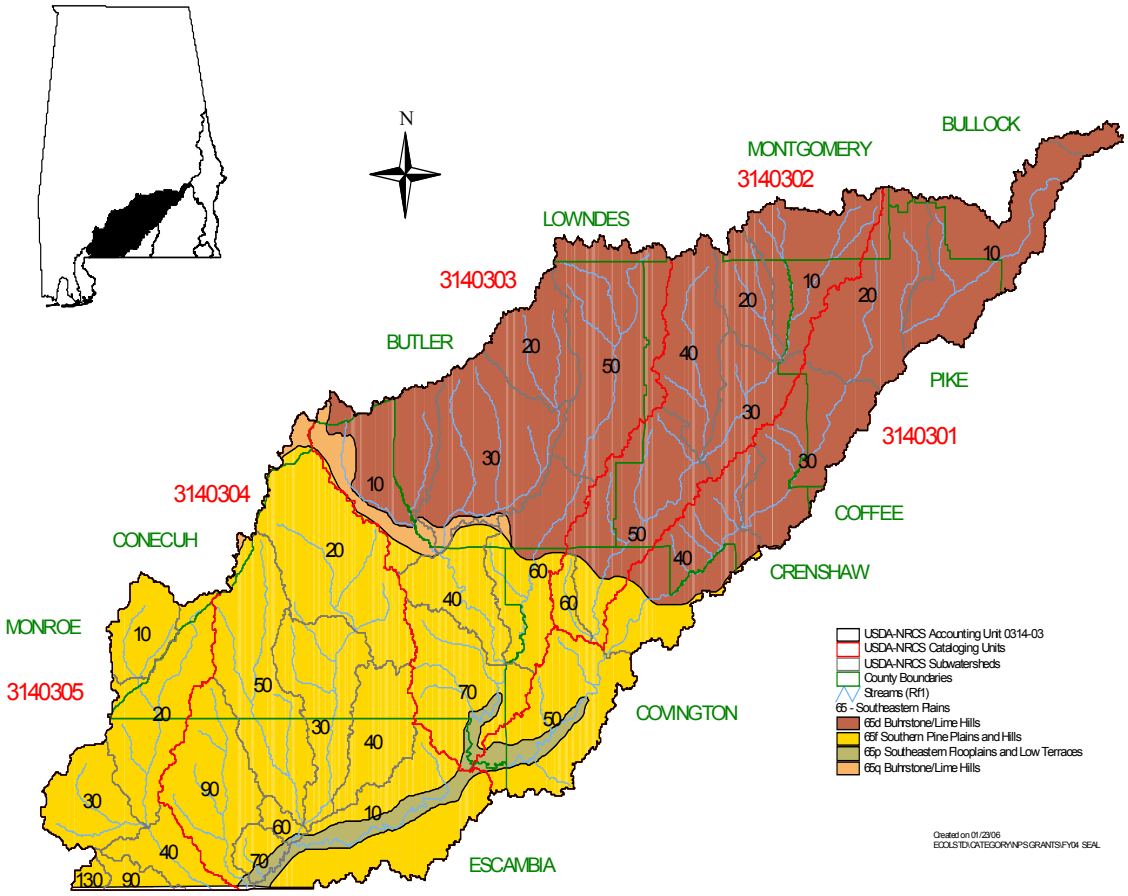
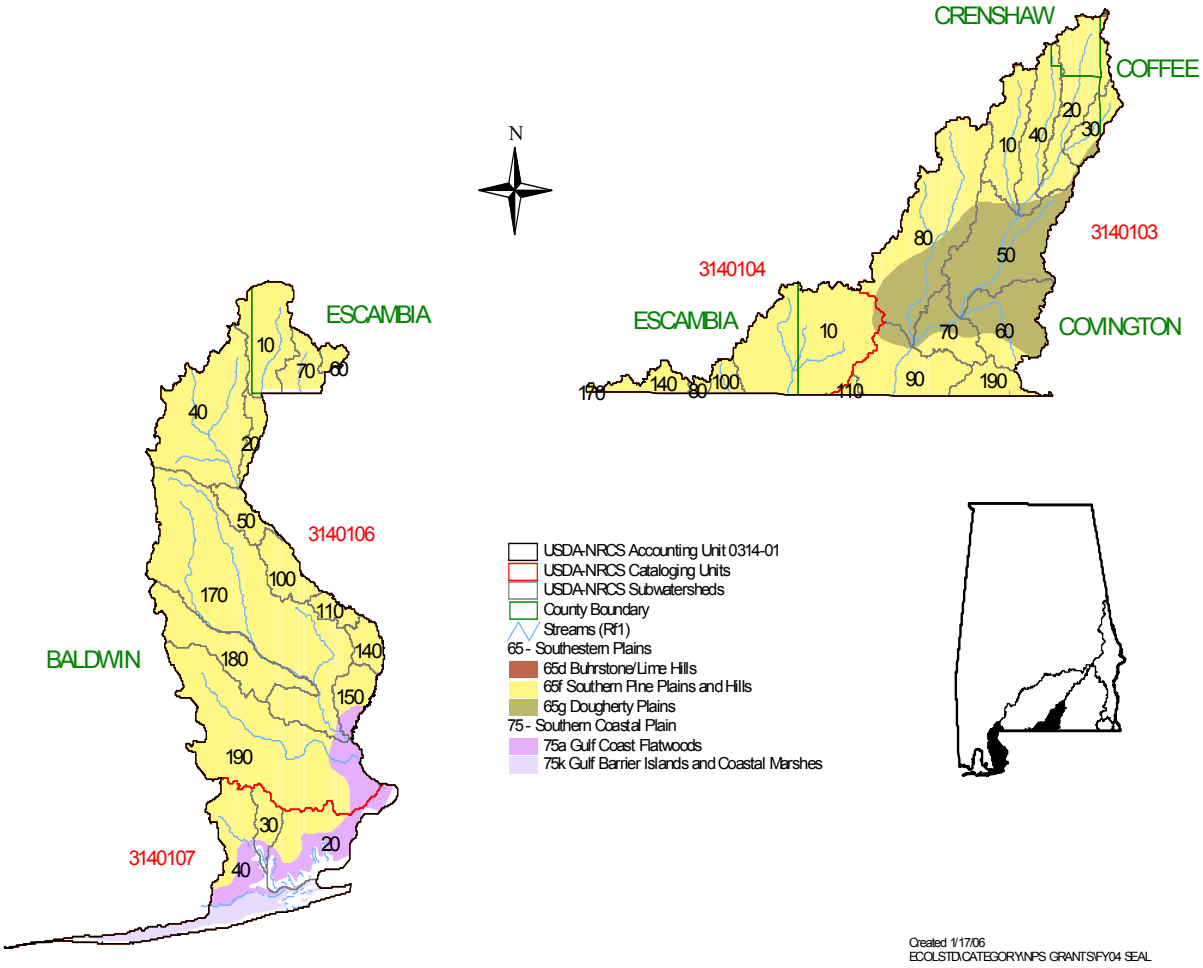


Fig. 8. Level III and IV Sub-Ecoregions of the Perdido River Basin



SUB-WATERSHED SELECTION CRITERIA

The use of available data was an important component of the NPS screening assessment of the SE AL Basins because it allowed ADEM to concentrate efforts in those areas where recent data were not available and in those areas at most risk to impairment from NPS sources.

To prioritize sub-watersheds for assessment and to evaluate potential sources of impairment, ADEM assigned each sub-watershed an NPS rating based on estimates of landuse percentages, animal populations, and sedimentation rates. These NPS ratings give an indication of overall potential for impairment within the sub-watershed, but are not specific to any one station. These estimates were obtained from information provided to ADEM by the Alabama Soil and Water Conservation Committee (ASWCC) and local Soil and Water Conservation Districts (SWCD). Sub-watershed assessment information and NPS impairment potentials were reported by ADEM in the 1999 SE AL Basin Assessment Reports. Sub-watershed assessment information is available at *www.swcc.state.al.us*.

Additional selection criteria included (a) §303(d)-listed waterbodies within the sub-watershed; (b) sub-watersheds identified as priority by the local SWCD or by the SE AL Clean Water Partnership stakeholders; (c) sub-watersheds not assessed during 1999; and, (d) sub-watersheds with drainages $\geq$ 5 square miles.

Prior to 2004, ADEM's Basinwide NPS Screening Assessment Program was conducted to assess sub-watersheds affected primarily by rural nonpoint sources. For this reason, sub-watersheds assessed in 1999 had minimal impacts from urban sources. However, watershed plans supported by §319 grant funding must now also account for urban sources of impairment. ADEM's 2004 basinwide screening assessments therefore addressed both point and nonpoint sources.

SITE SELECTION

Potential sites were selected within each target sub-watershed. Each potential site was visited during March and April to ensure that it was wadeable, accessible, and flowing. Where possible, assessment sites were located in relatively small drainages to relate water quality to specific nonpoint sources and to compare results to ADEM's network of least impacted reference sites.

HABITAT ASSESSMENT

In the absence of water quality impairment, the biological condition of fish and aquatic macroinvertebrate communities is generally correlated with the quality of available habitat. The presence of stable and diverse habitat generally supports a diverse and healthy aquatic fauna (Barbour and Stribling 1991, Barbour and Stribling 1994). Therefore, habitat quality was assessed at each site to evaluate stream condition and to assist in the interpretation of biological data. Primary, secondary, and tertiary habitat parameters were evaluated. Primary habitat parameters evaluate the availability and quality of substrate and instream cover. They include those characteristics that directly support aquatic communities, such as substrate type, stability, and availability. Secondary habitat parameters evaluate channel morphology, which is determined by flow regime, local geology, land surface

form, soil, and human activities. Channel morphology indirectly affects the biological communities by affecting sediment movement through a stream (Barbour and Stribling 1991). Secondary habitat parameters include an evaluation of flow regime, sinuosity, instream geomorphology, and sediment deposition and scouring. Tertiary habitat characteristics evaluate bank structure and riparian vegetation. Bank and riparian vegetation prevent bank erosion and protect the stream from stormwater runoff from impervious surfaces. The presence of overhanging riparian vegetation also determines the primary energy source for aquatic macroinvertebrate communities—the base of the fish food chain (Vannote et al. 1980). Tertiary parameters include bank condition, bank vegetative protection, and riparian zone width.

The EPA has published two versions of stream habitat assessment forms to evaluate primary, secondary, and tertiary habitat parameters (Plafkin et al. 1989, Barbour et al. 1999). ADEM used the original habitat assessment form from 1989 through 1996. The EPA published revised habitat assessment forms that evaluated riffle/run and glide/pool streams separately (EPA 1997b). The primary habitat parameters of the glide/pool habitat assessment emphasize characteristics important to this stream-type, primarily pool structure and variability. The ADEM began using the revised forms in 1996 because they assess habitat quality and degradation to the glide/pool streams of south Alabama more accurately. In addition, because they measure impairment to habitat quality, the scores (converted into percent of maximum score) were comparable between stream types and can be used to evaluate streams throughout the basin.

The habitat assessment forms used by ADEM are provided in Appendices J and K. At each site, two field personnel completed a riffle/run or glide/pool habitat assessment. The scores were averaged to obtain a final habitat assessment score. One physical characterization sheet was filled out at each station. Field data sheets used by ADEM are provided in Appendices M and N.

AQUATIC MACROINVERTEBRATE ASSESSMENT: Wadeable Multi-Habitat EPT Method (WMB-EPT)

An in-depth description of the procedures used during a WMB-EPT assessment can be found in ADEM 2005b. At each station, basic field parameters were measured and a stream flow was estimated using an abbreviated cross-section flow measurement technique of 6-10 measurements (ADEM 2000c). A Global Positioning System (GPS) Unit was used to determine the latitude and longitude of each station (if possible).

The WMB-EPT method is an aquatic macroinvertebrate assessment technique used in watershed screening assessment studies, which entail assessments at multiple sites over a large area. The WMB-EPT decreases collection effort and analysis time by processing the samples in the field and focusing on the collection of the pollution-sensitive Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa. This method was used to prioritize sub-watersheds with the greatest potential for biological impairments caused by rural nonpoint sources. Once priority sub-watersheds are identified, more extensive monitoring efforts are needed to quantify the level of impairment, determine the causes and sources of that impairment, and to document and assess trends in water quality after BMP implementation.

Collect samples from multiple habitats: All available habitats were sampled at each site. Habitats routinely sampled using this method include riffles, leaf packs, rootbanks, snags/logs and rocks, and sand. The productive habitats at a site will differ naturally between streams above and below the Fall Line. Streams located in 65j, below the Fall Line, are usually low gradient, "glide-pool" streams, characterized by sandy substrates, a lack of riffle habitat, and meandering flows. The majority of the SE AL Basin streams fall into the "glide pool" category. However, streams in the SE AL basins located above the Fall Line are generally moderate-to-high gradient, "riffle-run" streams.

Process samples in the field: After each habitat was sampled, the organic material was elutriated from the inorganic material. The inorganic material was visually inspected for organisms (esp. Trichoptera in stone cases). The organic matter was washed down, and large debris was visually inspected and removed.

***Collect pollution-sensitive taxa*:** Representative "EPT" organisms were removed from the sample and preserved in a pre-labeled vial by habitat. The vials for each station were returned to the lab in a Nalgene container labeled with the station number, date and time collected, the names of the habitats collected at the station, and the initials of the team member who processed the sample. The organisms were identified to family level in the laboratory.

Field QA/QC procedures: At 10% of the field-picked stations, the debris remaining from each habitat was preserved in wide-mouth containers and returned to the laboratory to verify the removal of all EPT taxa and calculate the accuracy of the field-pick method.

Laboratory QA/QC procedures: Laboratory identifications for 10% of macroinvertebrate samples were verified by a second qualified biologist. All data entered in the aquatic macroinvertebrate mainframe Pace database are verified for accuracy.

Data analysis: The total number of pollution-sensitive EPT families collected from each station was compared to EPT Index data collected from least-impaired ecoregional reference reaches to evaluate the health of each stream reach. Each site was assessed as *excellent*, *good*, *fair*, or *poor* based on the number of pollution-sensitive EPT families collected (ADEM 2004a).

FISH IBI MULTI-HABITAT ASSESSMENT

Site Selection: Generally, Fish IBI assessments are conducted at study stations if impairment from sedimentation or habitat degradation is suspected or if the aquatic macroinvertebrate assessment is inconclusive.

Sample collection: The fish IBI assessment methods summarized here are described in more detail in O'Neil and Sheppard (1998). They have been incorporated into ADEM's Fish Community Assessment standard operating procedure manual. Additional information pertaining to metrics testing and criteria development is included in these sources.

At each station, one three-person team conducts a timed, multi-habitat assessment of the fish community, sampling all available habitats, including riffles, pools, runs, snags, and undercut banks. Small streams are generally sampled for 30 minutes while larger

streams are sampled for 1 hour. Nylon minnow seines (1/8 to 3/16-inch-mesh) and a portable backpack shocking unit are used to sample all habitat areas.

In the field, collected specimens are fixed in 10 to 20% formalin and preserved in 70% alcohol. A field sheet is completed at each site. In the laboratory, specimens are identified to species, measured, and weighed to the nearest gram. Results are converted into the number of fish collected per hour to calculate indices of biotic integrity.

CHEMICAL SAMPLING

Table 2 lists the analysis method and detection limits for parameters analyzed by ADEM in conjunction with its monitoring programs. ADEM's 2005 draft Listing and Assessment Methodology states that at least three water quality sampling events must be conducted to fully assess a waterbody. During the screening assessment of the SE AL Basins, chemical parameters were collected one time and used as indicators of NPS impairment including sedimentation (total suspended solids, total dissolved solids), nutrient enrichment (total phosphorus, nitrate/nitrite-nitrogen, CBOD-5), and mining impacts (total iron, total manganese).

Routine field parameters were collected at all NPS sites in conjunction with habitat and macroinvertebrate assessments. Water Quality samples were collected during the critical period July-August.

Duplicate field parameters were collected during 10% of the sampling events. Duplicate water quality samples were collected during 5% of the sampling events.

Chemical analyses of water samples were conducted by ADEM's Central Laboratory in Montgomery. Water quality samples for laboratory analysis were collected, preserved, and transported to ADEM's Laboratory as described in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volume I - Physical/Chemical (ADEM 2000c). Laboratory analyses were conducted in accordance with ADEM's Quality Assurance Manual for the Alabama Department of Environmental Management Central Laboratory (ADEM 1999d).

CHAIN OF CUSTODY

Sample handling and chain-of-custody procedures were used for all biological and chemical samples as outlined in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volumes I and II to ensure the integrity of all samples collected (ADEM 1999a, 2000c).

Table 2. List of parameters analyzed by ADEM. Analysis method, reference, and detection limit are also listed.

Parameter	*Method*	*Reference*	*Detection Limit*
Air Temperature	Thermometer	ADEM SOP Vol. 1	1°C
Water Temperature	Thermometer/Thermistor	ADEM SOP Vol. 1	1°C
Dissolved Oxygen	Modified Winkler Membrane Electrode	ADEM SOP Vol. 1	0.1 mg/L
pH	Glass Electrode	ADEM SOP Vol. 1	0.1 su
Specific Conductance	Wheatstone Bridge	ADEM SOP Vol. 1	10 µmhos/cm @ 25°C
Turbidity	Nephelometer	APHA et al. 1998	0.1 NTU
Stream Flow	Modified Cross Sectional	ADEM SOP Vol. 1	0.1 cfs
5-day Biochemical Oxygen Demand (BOD-5)	EPA 405.1	EPA/600/4-79/020	0.1 mg/L
Alkalinity (Alk)	EPA 310.1	EPA/600/4-79/020	1 mg/L
Aluminum, Total (Al)	EPA 200.7	EPA/600/R-94/111	0.2 mg/L
Ammonia-nitrogen (NH_3-N)	EPA 350.1	EPA/600/R-93/100	0.015 mg/L
Arsenic, Total (As)	EPA 206.2	EPA/600/4-79/020	10 µg/L
Cadmium, Total (Cd)	EPA 200.7	EPA/600/R-94/111	0.003 mg/L
Carbonaceous BOD-5 (CBOD-5)	EPA 405.1	EPA/600/4-79/020	0.1 mg/L
Chloride (Cl)	EPA 300.A EPA 325.1	EPA/600/R-93/100 EPA/600/4-79/020	0.5 mg/L
Chlorophyll a (Chlor a)	SM 10200H	APHA et al. 1992	0.1 mg/m^3
Chromium, Total (Cr-T)	EPA 200.7	EPA/600/R-94/111	0.015 mg/L
Copper, Total (Cu)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Fecal Coliform	Membrane Filter	ADEM SOP Vol. 6	---
Hardness	EPA 130.2 / SM2340B	EPA/600/4-79/020	1 mg/L
Hexavalent Chromium (Cr^{+6})	SM 3500CrB	APHA et al. 1998	0.02 mg/L
Iron, Total (Fe)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Lead, Total (Pb)	EPA 239.2	EPA/600/4-79/020	2 µg/L
Magnesium, Total (Mg)	EPA 200.7 EPA 242.1	EPA/600/R-94/111 EPA/600/4-79/020	0.05 mg/L
Manganese, Total (Mn)	EPA 200.7	EPA/600/R-94/111	0.02 mg/L
Mercury, Total (Hg)	EPA 245.2 EPA 245.5	EPA/600/4-79/020 EPA/600/4-91/010	0.3 µg/L
Nickel, Total (Ni)	EPA 200.7	EPA/600/R-94/111	0.03 mg/L
Nitrate/nitrite-nitrogen (NO_3+NO_2-N)	EPA 353.2	EPA/600/R-93/100	0.003 mg/L
Organochlorine Pesticides	SW 8081A	EPA 1994	---
Organophosphorus Pesticides	SW 8141	EPA 1994	---
Ortho-Phosphorus (Ortho-P)	EPA 365.3	EPA/600/4-79/020	0.004 mg/L
Selenium, Total (Se)	EPA 270.2	EPA/600/4-79/020	10 µg/L
Silver, Total (Ag)	EPA 200.7	EPA/600/R-94/111	0.01 mg/L
Total Dissolved Solids (TDS)	EPA 160.1	EPA/600/4-79/020	1 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	EPA/600/R-93/100	0.15 mg/L
Total Organic Carbon (TOC)	EPA 415.2		0.5 mg/L
Total Organic Nitrogen (TON)	TKN+NH_3	EPA 1994	Calculated value
Total Phosphorus (Total P)	EPA 365.4	EPA/600/4-79/020	0.004 mg/L
Total Suspended Solids (TSS)	EPA 160.2	EPA/600/4-79/020	1 mg/L
Zinc, Total (Zn)	EPA 200.7	EPA/600/R-94/111	0.03 mg/L
Zinc, Dissolved (Dis-Zn)	EPA 289.2	EPA/600/4-79/020	0.03 mg/L

THIS PAGE INTENTIONALLY BLANK

2004 SE AL NPS SCREENING ASSESSMENT RESULTS

SELECTION OF TARGET SUB-WATERSHEDS

A total 39 sub-watersheds were selected for screening level assessments during 2004 (Appendices A and B). These included one §303(d) listed stream, 8 streams identified as NPS priorities during 1999, 30 sub-watersheds with moderate or high potentials for NPS impairment, and 15 water bodies identified as priorities by the SE AL CWP. Six streams identified as CWP priorities were located in sub-watersheds with drainage areas smaller than are generally assessed during basinwide screening assessments ($<5mi^2$) and could not be assessed during this project. The priority sub-watersheds are listed in Table 3.

SITE SELECTION

One hundred and twenty-nine candidate sites were visited to identify the best sites for screening level assessments. A total of 62 stations in 35 sub-watersheds were selected for assessment (Appendix A). The stations dropped during reconnaissance site visits are listed in Appendix B. Station descriptions are provided in Appendix C.

SITE ASSESSMENTS

Basinwide screening assessments were attempted at 73 sites throughout the basins. Eleven of these sites were not wadeable or not flowing during ADEM's established macroinvertebrate sampling period (late April – early July) and could not be assessed (Appendix A). Basinwide screening assessments including habitat, macroinvertebrate, and water quality sampling were conducted at the remaining 62 sites.

Habitat Assessments: Habitat assessment results are summarized by basin in Appendices D-F. Habitat conditions at 57 (92%) sites were rated as *excellent* or *good* based on ADEM's ecoregional reference data. Habitat conditions at five sites were rated as *fair* (Appendix I).

Macroinvertebrate Assessments: Macroinvertebrate assessment results are summarized in Appendices D-F. The screening-level macroinvertebrate assessment rated the macroinvertebrate community as *fair* at 37 (60%) sites, and *poor* at 8 (13%) sites (Appendix I).

Fish IBI Assesssments: Fish community assessments were planned for 24 sites with suspected sedimentation impacts. However, effects from Hurricane Ivan resulted in drastic habitat alterations such that the fish IBI assessments were cancelled.

In situ measurements and chemical sampling: Routine in situ parameters and stream flows measured at the time of the macroinvertebrate and habitat assessments are provided by basin in Appendices D, E, and F. Results of water samples collected during the critical period of July–August are summarized in Appendices D-H. A second water quality sampling event scheduled for September was cancelled due to Hurricane Ivan.

Fig. 9. Habitat and Macroinvertebrate Assessments Conducted in the Chattahoochee and Chipola River Basins

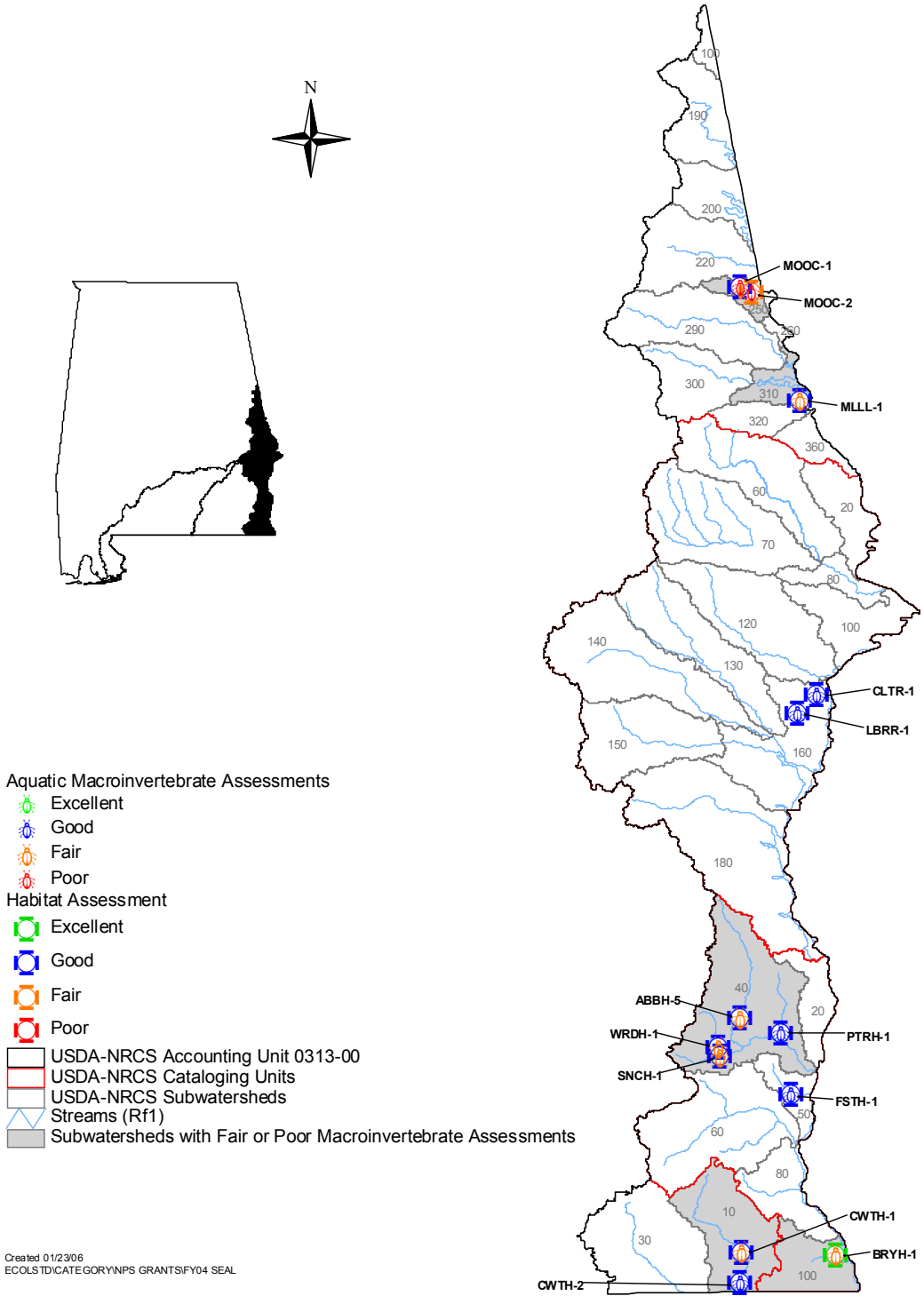


Fig. 10. Habitat and Macroinvertebrate Assessments Conducted in the Choctawhatchee and Pea River Basins

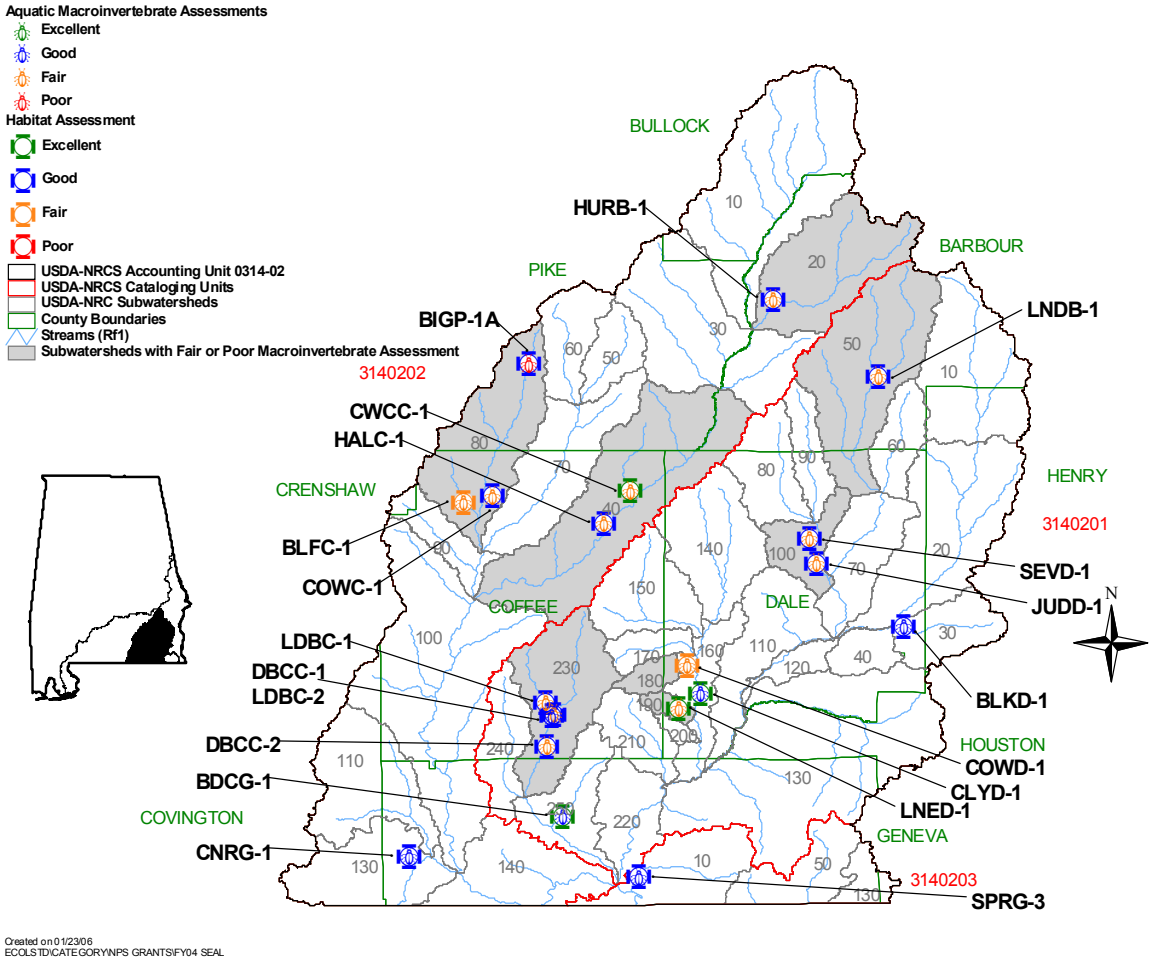


Fig. 11. Habitat and Macroinvertebrate Assessments Conducted in the Escambia River Basin

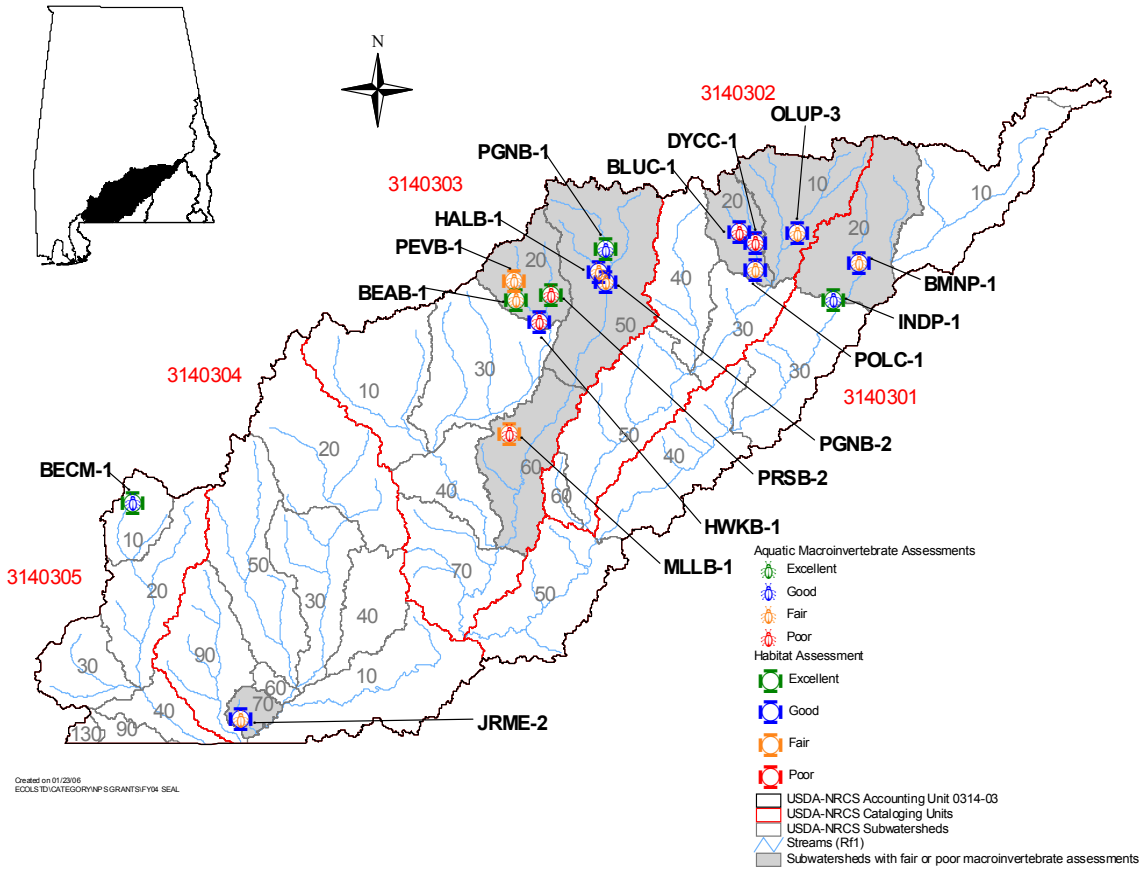
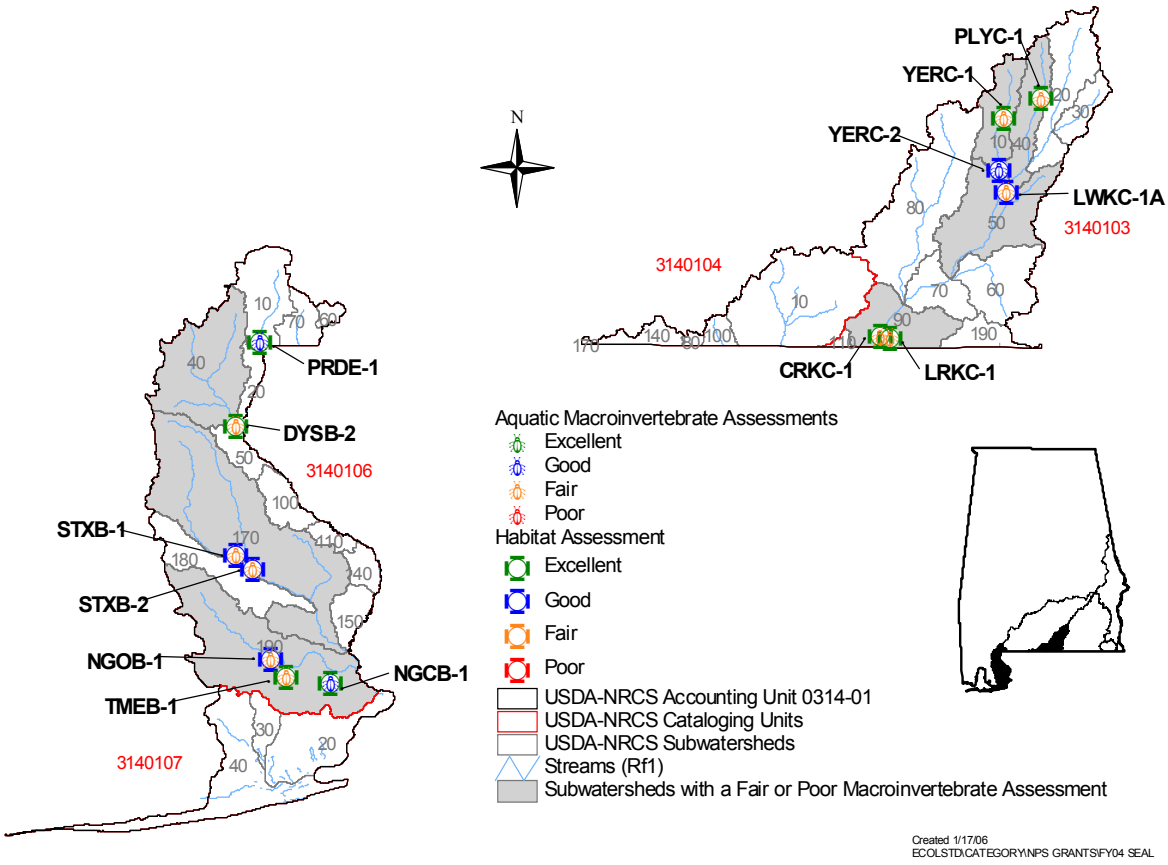


Fig. 12. Habitat and Macroinvertebrate Assessments Conducted in the Perdido River Basin



2004 NPS Priority Sub-watersheds: A total of 62 WMB-EPT screening assessments (stations) were completed in 34 sub-watersheds in the SE AL basins (Appendices D-I). Based on the lowest macroinvertebrate assessment result at any station within a sub-watershed, a total of 21 (62%) sub-watersheds were assessed as *fair*, and 4 (12%) sub-watersheds were assessed as *poor* (Appendix D-F, and I). The sub-watersheds assessed as *poor* were Moores Cr. in the Middle Chattahoochee –Lake Harding CU, Big Cr. in the Pea River CU, Blue Cr. in the Patsaliga River CU, and Upper Persimmon Cr. in the Sepulga River CU (see Fig. 9, 10, 11, and 12).

SE AL NPS PRIORITY SUB-WATERSHEDS LIST

The 2004 SE AL NPS Screening Assessments have closed the data gaps in those basins by covering previously unassessed sub-watersheds. In total, 66 of the 137 SE AL Basin sub-watersheds were sampled during the 1999 and 2004 Basinwide screening assessment projects. Thirty-five of these received macroinvertebrate screening assessments of fair or poor and were identified as priorities (Table 3). A short summary of assessment results within each of the priority sub-watersheds follows. For each 11-digit HUC in the basins the 1999 SE AL reports contain landuse descriptions, estimated NPS impairment potential, and a summary of assessment conditions through 2002.

The information assembled in this report may be used by ADEM's Water Quality Branch to support listing and delisting of stream segments on the §303(d) list of impaired waterbodies and by the ADEM NPS Unit to assist with the development of NPS watershed plans. By 2008, additional monitoring will be conducted within each NPS priority sub-watershed to fully assess waters according to Alabama's Listing and Assessment methodology. Water bodies that do not meet their water use classification criteria will be listed as impaired and may be eligible for §319 funding. Additional monitoring will be conducted in the following order: 1) sites that received a macroinvertebrate assessment of *poor*; 2) sites that received a macroinvertebrate assessment of *fair*; and 3) sites that received a fish assessment of *poor* or *very poor*.

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
1999	0313	0002	190	Wedhadkee Cr.		WECR-1	Excellent	Good	Fair	Animal husbandry, pasture runoff
1999	0313	0002	190	Wedhadkee Cr.		WECR-2	Excellent	Good	Fair	Animal husbandry, pasture runoff
1999	0313	0002	220	Barrow Cr.		BWCC-1	Good	Fair		Unknown
1999	0313	0002	220	Well Cr.		WLCC-1	Good	Fair		Unknown
2004	0313	0002	250	Moores Cr.		MOOC-2	Fair	Poor		Urban, Development, Sedimentation, Forestry Pasture Runoff
2004	0313	0002	250	Moores Cr.		MOOC-1	Good	Poor		Urban, Development, Sedimentation, Forestry Pasture Runoff
2004	0313	0002	310	Mill Cr.		MLLL-1	Good	Fair		Sedimentation, Failing Septic Tanks
1999	0313	0003	060	L. Uchee Cr.		LUC-3	Excellent	Fair		Cropland runoff, agriculture
1999	0313	0003	100	Ihagee Cr.		IHGR-1	Excellent	Good	Poor	Pasture runoff
1999	0313	0003	120	Hatchechubbee Cr.		HECR-2	Good	Fair		Pasture runoff
1999	0313	0003	180	Barbour Cr.	303(d)	BRC-2	Good	Fair		Siltation from Agriculture
1999	0313	0004	020	Bennett Mill Cr.		BMCH-1	Excellent	Fair	Poor	Cropland runoff, pasture runoff, silviculture
1999	0313	0004	020	McRae Cr.		MMCH-1	Excellent	Fair		Cropland runoff, pasture runoff, silviculture
2004	0313	0004	040	Abbie Cr.		ABBH-5	Good	Fair		Mining, Sedimentation, Forestry, Row Crops
2004	0313	0004	040	Sandy Cr.		SNCH-1	Good	Fair		Mining, Sedimentation, Forestry, Row Crops
2004	0313	0004	040	Ward Cr.		WRDH-1	Good	Fair		Mining, Sedimentation, Forestry, Row Crops
2004	0313	0004	100	Bryans Cr.		BRYH-1	Excellent	Fair		Pasture Runoff, Animal Husbandry, Aquaculture, Row Crops, Urban
2004	0313	0012	010	Cowarts Cr.		CWTH-1	Good	Fair		Animal Husbandry, Aquaculture, Row Crops, Pasture Runoff, Urban
2004	0314	0103	010	Yellow R.		YERC-1	Excellent	Fair		Pasture Runoff,, Animal Husbandry

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
2004	0314	0103	040	Poley Cr.		PLYC-1	Excellent	Fair		Pasture Runoff, Animal Husbandry
2004	0314	0103	040	Lightwood Knot Cr.		LWKC-1A	Good	Fair		Pasture Runoff, Animal Husbandry
1999	0314	0103	050	Poplar Cr.		PRCC-1	Excellent	Fair	Fair	Animal husbandry, pasture runoff
2004	0314	0103	090	Crooked Cr.		CRKC-1	Excellent	Fair		Pasture Runoff, Animal Husbandry
2004	0314	0103	090	Larkin Cr.		LRKC-1	Excellent	Fair		Pasture Runoff, Animal Husbandry
2004	0314	0106	040	Dyas Cr.		DYSB-2	Excellent	Fair		Forestry, Urban, Development
2004	0314	0106	170	Styx R.	303(d)	STXB-1	Good	Fair		Mercury from Unknown Sources
2004	0314	0106	170	Styx R.	303(d)	STXB-2	Good	Fair		Mercury from Unknown Sources
2004	0314	0106	190	Three Mile Cr.		TMEB-1	Excellent	Fair		Develop., Row Crops, Forestry, Sedimentation,
2004	0314	0106	190	Negro Cr.		NGOB-1	Good	Fair		Development, Row Crops, Forestry, Sedimentation, Urban,
1999	0314	0201	020	Seabes Cr.		SSCD-1	Good	Fair	Fair	Animal production operations, Sedimentation
1999	0314	0201	020	Deal Cr.		DLCH-1	Excellent	Fair	Very poor	Animal production operations, Sedimentation
1999	0314	0201	020	Jack Cr.		JKCH-1	Excellent	Poor	Poor	Animal production operations, Sedimentation
1999	0314	0201	020	Panther Cr.		PRCH-1	Excellent	Poor	Poor	Animal production operations, Sedimentation
2004	0314	0201	050	Lindsey Cr.		LNDB-1	Good	Fair		Animal Husbandry, Aquaculture, Row Crops, Pasture Runoff
1999	0314	0201	070	Big Cr.		BGCD-1	Excellent	Fair	Fair	Animal production operations, Mining
1999	0314	0201	070	Middle Cr.		MECD-1	Excellent	Fair		Animal production operations, Mining
1999	0314	0201	070	Walnut Cr.		WTCD-1	Excellent	Good	Fair	Animal production operations, Mining

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
1999	0314	0201	080	Judy Cr.		JDYD-2	Excellent	Fair	Poor	Animal production operations, Mining
1999	0314	0201	080	Blacks Cr.		BLCD-1	Excellent	Poor	Fair	Animal production operations, Mining
1999	0314	0201	100	Judy Cr.		JDYD-1	Good	Poor	Poor	Animal production operations
2004	0314	0201	100	Judy Cr		JUDD-1	Good	Fair		Animal Husbandry, Urban, Aquaculture, Row Crops, Pasture Runoff
2004	0314	0201	100	Sevenmile Cr.		SEVD-1	Good	Fair		Animal Husbandry, Urban, Aquaculture, Row Crops, Pasture Runoff
1999	0314	0201	130	Beaver Cr.	303(d)	BVC-2	Excellent	Poor		Nutrients, Organic Enrichment / Dissolved Oxygen Sources: Municipal, Urban Runoff / Storm Sewers,
1999	0314	0201	170	Harrand Cr.		HDC-1	Excellent	Fair		Unknown NPS, Point Source
1999	0314	0201	170	Harrand Cr.		HDC-2	Excellent	Poor		Unknown NPS, Point Source
1999	0314	0201	170	UT Harrand Cr.		UTCH-1	Poor	Poor		Unknown NPS, Point Source
2004	0314	0201	180	Cowpen Cr.		COWD-1	Fair	Fair		Row Crops, Sedimentation, Urban
2004	0314	0201	190	Line Cr.		LNED-1	Excellent	Fair		Animal Husbandry, Aquaculture, Pasture Runoff, Urban, Sedimentation, Row Crops
1999	0314	0201	220	Adams Cr.		ASCG-1	Good	Fair		Row Crops
2004	0314	0201	230	Double Bridges Cr.		DBCC-1	Good	Fair		Animal Husbandry, Row Crops, Pasture Runoff, Sedimentation, Urban, Development
2004	0314	0201	230	Double Bridges Cr.		DBCC 2	Good	Fair		Animal Husbandry, Row Crops, Pasture Runoff, Sedimentation, Urban, Development
2004	0314	0201	230	L. Double Bridges Cr.		LDBC-1	Good	Fair		Animal Husbandry, Row Crops, Pasture Runoff, Sedimentation, Urban, Development

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
1999	0314	0202	010	Big Sandy Cr.		BSCB-1	Excellent	Fair		Unknown
1999	0314	0202	010	Johnson Cr.		JHCB-1	Good	Fair		Unknown
1999	0314	0202	010	Dry Cr.		DRYB-1	Excellent	Poor	Poor	Unknown
2004	0314	0202	020	Hurricane Cr.		HURB-1	Good	Fair		Aquaculture, Animal Husbandry, Row Crops, Pasture Runoff
1999	0314	0202	040	Clearwater Cr.		CLWC-1		Fair	Fair	Unknown
2004	0314	0202	040	Clearwater Cr.		CWCC-1	Excellent	Fair		Animal Husbandry, Aquaculture, Row Crops, Pasture Runoff, Forestry, Sedimentation, Development
2004	0314	0202	040	Halls Cr.		HALC-1	Good	Fair		Animal Husbandry, Aquaculture, Row Crops, Pasture Runoff, Forestry, Sedimentation, Development
1999	0314	0202	070	Whitewater Cr.		WWCC-2	Excellent	Good	Fair	Mining
1999	0314	0202	070	Whitewater Cr.		WWCC-3	Excellent	Good	Fair	Mining
1999	0314	0202	080	Cowpen Cr		UTBC-2	Excellent	Fair		Mining
2004	0314	0202	080	Bluff Cr.		BLFC-1	Fair	Fair		Mining, Animal Husbandry, Row Crops, Pasture Runoff, Forestry, Sedimentation, Development
2004	0314	0202	080	Cowpen Cr.		COWC-1	Good	Fair		Mining, Animal Husbandry, Row Crops, Pasture Runoff, Forestry, Sedimentation, Development
2004	0314	0202	080	Big Cr.		BIGP-1A	Good	Poor		Mining, Animal Husbandry, Row Crops, Pasture Runoff, Forestry, Sedimentation, Development

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
1999	0314	0202	100	Patrick Cr.		PATC-1	Excellent	Fair	Poor	Animal production operations, Sedimentation
1999	0314	0203	130	Holmes Cr.		HSCG-1	Excellent	Good	Fair	Aquaculture Operations, Row Crops
2004	0314	0301	020	Beeman Cr.		BMNP-1	Good	Fair		Pasture Runoff, Forestry, Sedimentation, Development
2004	0314	0302	010	Olustee Cr.		OLUP-3	Good	Fair		Animal Husbandry, Pasture Runoff
2004	0314	0302	020	Poley Cr.		POLC-1	Good	Fair		Animal Husbandry, Pasture Runoff, Forestry
2004	0314	0302	020	Blue Cr.		BLUC-1	Good	Poor		Animal Husbandry, Pasture Runoff, Forestry
2004	0314	0302	020	Dry Cr.		DYCC-1	Good	Poor		Animal Husbandry, Pasture Runoff, Forestry
1999	0314	0302	030	Pond Cr.		PDCC-1	Excellent	Fair	Poor	Animal husbandry, silviculture, pasture runoff
1999	0314	0302	040	L. Patsaliga Cr.		LPCC-4	Good	Fair	Poor	Animal husbandry, silviculture, pasture runoff
1999	0314	0302	040	Cane Cr.		CECC-1	Excellent	Fair		Animal husbandry, silviculture, pasture runoff
1999	0314	0302	050	Piney Woods Cr.		PYW-1	Excellent	Fair	Fair	Silviculture, pasture runoff
1999	0314	0302	050	UT Patsaliga Cr.		UPCC-1	Good	Fair	Fair	Silviculture, pasture runoff
2004	0314	0303	020	Beaver Cr.		BEAB-1	Excellent	Fair		Urban, Development, Animal Husbandry, Pasture Runoff
2004	0314	0303	020	Peavy Cr.		PEVB-1	Fair	Fair		Urban, Development, Animal Husbandry, Pasture Runoff
2004	0314	0303	020	Persimmon Cr.		PRSB-2	Excellent	Poor		Urban, Development, Animal Husbandry, Pasture Runoff
2004	0314	0303	020	Mill Cr.		MLLB-1	Fair	Poor		Urban, Development, Animal Husbandry, Pasture Runoff
2004	0314	0303	020	Hawkins Cr.		HWKB-1	Good	Poor		Urban, Development, Animal Husbandry, Pasture Runoff
2004	0314	0303	050	Halls Cr.		HALB-1	Good	Fair		Development, Animal Husbandry, Pasture Runoff

Table 3. Combined 1999 and 2004 Priority Sub-watersheds (only those that were ranked fair or poor for macroinvertebrates or fish assessments)

Year	11-digit Hydrologic Unit Code (HUC)			Waterbody	303(d)/ TMDL	Station	Screening Assessment Results			NPS ratings of "moderate" or "high" based on 1998 SWCD
							Habitat	*WMB-EPT*	*Fish*	
2004	0314	0303	050	Pigeon Cr.		PGNB-2	Good	Fair		Development, Animal Husbandry, Pasture Runoff
1999	0314	0304	010	Maye Mill Cr.		MMCE-1	Excellent	Fair	Very poor	Aquaculture, Urban development
1999	0314	0304	010	Maye Cr.		MYCE-1	Excellent	Fair		Aquaculture, Urban development
1999	0314	0304	010	Mendan Hall Cr.		MHCE-1	Excellent	Fair		Aquaculture, Urban development
1999	0314	0304	010	Folley Cr.		FYCE-1	Excellent	Poor	Very poor	Aquaculture, Urban development
1999	0314	0304	010	Silas Cr.		SSCE-1	Excellent	Poor	Very poor	Aquaculture, Urban development
2004	0314	0304	070	Jernigan Mill Cr		JRME-2	Good	Fair		Mining, Urban
1999	0314	0304	090	Narrow Gap Cr.		NGCE-1	Excellent	Fair	Poor	Mining
1999	0314	0304	090	L. Escambia Cr.		LEC-1	Excellent	Good		Mining
1999	0314	0305	020	B. Escambia Cr.		BEC-2	Excellent	Fair		Mining
1999	0314	0305	030	Sizemore Cr.		SECE-2	Excellent	Fair	Fair	Crop runoff, mining activities, silviculture
1999	0314	0305	030	Sizemore Cr.		SECE-1	Excellent	Fair		Crop runoff, mining activities, silviculture

SE AL NPS PRIORITY SUB-WATERSHED SUMMARIES

'99 **Wehadkee Cr. (0313-0002-190):** Fish bioassessments conducted at two locations on Wehadkee Cr. rated the site to be in *fair* condition. The potential from impacts from animal concentrations and sedimentation were estimated as relatively *high* within the sub-watershed. Screening level water sampling suggested nutrient enrichment as a potential stressor.

'99 **Oseligee Cr. (0313-0002-220):** Macroinvertebrate assessments conducted at stations on Wells Cr. and Barrows Cr. indicated the communities to be in *fair* condition. The potential for NPS impairment from forestry was estimated to be *moderate*.

'04 **Moores Cr. (0313-0002-250):** Macroinvertebrate assessments conducted at 2 stations (MOOC-1 and MOOC-2) indicated the communities to be in *poor* condition. Habitat was lacking, particularly the rootbank at MOOC-1. The estimated impairment potential from urban sources was *high*. The potential for impairment from forestry and pasture runoff was *moderate*.

'04 **Lower Hallawakee Cr. (0313-0002-310):** The impairment potential from sedimentation was estimated as *high*. The macroinvertebrate community was assessed as *fair.*

'99 **Little Uchee Cr. (0313-0003-060):** Little Uchee Cr. was assessed at 3 locations during 1999. Macroinvertebrate communities were assessed as *fair* at LUC-3. Sedimentation and pasture were NPS concerns within the sub-watershed. There was a *moderate* potential for impairment from urban sources. However, the immediate sub-watershed of Little Uchee Cr. at LUC-1, LUC-2, and LUC-3 was primarily affected by cropland and agricultural land uses.

'99 **Ihagee Cr. (0313-0003-100):** ADEM established a least-impaired ecoregional reference site on Ihagee Cr. in 1995. Results of a fish IBI assessment conducted at the site indicated fish communities to be in *poor* condition. Land use was estimated at 20% pasture and 15% cropland. SWCD estimated a *high* potential for impairment from pasture runoff. Embeddedness and sedimentation have been noted as problems at the site since it has been established.

'99 **Hatchechubbee Cr. (0313-0003-120):** The macroinvertebrate assessment conducted at HECR-2 on Hatchechubbee Cr. rated biological conditions at the site as *fair*. Local SWCD estimates indicated sediment deposition and pasture runoff to be NPS concerns within the sub-watershed. Site observations supported these findings.

'99 **Barbour Cr. (0313-0003-180):** The screening assessment conducted at BRC-2 on Barbour Cr. indicated the macroinvertebrate community to be in *fair* condition. Chemical sampling showed nutrient enrichment to be a potential source of stress at the site. SWCD estimates indicated aquaculture, mining, and sedimentation rates to be NPS concerns

within the sub-watershed. Reconnaissance of sites located on Barbour Cr. indicated silviculture and agricultural land uses to also be prevalent.

'99 **McRae Mill Cr. (0313-0004-020):** McRae Mill Cr. was recommended as a NPS priority sub-watershed due to impaired biological conditions at Bennett Mill Cr. and McRae Mill Cr.. The main NPS concerns within the sub-watershed were runoff from cropland and pastures, forestry, and sedimentation.

'04 **Abbie Cr. (0313-0004-040):** Macroinvertebrate assessments conducted at three stations (ABBH-5, SNCH-1, and WRDH-1) indicated the communities to be in *fair* condition. Potential impacts from sedimentation and mining were estimated *high*. Habitat conditions were assessed as good at all 3 sites.

'04 **Bryans Cr. (0313-0004-100):** Bryans Cr. was assessed at one location BRYH-1 during 2004. The site was selected for assessment because of the estimated potential for impacts from cattle, agriculture, and crop and pasture runoff. Despite excellent habitat conditions, the macroinvertebrate community was rated as *fair*.

'04 **Cowarts Cr. (0313-0012-010):** SWCD estimated moderate potential impacts from animal husbandry, aquaculture, rowcrops, pastures, and urban sources. Macroinvertebrate communities were assessed to be in *fair* condition at CWTH-1.

'04 **Yellow River (0314-0103-010):** The primary nonpoint source concerns within the sub-watershed were animal husbandry and pasture runoff. Macroinvertebrate communities were assessed as *fair* condition at YERC-1.

'04 **Poley Cr. (0314-0103-040):** Screening level macroinvertebrate assessments indicated the community to be in *fair* condition at both PLYC-1 and LWKC-1A. SWCD landuse estimates indicated animal husbandry and pasture runoff to be potential sources of impacts.

'99 **Yellow River (0314-0103-050):** The macroinvertebrate and fish communities of Poplar Cr. at PRCC-1 were both rated as *fair*. SWCD land use estimates indicated animal husbandry, pasture runoff, and sedimentation to be NPS concerns within the sub-watershed.

'04 **Yellow River (0314-0103-090):** Macroinvertebrate assessments were conducted at Crooked Cr. (CRKC-1) and Larkin Cr. (LRKC-1). At both locations the communities were assessed as *fair*. The main SWCD nonpoint source concerns were animal husbandry and pasture runoff.

'04 **Dyas Cr. (0314-0106-040):** Forestry, urban, and development were the main SWCD nonpoint source concerns in this sub-watershed. The macroinvertebrate community of Dyas Cr. at DYSB- 2 was assessed as *fair*.

'04 **Styx River (0314-0106-170):** Macroinvertebrate assessments were conducted at two stations (STXB-1 and STXB-2). Results indicated the communities to be in *fair*

condition. The main SWCD nonpoint source concerns are forestry and urban runoff. Styx River was on the 2002 §303(d) list of impaired waterbodies based on water quality results. Mercury from unknown sources was the constituent of concern.

'04 **Blackwater River (0314-0106-190):** Three Mile Cr. and Negro Cr. were evaluated at TMEB-1 and NGOB-1, respectively. Macroinvertebrate communities were assessed as *fair* at both stations. The SWCD nonpoint source concerns were forestry, row crops, development, urban influences, and sedimentation.

'99 **Lower East Fork Choctawhatchee (0314-0201-020):** Five stream segments within the sub-watershed were assessed in 1999. Four of these stream segments had *poor* to *fair* macroinvertebrate and fish communities. Animal concentrations and sedimentation rates were estimated as moderate within the sub-watershed. Screening level chemical samples suggested the potential for stress from nutrient enrichment.

'04 **Upper West Fork Choctawhatchee (0314-0201-050):** Macroinvertebrate communities were assessed at Lindsey Cr. (LNDB-1) and were found to be in *fair* condition. The SWCD nonpoint source concerns were animal husbandry, aquaculture, row crops, and pasture runoff.

'99 **Lower West Fork Choctawhatchee (0314-0201-070):** Macroinvertebrate and fish assessments conducted at 2 stations indicated the communities to be in *fair* condition. Animal concentrations were estimated as high and the potential for NPS impairment from mining was estimated as high.

'99 **Upper Judy Cr. (0314-0201-080):** Two stations were sampled within this sub-watershed during 1999. Macroinvertebrates in Black Cr. at BLCD-1 and Judy Cr. JDYD-2 were assessed as *poor* and *fair,* respectively. Fish IBI results indicated communities to be in *fair* and *poor* condition, respectively. Animal concentrations were estimated as high and the potential for NPS impairment from mining was estimated to be high.

'99 and '04 **Lower Judy Cr. (0314-0201-100):** Screening level bioassessments have been conducted at Judy Cr. (JDYD-1 and JUDD-1) and at Seven Mile Cr. (SEVD-1). In 1999, the macroinvertebrate community was rated as *poor* at JDYD-1. In 2004, the macroinvertebrate community was rated as *fair* at a second location downstream of JDYD-1. Macroinvertebrates were assessed as *fair* at SEVD-1. SWCD nonpoint source concerns were animal husbandry, urban sources, aquaculture, row crops and pasture runoff.

'04 **Little Choctawhatchee River (0314-0201-130):** Beaver Cr. is on Alabama's §303(d) list for only partially meeting its Fish and Wildlife (F&W) use classification because of nutrients and low dissolved oxygen resulting from municipal discharges and urban runoff. Habitat and macroinvertebrate assessments were conducted at one location on Beaver Cr. (BVC-2) to document current water quality conditions and provide baseline data that can be used to measure changes in water quality after remediation. The stream reach at BVC-2 indicated the macroinvertebrate community to be in *poor* condition. Intensive chemical sampling of 3 locations on Beaver Cr. verified impairments caused by nutrient enrichment.

’99 and ’04 **Harrand Cr. (0314-0201-170):** Habitat and macroinvertebrate assessments were conducted at two stream segments of Harrand Cr. and one tributary of Harrand Cr. while conducting §303(d) stream monitoring to document water quality and biological conditions. All three segments indicated macroinvertebrate communities to be in *fair* or *poor* condition. Intensive chemical sampling indicated pathogens and nutrient enrichment as potential sources of stress.

’04 **Cowpen Cr. (0314-0201-180).** Cowpen Cr. at COWD-1 was one of four stations assessed as *fair* for habitat conditions in 2004. Macroinvertebrates were also assessed as *fair*. Main nonpoint source concerns were row crops, sedimentation and urban sources.

’04 **Line Cr. (0314-0201-190):** Main nonpoint concerns were animal husbandry, aquaculture, pasture runoff , urban influences, sedimentation and row crops. Macroinvertebrates were assessed as *fair*.

’99 **Choctawhatchee River (0314-0201-220):** This sub-watershed had two streams monitored during the NPS Screening Assessment. The stream reach sampled on Adams Cr. (ASCG-1) indicated moderate impairment of the biological conditions. The potential of NPS impairment from cropland was estimated as high.

’04 **Upper Double Bridges Cr. (0314-0201-230):** Macroinvertebrate assessments of Double Bridges Cr. at DBCC-1, DBCC-2, and Little Double Bridges Cr. at LDBC-1 indicated communities to be in *fair* condition. The main SWCD nonpoint source concerns were animal husbandry, row crops, pasture runoff, sedimentation, urban, and development.

’99 **Pea River (0314-0202-010):** Three stations were sampled in this sub-watershed while conducting the NPS Screening Assessment. The stream reach sampled on Dry Cr. (DRYB-1) indicated macroinvertebrate and fish communities to be in *poor* condition. Macroinvertebrates were assessed to be in *fair* condition at Big Sandy Cr. (BSCB-1) and Johnson Cr. (JHCB-1).

’04 **Pea Cr. (0314-0202-020):** A macroinvertebrate assessment conducted at Hurricane Cr. (HURB-1) indicated the community there to be in *fair* condition. The nonpoint source impairment potential from aquaculture was estimated as high.

’98 and ’99 **Buckhorn Cr. (0314-0202-030):** Habitat and macroinvertebrate assessments were conducted on Pea River at PEAB-1 during 1998 and 1999. The macroinvertebrate community was assessed as good in 1998 and *fair* in 1999 the community indicated moderate impairment. Intensive chemical sampling showed pathogens and nutrient enrichment as potential stressors within the sub-watershed.

’98, ‘99, ’04 **Pea River (0314-0202-040):** Results of a 1998 macroinvertebrate assessment on Clearwater Cr. at CLCW-1 indicated the site to be in *fair* biological condition. The potential for impacts from nonpoint sources was estimated as high. The main SWCD concerns were cattle, forestry, agriculture, sedimentation and runoff from crops and pasture lands. Intensive chemical sampling showed pathogens and nutrient enrichment to be potential stressors at the site. Two additional Cr.s were monitored in 2004

(CWCC-1 and HALC-1). The macroinvertebrate community was assessed as *fair* at both locations.

'99 **Whitewater Cr. (0314-0202-070):** Four segments of Whitewater Cr. were monitored in 1999. Screening level macroinvertebrate assessments rated all four sites as good. The sub-watershed was recommended for further monitoring based on fish IBI assessments that rated two sites as *fair*. The potential of nonpoint source impairment from mining was estimated as high. Intensive chemical sampling suggested nutrient enrichment to be a potential source of stress within the sub-watershed.

'04 **Big Cr. (0314-0202-080):** Habitat and macroinvertebrate assessments were conducted at one stream segment of Cowpen Cr. (UTBC-2) in 1999. The macroinvertebrate community was assessed as *fair.* Three additional locations were monitored in 2004 (BLFC-1, COWC-1, and BIGP-1A). Macroinvertebrate assessments at Bluff Cr. and Cowpen Cr. came back as *fair*. At BIGP-1A macroinvertebrates were assessed as *poor*. SWCD nonpoint source concerns within the sub-watershed included cattle, cropland, pasture, mining, forestry, and sedimentation. There was an estimated moderate potential for impairment from urban sources. Intensive chemical sampling suggested pathogens and nutrient enrichment to be potential stressors within the sub-watershed.

'99 **Pea River (0314-0202-100):** Patrick Cr. (PATC-1) has been an ecoregional reference site since 1991. The stream reach was rated as *fair,* based on screening level macroinvertebrate assessment results. The potential for NPS impairment from animal concentrations and sedimentation were estimated as moderate.

'99 **Holmes Cr. (0314-0203-130):** Habitat and biological assessments were conducted on Holmes Cr. at HSCG-1 during the 1999 NPS Screening Assessment. Holmes Cr. was recommended as NPS priority sub-watershed based on a *fair* fish IBI rating. Macroinvertebrates were assessed as good. The potential for nonpoint source impairment from aquaculture and row crop runoff was estimated as high.

'04 **Mannings Cr. (0314-0301-020):** Beeman Cr. at BMNP-1 was assessed during 2004. The macroinvertebrate community was rated as *fair.* The potential for NPS impairment from forestry practices, pasture runoff, sedimentation and development was estimated as moderate.

'04 **Olustee Cr. (0314-0302-010):** Potential for impacts from animal husbandry and pasture runoff was estimated as moderate. Macroinvertebrate communities in Olustee Cr. at OLUP-3 were assessed as *fair.*

'04 **Blue Cr. (0314-0302-020):** Three stations on Blue Cr. (BLUC-1), Dry Cr. (DYCC-1) and Poley Cr. (POLC-1) were monitored in this sub-watershed. Macroinvertebrates at BLUC-1 and DYCC-1 were assessed as *poor*. At POLC-1 macroinvertebrates were assessed as *fair*. Potential NPS impacts from forestry practices were estimated to be high in this sub-watershed.

'99 **Upper Patsaliga Cr. (0314-0302-030):** A screening level macroinvertebrate assessment rated Pond Cr. at PDCC-1 as *fair*. Water quality data showed nutrient enrichment to be a possible cause of impairment. The main NPS concerns in the sub-watershed were animal husbandry, silviculture, and pasture runoff.

'99 **Little Patsaliga Cr. (0314-0302-040):** Biological assessments indicated macroinvertebrates to be in *fair* condition at both Cane Cr. (CECC-1) and Little Patsaliga Cr. (LPCC-1). Habitat assessments completed at LPCC-4 suggested sedimentation to be a possible source of impairment. SWCD estimates indicated animal husbandry, silvicultural activities, and pasture runoff to be NPS concerns within the sub-watershed.

'99 **Lower Patsaliga Cr. (0314-0302-050):** Screening level macroinvertebrate assessments conducted at an unnamed tributary to Patsaliga Cr. (UPCC-1) and at Pineywoods Cr. (PYW-1) indicated both sites to be in *fair* condition. Site visits suggested possible sedimentation problems and SWCD land use information indicated silviculture and pasture runoff to be nonpoint source concerns within the sub-watershed.

'04 **Upper Persimmon Cr. (0314-0303-020):** Macroinvertebrate assessments were conducted at five stations within this sub-watershed. Results indicated *fair* conditions at Beaver Cr. (BEAB-1) and Peavey Cr. (PEVB-1) and *poor* condition at Persimmon Cr. (PRSB-2), Mill Cr. (MLLB-1), and Hawkins Cr. (HWKB-1): The potential for NPS impacts from urban sources was estimated as high.

'04 **Upper Pigeon Cr. (0314-0303-050):** Pigeon Cr. (PGNB-2) and Halls Cr. (HALB-1) were monitored in 2004. Macroinvertebrate communities were assessed as *fair* at PGNB-2 and HALB-1. Forestry and pasture runoff were the main SWCD nonpoint source concerns within the sub-watershed.

'99 **Conecuh River (0314-0304-010):** Screening level macroinvertebrate assessments conducted on Folley Cr. (FYCE-1), Maye Mill Cr. (MMCE-1), Menden Hall Cr. (MHCE-1), Maye Cr. (MYCE-1) and Silas Cr. (SSCE-1), identified Conecuh River as a priority sub-watershed. Water quality sampling suggested sedimentation and nutrient enrichment as potential causes for the impairment. Aquaculture and urban development were identified as concerns within the sub-watershed based on SWCD information.

'04 **Jernigan Mill Cr. (0314-0304-070):** Potential NPS impacts from mining were estimated as high. Macroinvertebrate communities on Jernigan Mill Cr. at JRME-2 were assessed as *fair*.

'99 **Little Escambia Cr. (0314-0304-090):** A screening level macroinvertebrate assessment rated Narrow Gap Cr. at NGCE-1 as *fair*. SWCD estimates indicated a moderate potential for impairment from mining activities.

’99 **Sizemore Cr. (0314-0305-030):** Macroinvertebrates were assessed as *fair* in Sizemore Cr. at both SECE-1 and SECE-2. Screening level water quality samples suggested pathogens and nutrient enrichment to be potential sources for impairment. Information compiled by the SWCD suggested crop runoff and mining activities to be the primary NPS concerns within the sub-watershed. Silviculture has also been noted within the sub-watershed during site reconnaissance.

THIS PAGE INTENTIONALLY BLANK

REFERENCES

ACES. 1997. Soil areas of Alabama (map and legend description). Alabama Cooperative Extension System and U.S. Dept. of Agriculture-Natural Resources Conservation Service. Auburn, Alabama.

ADEM. 1999a. Surface water quality screening assessment of the Black Warrior River, Alabama. Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 1999b. ADEM administrative code chapter 335-6-7 (CAFO Program Rules). Alabama Department of Environmental Management, Montgomery, Alabama

ADEM. 1999d. Quality assurance manual for the Alabama Department of Environmental Management Central Laboratory. Field Operations Division, Alabama Department of Environmental Management. Montgomery, AL.

ADEM. 1999e. Standard operating procedures and quality assurance manual, Volume II -- biological. Field Operations Division, Alabama Department of Environmental Management, Montgomery, Alabama.

ADEM. 2000a. Surface water quality screening assessment of the Tennessee River Basin, Alabama. Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2000b. Alabama Department of Environmental Management water quality assessment methodology. Water Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2000c. Standard operating procedures and quality assurance manual, Volume I -- physical/chemical. Field Operations Division, Alabama Department of Environmental Management, Montgomery, Alabama.

ADEM. 2002a. Nonpoint source screening assessment of the southeast Alabama River basins-1999: Chattahoochee and Chipola River basins. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2002b. Nonpoint source screening assessment of the southeast Alabama River basins-1999: Choctawhatchee River basin. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2002c. Nonpoint source screening assessment of the southeast Alabama River basins-1999: Perdido-Escambia River basins. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2002d. Surface water quality screening assessment of the Alabama River Basin – 2000. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2002e. Surface water quality screening assessment of the Coosa River Basin – 2000. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2002f. Surface water quality screening assessment of the Tallapoosa River Basin – 2000. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2003a. Alabama's 2002 CWA §303(d) list of impaired waters. Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2003c. Surface water quality screening assessment of the Escatawpa River, Mobile Bay, and Upper and Lower Tombigbee River Basins. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2003d. Surface water quality screening assessment of the Escatawpa River, Mobile Bay, and Upper and Lower Tombigbee River Basins: Appendices. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2003e. Water Quality Criteria and Water Use Classifications for Interstate and Intrastate Waters. Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2004a. Analysis guidelines for the MB-EPT aquatic macroinvertebrate bioassessment method and habitat assessment (Draft). Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2005a. Surface water quality screening assessment of the Tennessee basin. Part I: Wadeable rivers and streams. Field Operations Division, Alabama Department of Environmental Management. Montgomery, Alabama.

ADEM. 2005b. Standard operating procedures and quality assurance manual, Volume II -- biological. Field Operations Division, Alabama Department of Environmental Management, Montgomery, Alabama.

ASWCC 1998. Conservation Assessment worksheets completed by Local Soil and Water Conservation Districts. Alabama Soil and Water Conservation Committee, Montgomery, Alabama.

Barbour, M.T. and J.B. Stribling. 1991. Use of habitat assessment in evaluating the biological integrity of stream communities, In: Biological Criteria: Research and Regulation. pp. 25-38. EPA-440/5-91-005. EPA, Office of Water, Washington, DC.

Barbour, M.T. and J.B Stribling. 1994. A technique for assessing stream habitat structure. In Proceedings of the conference "Riparian ecosystems of the humid United States: function, values, and management." National Association of Conservation Districts, Washington, D.C. pp. 156-178.

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid bioassessment protocols for use in streams and wadeable rivers: periphyton, benthic macroinvertebrates, and fish. Second edition. EPA 841-B-99-002. Office of Water, U.S. Environmental Protection Agency. Washington, DC.

EPA. 1997b. Revision to Rapid Bioassessment Protocols for Use in Streams and Rivers: Periphyton, Benthic Macroinvertebrates, and Fish (Draft). EPA 841-D-97-002. Office of Water, U.S. Environmental Protection Agency. Washington, DC.

Griffith G.E., J.M. Omernik, J.A. Comstock, S. Lawrence. G. Martin, A. Goddard, V.J. Hulcher, and T. Foster. 2001. Ecoregions of Alabama and Georgia, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,700,000).

Mettee, M.F., O'Neil, P.E., and Pierson, J.M. 1996. Fishes of Alabama and the Mobile basin. Oxmoor House, Birmingham, Alabama. 820pp.

Mulholland, P.J., and Lenat, D.R. 1992. Streams of the Southern Piedmont, Atlantic Drainage. *In:* C.T.Hanckney et al, eds. Biodiversity of the Southeastern United States—Aquatic Communities. Wiley and Sons. pp. 193-233.

NRCS. 1997. Soil areas of Alabama. (Map and Legend description). U.S. Department of Agriculture-Natural Resources Conservation Service. Auburn, Alabama.

Olson, J.R. and J.A. Gore. 2000. Using GIS and landuse data to select candidate reference sites for stream bioassessment. Oral presentation at the Annual Meeting of the Southeastern Water Pollution Biologists Association. Atlantic Beach, North Carolina. November 6-8, 2000.

Pitt, R. 2000a. Predicting changes in water quality resulting from changing landuse. Oral presentation at the Annual Alabama Water Resources Conference and Symposium. Gulf Shores, Alabama. September 6-8, 2000.

Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: benthic macroinvertebrates and fish. EPA/444/4-89-001. Office of Water, U.S. Environmental Protection Agency. Washington DC.

USDA. 1995. State of Alabama Hydrologic Unit map with drainage areas by counties and sub-watersheds. U.S. Department of Agriculture Soil Conservation Service in cooperation with Alabama Department of Economic and Community Affairs. Auburn, Alabama.

Trimble, S.W. 1974. Man-induced soil erosion on the southern Piedmont. 1700-1970. Ankeny, Ia. Soil Conservation Society of America. 180pp.

Vannote, R.L., G.W. Minshall, K.W. Cummins, J.R. Sedell, and C. E. Cushing. 1980. The river continuum concept. Canadian Journal of Fisheries and Aquatic Sciences 37:130-37.

APPENDICES

Appendix A. List of stations assessed or attempted as part of the 2004 surface water quality NPS screening assessments of the SE AL Basins.

11-digit HUC			Reason for sampling					Station Description						
Basin	CU	Sub-watershed	1999 NPS Priority Sub-watershed	M/H Impairment Potential	CWP [a]	303(d) NPS Impaired Streams (2002)	Recent Data Unavailable	Stream	Station [b]	Assessment Type [c]	Sub-ecoregion	County	Latitude	Longitude
0313	0002	310		M			X	Mill Cr	MLLL-1	H, M, C	45b	Lee	32.65261	-85.11044
0313	0002	250		M			X	Moores Cr	MOOC-1	H, M, C	45b	Chambers	32.86257	-85.22134
0313	0002	250		M			X	Moores Cr	MOOC-2	H, M, C	45b	Chambers	32.85445	-85.20124
0313	0003	160		M			X	Cliatt Branch	CLTR-1	H, M, C	65d	Russell	32.10735	-85.07960
0313	0003	160		M			X	Little Barbour Cr	LBRR-1	H, M, C	65d	Russell	32.07201	-85.11675
0313	0004	040		H			X	Abbie Cr	ABBH-5	H, M, C	65d	Henry	31.50790	-85.22260
0313	0004	040		H			X	Petermann Cr	PTRH-1	H, M, C	65d	Henry	31.48045	-85.14764
0313	0004	040		H			X	Sandy Cr	SNCH-1	H, M, C	65g	Henry	31.43720	-85.25963
0313	0004	040		H			X	Ward Cr	WRDH-1	H, M, C	65g	Henry	31.45559	-85.26328
0313	0004	050		H			X	Foster Cr	FSTH-1	H, M, C	65g	Henry	31.36619	-85.12874
0313	0004	100		M			X	Bryans Cr	BRYH-1	H, M, C	65g	Houston	31.06958	-85.04501
0313	0012	010		M			X	Cowarts Cr	CWTH-1	H, M, C	65g	Houston	31.07492	-85.21895
0313	0012	010		M			X	Cowarts Cr	CWTH-2	H, M, C	65g	Houston	31.01695	-85.22313
0314	0103	010		M			X	Yellow River	YERC-1	H, M, C	65f	Covington	31.35732	-86.34202
0314	0103	010		M			X	Yellow River	YERC-2	H, M, C	65g	Covington	31.27386	-86.34889
0314	0103	040		M			X	Lightwood Knot Cr	LWKC-1 [m]		65g	Covington	31.27085	-86.31320
0314	0103	040		M			X	Lightwood Knot Cr	LWKC-1A	H, M, C	65g	Covington	31.23986	-86.33708
0314	0103	040		M			X	Poley Cr	PLYC-1	H, M, C	65f	Covington	31.38816	-86.27901
0314	0103	040		M			X	Poley Cr	PLYC-3 [nw]		65f	Covington	31.30357	-86.29766
0314	0103	090		M			X	Crooked Cr	CRKC-1	H, M, C	65f	Covington	31.01183	-86.54959
0314	0103	090		M			X	Larkin Cr	LRKC-1	H, M, C	65f	Covington	31.00883	-86.53502
0314	0106	040		M			X	Bushy Cr	BUSB-1 [nw]		65f	Baldwin	30.99746	-87.65326
0314	0106	040		M			X	Dyas Cr	DYSB-1 [nw]		65f	Baldwin	30.93374	-87.68493
0314	0106	040		M			X	Dyas Cr	DYSB-2	H, M, C	65f	Baldwin	30.86992	-87.64024
0314	0106	190		M			X	Narrow Gap Cr	NGCB-1	H, M, C	65f	Baldwin	30.46327	-87.48045
0314	0106	190		M			X	Negro Cr	NGOB-1	H, M, C	65f	Baldwin	30.50058	-87.58168
0314	0106	010		M			X	Perdido River	PRDE-1	H, M, C	65f	Escambia	31.00376	-87.59910
0314	0106	170		M		X	X	Styx River	STXB-1	H, M, C	65f	Baldwin	30.66385	-87.63926
0314	0106	170		M		X	X	Styx River	STXB-2	H, M, C	65f	Baldwin	30.64173	-87.61122
0314	0106	190		M			X	Three Mile Cr	TMEB-1	H, M, C	65f	Baldwin	30.47287	-87.55510

a. Clean Water Partnership (CWP)

b. Not assessed due to: nf=No Flow. nw=Not Wadeable. m= Moved

c. H=habitat; M=macroinvertebrate community; F= fish community; C=water chemistry

Appendix A. cont. List of stations assessed or attempted as part of the 2004 surface water quality NPS screening assessments of the SE AL Basins.

			Reason for sampling											
Basin	CU	Sub-watershed	1999 NPS Priority Sub-watershed	M/H Impairment Potential	CWP [a]	303(d) NPS Impaired Streams	Recent Data Unavailable	Stream	Station [b]	Assessment Type [c]	Sub-ecoregion	County	Latitude	Longitude
0314	0201	030		M			X	Blackwood Cr	BLKD-1	H, M, C	65g	Dale	31.37650	-85.44840
0314	0201	050		M			X	Lindsey Cr	LNDB-1	H, M, C	65d	Barbour	31.72006	-85.48532
0314	0201	100	X	M			X	Judy Cr	JUDD-1	H, M, C	65d	Dale	31.46343	-85.57217
0314	0201	100	X	M			X	Sevenmile Cr	SEVD-1	H, M, C	65d	Dale	31.49770	-85.58270
0314	0201	160		M			X	Claybank Cr	CLYD-1	H, M, C	65d	Dale	31.28544	-85.73868
0314	0201	180		M			X	Cowpen Cr	COWD-1	H, M, C	65g	Dale	31.32255	-85.75737
0314	0201	190		H			X	Line Cr	LNED-1	H, M, C	65g	Dale	31.26543	-85.77011
0314	0201	230		M	X		X	Double Bridges Cr	DBCC-1	H, M, C	65g	Coffee	31.25521	-85.94731
0314	0201	230		M	X		X	Double Bridges Cr	DBCC-2	H, M, C	65g	Coffee	31.21353	-85.95780
0314	0201	230		M			X	Little Double Bridges Cr	LDBC-1	H, M, C	65g	Coffee	31.27247	-85.95872
0314	0201	230		M			X	Little Double Bridges Cr	LDBC-2	H, M, C	65g	Coffee	31.25511	-85.95161
0314	0201	250		H			X	Beaverdam Cr	BDCG-1	H, M, C	65g	Geneva	31.11553	-85.93486
0314	0202	020		M	X		X	Hurricane Cr	HURB-1	H, M, C	65d	Barbour	31.82641	-85.63547
0314	0202	040	X	H			X	Bowden Mill Cr	BMCP-1 [nf]		65d	Pike	31.62163	-85.76903
0314	0202	040	X	H	X		X	Clearwater Cr	CWCC-1	H, M, C	65d	Coffee	31.56408	-85.83814
0314	0202	040	X	H			X	Halls Cr	HALC-1	H, M, C	65d	Coffee	31.51915	-85.87604
0314	0202	080	X	H			X	Big Cr	BIGC-1 [nw]		65d	Coffee	31.52296	-86.05883
0314	0202	080	X	H			X	Big Cr	BIGP-1 [m]		65d	Pike	31.67821	-85.99431
0314	0202	080	X	H			X	Big Cr	BIGP-1A	H, M, C	65d	Pike	31.73780	-85.98310
0314	0202	080	X	H			X	Bluff Cr	BLFC-1	H, M, C	65d	Coffee	31.54773	-86.07662
0314	0202	080	X	H	X		X	Cowpen Cr	COWC-1	H, M, C	65d	Coffee	31.55572	-86.03578
0314	0202	130		M			X	Corner Cr	CNRG-1	H, M, C	65g	Geneva	31.06160	-86.15530
0314	0203	010		H			X	Spring Cr	SPRG-3	H, M, C	65g	Geneva	31.03368	-85.82603
0314	0203	050		H			X	Wrights Cr	WRIG-1 [nw]		65g	Geneva	31.06137	-85.55620
0314	0301	020		M			X	Beeman Cr	BMNP-1	H, M, C	65d	Pike	31.85298	-86.03393
0314	0301	020		M			X	Indian Cr	INDP-1	H, M, C	65d	Pike	31.78648	-86.08103
0314	0301	020		M			X	Mannings Cr	MANP-1 [nf]		65d	Pike	31.93409	-85.95741

a. Clean Water Partnership (CWP)

b. Not assessed due to: nf=No Flow. nw=Not Wadeable. m= Moved

c. H=habitat; M=macroinvertebrate community; F= fish community; C=water chemistry

Appendix A. cont. List of stations assessed or attempted as part of the 2004 surface water quality NPS screening assessments of the SE AL Basins.

			Reason for sampling											
Basin	CU	Sub-watershed	1999 NPS Priority Sub-watershed	M/H Impairment Potential	CWP [a]	303(d) NPS Impaired Streams	Recent Data Unavailable	Stream	Station [b]	Assessment Type [c]	Sub-ecoregion	County	Latitude	Longitude
0314	0302	010		M			X	Olustee Cr	OLUM-1 [nf]		65d	Montgomery	31.97505	-86.09358
0314	0302	010		M			X	Olustee Cr	OLUP-3	H, M, C	65d	Pike	31.90428	-86.14828
0314	0302	010		M			X	Patsaliga Cr	PALP-1 [nf]		65d	Pike	31.90795	-86.17525
0314	0302	020		M			X	Blue Cr	BLUC-1	H, M, C	65d	Crenshaw	31.90758	-86.25493
0314	0302	020		M			X	Dry Cr	DYCC-1	H, M, C	65d	Crenshaw	31.88801	-86.22385
0314	0302	020		M			X	Dry Cr	DYCC-2 [nf]		65d	Crenshaw	31.84714	-86.21218
0314	0302	020		M			X	Poley Cr	POLC-1	H, M, C	65d	Crenshaw	31.84062	-86.22466
0314	0303	020		M			X	Beaver Cr	BEAB-1	H, M, C	65d	Butler	31.78687	-86.66697
0314	0303	020		M			X	Hawkins Cr	HWKB-1	H, M, C	65d	Butler	31.74882	-86.62421
0314	0303	020		M			X	Mill Cr	MLLB-1	H, M, C	65d	Butler	31.54871	-86.68067
0314	0303	020		M			X	Peavy Cr	PEVB-1	H, M, C	65d	Butler	31.82063	-86.67069
0314	0303	020		M			X	Persimmon Cr	PRSB-2	H, M, C	65d	Butler	31.79586	-86.60339
0314	0303	050		M			X	Halls Cr	HALB-1	H, M, C	65d	Butler	31.83518	-86.51417
0314	0303	050		M			X	Pigeon Cr	PGNB-1	H, M, C	65d	Butler	31.87702	-86.50222
0314	0303	050		M			X	Pigeon Cr	PGNB-2	H, M, C	65d	Butler	31.81946	-86.50219
0314	0303	050		M			X	Pigeon Cr	PGNB-3 [nw]		65d	Butler	31.71580	-86.52090
0314	0304	070		M			X	Jernigan Mill Cr	JRME-2	H, M, C	65f	Escambia	31.04170	-87.17525
0314	0305	010		M			X	Big Escambia Cr	BECM-1	H, M, C	65f	Monroe	31.42564	-87.37606

a. Clean Water Partnership (CWP)

b. Not assessed due to: nf=No Flow. nw=Not Wadeable. m= Moved

c. H=habitat; M=macroinvertebrate community; F= fish community; C=water chemistry

Appendix B. List of 2004 NPS stations dropped from Sampling List after Recon.

11-digit HUC			Reason for recon					Reason Station was dropped [a]	Station Description				
Basin	CU	Sub-watershed	1999 NPS Priority Subwatershed	M/H Impairment Potential	CWP [b]	303(d) NPS Impaired Streams (2002)	Recent Data Unavailable		Stream	Station	Sub-ecoregion	County	T / R / S
0313	0002	250		M			X	UC	Moores Cr	MOOC-3	45b	Chambers	21N/29E/27
0313	0003	160		M			X	NW	S. Fk. Cowikee Cr	SFCB-1	65d	Barbour	12N/28E/22
0313	0003	160		M			X	AI	S. Fk. Cowikee Cr	SFCB-1A	65d	Barbour	12N/27E/23
0313	0004	040		H			X	NF	Abbie Cr	ABBH-1	65d	Henry	8N/28E/22
0313	0004	040		H			X	NF	Abbie Cr	ABBH-2	65d	Henry	7N/28E/2
0313	0004	040		H			X	AI	Abbie Cr	ABBH-3	65g	Henry	7N/28E/23
0313	0004	040		H			X	LE	Little Abbie Cr	LABH-1	65g	Henry	7N/28E/3
0313	0012	010		M			X	FI	Rocky Cr	ROKH-1	65g	Houston	2N/28E/36
0313	0012	010		M			X	AI	Webb Cr	WEBH-1	65g	Houston	2N/28E/19
0314	0103	010		M			X	NW	Yellow River	YERC-3	65f	Covington	2N/16E/33
0314	0103	010		M			X	NW	Yellow River	YERC-4	65g	Covington	1N/15E/34
0314	0103	040		M			X	NW	Poley Cr	PLYC-2	65f	Covington	4N/17E/12
0314	0106	010		M			X	NW	Perdido Cr	PRCE-1	65f	Escambia	1N/5E/4
0314	0106	010		M			X	AI	Fletcher Cr	FLTE-1	65f	Escambia	1N/5E/5
0314	0106	040		M			X	NW	Bushy Cr	BUSB-2	65f	Baldwin	1S/4E/16
0314	0106	170		M		X	X	NW	Styx River	STXB-3	65f	Baldwin	5S/5E/14
0314	0106	180		M	X		X	AI	Cowpen Cr	CWPB-1	65f	Baldwin	5S/5E/22
0314	0106	190		M			X	NW	Blackwater River	BKWB-1	65f	Baldwin	6S/5E/20
0314	0201	050		M			X	AI	U. W. Fk. Choctawh. R.	UWCD-1	65d	Dale	7N/25E/24
0314	0201	060		M			X	AI	Bear Cr	BEAD-1	65d	Dale	7N/26E/19
0314	0201	090		H			X	NW	Little Judy Cr	LJCD-1	65d	Dale	7N/25E/30
0314	0201	100	X	M			X	LE	Cotton Cr	COTD-1	65d	Dale	6N/25E/8
0314	0201	230		M	X		X	NW	Double Bridges Cr.	DBCG-3	65g	Geneva	2N/21E/6
0314	0201	250		H	X		X	NW	Double Bridges Cr	DBCG-4	65g	Geneva	1N/22E/20

a = Reason why station dropped from sampling list of stations: **AI** = Access issues(eg private property, access dangerous, etc.), **BC=** Bridge construction, **FI** = Flow issues (no flow, flow severely restricted by dam), **LE** = Lake / Pond upstream affecting water quality), **NW** = not wadeable, **SD** = small drainage size, **UC** = Urban channel (drainage ditch).

b = Clean Water Partnership (CWP)

Appendix B. cont. List of 2004 NPS stations dropped from Sampling List after Recon.

11-digit HUC			Reason for recon					Reason Station was dropped [a]	Station Description				
Basin	CU	Sub-watershed	1999 NPS Priority Subwatershed	M/H Impairment Potential	CWP [b]	303(d) NPS Impaired Streams (2002)	Recent Data Unavailable		Stream	Station	Sub-ecoregion	County	T / R / S
0314	0202	030	X	H	X		X	NW	Buckhorn Cr	BHCP-1	65d	Pike	9N/23E/11
0314	0202	030	X	H	X		X	AI	Buckhorn Cr	BHCP-?	65d	Pike	10N/23E/17
0314	0202	030	X	H	X		X	AI	Little Buckhorn Cr	LBCP-1	65d	Pike	10N/23E/17
0314	0202	030	X	H	X		X	NW	Richland Cr	RLCP-alt	65d	Pike	10N/22E/26
0314	0202	030	X	H	X		X	NW	Richland Cr	RLCP-1	65d	Pike	9N/23E/17
0314	0202	030	X	H	X		X	NW	Richland Cr	RLCP-2	65d	Pike	9N/23E/28
0314	0202	040	X	H	X		X	NW	Pea River	PERC-1	65d	Coffee	5N/21E/5
0314	0203	010		H			X	NW	Spring Cr	SPRG-1	65g	Geneva	1N/23E/27
0314	0203	010		H			X	AI	Spring Cr	SPRG-2	65g	Geneva	1N/22E/21
0314	0203	050		H			X	AI	Wrights Cr	WRIG-2	65g	Geneva	1N/14W/24
0314	0301	020		M			X	NW	Conecuh R	CNRP-1	65d	Pike	10N/20E/34
0314	0302	010		M			X	SD	Fannin Mill Cr	FAMP-1	65d	Pike	1N/19E/10
0314	0302	010		M			X	AI	Little Patsaliga Cr	LPAP-1	65d	Pike	11N/19E/12
0314	0302	010		M			X	BC	Olustee Cr	OLUP-2	65d	Pike	11N/19E/11
0314	0302	020		M			X	NW	Blue Cr	BLUC-3	65d	Crenshaw	10N/18E/24
0314	0302	020		M			X	NW	Piney Woods Cr	PIWC-1	65d	Crenshaw	10N/18E/13
0314	0303	020		M			X	AI	Persimmon Cr	PRSB-1	65d	Butler	10N/14E/6
0314	0303	050		M			X	NW	Pigeon Cr	PGNB-4	65d	Butler	8N/15E/28
0314	0303	050		M			X	NW	Pigeon Cr	PGNB-5	65d	Butler	7N/15E/7
0314	0303	050		M			X	NW	Pigeon Cr	PGNB-6	65d	Butler	7N/14E/23
0314	0303	050		M			X	NW	Pigeon Cr	PGNB-8	65d	Cov/Conecuh	5N/14E/5
0314	0303	050		M			X	NW	Three Run Cr	TRCB-1	65d	Butler	11N/16E/20
0314	0303	050		M			X	LE	Three Run Cr	TRCB-2	65d	Butler	11N/16E/28
0314	0304	070		M			X	NW	Jernigan Mill Cr	JRME-1	65f	Escambia	1N/9E/4
0314	0305	010		M			X	NW	Big Escambia Cr	BECM-2	65f	Monroe	4N/8E/8
0314	0305	010		M			X	BC	Big Escambia Cr	BECM-3	65f	Monroe	4N/8E/31

a = Reason why station dropped from sampling list of stations: **AI** = Access issues(eg private property, access dangerous, etc.), **BC**= Bridge construction, **FI** = Flow issues (no flow, flow severely restricted by dam), **LE** = Lake / Pond upstream affecting water quality), **NW** = not wadeable, **SD** = small drainage size, **UC** = Urban channel (drainage ditch).

b = Clean Water Partnership (CWP)

Appendix C. Descriptions of 2004 NPS stations located within the SE AL Basins.

Basin	CU	Sub-watershed	County	Station	Project	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub- ecoregion
0313	0002	310	Lee	MLLL-1	NPS Screen	Mill Cr	Mill Creek @ Lee Co Rd 334 intersect	19N/29E/11	32.65261	-85.11044	45b
0313	0002	250	Chambers	MOOC-1	NPS Screen	Moores Cr	Moore's Creek @ Co Rd 208 (Phillips Rd) intersect	22N/28E/27	32.86257	-85.22134	45b
0313	0002	250	Chambers	MOOC-2	NPS Screen	Moores Cr	Moore's Creek @ AL Hwy 50 intersect	22N/28E/35	32.85445	-85.20124	45b
0313	0003	160	Russell	CLTR-1	NPS Screen	Cliatt Branch	Cliatt Branch @ AL Hwy 165	13N/29E/13	32.10735	-85.07960	65d
0313	0003	160	Russell	LBRR-1	NPS Screen	Little Barbour Cr	Little Barbour Creek @ Russell Co Rd 44 (Bowden Rd)	13N/29E/34	32.07201	-85.11675	65d
0313	0004	040	Henry	ABBH-5	NPS Screen	Abbie Cr	Abbie Creek @ Henry Co Rd 53 intersect	6N/28E/21	31.50790	-85.22260	65d
0313	0004	040		PTRH-1	NPS Screen	Petermann Cr	Peterman Creek @ Henry Co Rd 28 intersect	5N/29E/17	31.48045	-85.14764	65d
0313	0004	040	Henry	SNCH-1	NPS Screen	Sandy Cr	Sandy Creek @ Henry Co Rd 99	5N/28E/5	31.43720	-85.25963	65g
0313	0004	040	Henry	WRDH-1	NPS Screen	Ward Cr	Ward Creek @ Henry Co Rd 99 intersect	6N/28E/29	31.45559	-85.26328	65g
0313	0004	050	Henry	FSTH-1	NPS Screen	Foster Cr	Foster Creek @ AL Hwy 95	5N/29E/35	31.36619	-85.12874	65g
0313	0004	100	Houston	BRYH-1	NPS Screen	Bryans Cr	Bryans Creek @ AL Hwy 95 intersect	1N/30E/9	31.06958	-85.04501	65g
0313	0012	010	Houston	CWTH-1	NPS Screen	Cowarts Cr	Cowarts Creek @ Rocky Creek Rd	1N/28E/10	31.07492	-85.21895	65g
0313	0012	010	Houston	CWTH-2	NPS Screen	Cowarts Cr	Cowarts Creek @ Houston Co Rd 53 intersect	7N/10W/10	31.01695	-85.22313	65g
0314	0103	010	Covington	YERC-1	NPS Screen	Yellow River	Yellow River @ Covington Co Rd 70/81 intersect	5N/17E/34	31.35732	-86.34202	65f
0314	0103	010	Covington	YERC-2	NPS Screen	Yellow River	Yellow River @ US Hwy 84/AL Hwy 12 intersect	4N/17E/33	31.27386	-86.34889	65g
0314	0103	040	Covington	LWKC-1 [m]	NPS Screen	Lightwood Knot Cr	Lightwood Knot Creek @ US Hwy 84 intersect	4N/17E/35	31.27085	-86.31320	65g
0314	0103	040	Covington	LWKC-1A	NPS Screen	Lightwood Knot Cr	Lightwood Knot Creek@ Covington CR 47	3N/17E/10	31.23986	-86.33708	65g
0314	0103	040	Covington	PLYC-1	NPS Screen	Poley Cr	Poley Creek @ Covington Co Rd 70 intersect	5N/18E/20	31.38816	-86.27901	65f
0314	0103	040	Covington	PLYC-3 [nw]	NPS Screen	Poley Cr	Poley Creek @ Covington Co Rd 42 E intersect	4N/17E/24	31.30357	-86.29766	65f
0314	0103	090	Covington	CRKC-1	NPS Screen	Crooked Cr	Crooked Creek @ intersect with unnamed Co Rd connecting AL Hwy 137 and Covington Co Rd 4 (approx 3.4 miles SE from Beda Church)	1N/15E/33	31.01183	-86.54959	65f
0314	0103	090	Covington	LRKC-1	NPS Screen	Larkin Cr	Larkin Creek @ first Unnamed dirt rd after Yellow River bridge off Covington Co Rd 4	1N/15E/34	31.00883	-86.53502	65f
0314	0106	040	Baldwin	BUSB-1 [nw]	NPS Screen	Bushy Cr	Bushy Creek @ Hoyle Bryars Rd off Baldwin Co Rd 61 W	1S/4E/34	30.99746	-87.65326	65f
0314	0106	040	Baldwin	DYSB-1 [nw]	NPS Screen	Dyas Cr	Dyas Creek @ US Hwy 31 intersect	1S/4E/29	30.93374	-87.68493	65f
0314	0106	040	Baldwin	DYSB-2	NPS Screen	Dyas Cr	Dyas Creek @ Baldwin Co Rd 61 intersect	2S/4E/14	30.86992	-87.64024	65f
0314	0106	190	Baldwin	NGCB-1	NPS Screen	Narrow Gap Cr	Narrow Gap Creek @ Baldwin Co Rd 91 intersect	7S/6E/5	30.46327	-87.48045	65f
0314	0106	190	Baldwin	NGOB-1	NPS Screen	Negro Cr	Negro Creek @Baldwin Co Rd 87 intersect	6S/5E/29	30.50058	-87.58168	65f
0314	0106	010	Escambia	PRDE-1	NPS Screen	Perdido River	Coming from Baldwin Co. take first left Co Rd after crossing county line into Escambia. Cross RR tracks and take first left.	1N/5E/31	31.00376	-87.59910	65f
0314	0106	170	Baldwin	STXB-1	NPS Screen	Styx River	Styx River @ Baldwin Co Rd 68 intersect	5S/4E/26	30.66385	-87.63926	65f
0314	0106	170	Baldwin	STXB-2	NPS Screen	Styx River	Styx River @ Baldwin Co Rd 64 intersect	5S/5E/6	30.64173	-87.61122	65f
0314	0106	190	Baldwin	TMEB-1	NPS Screen	Three Mile Creek	Three Mile Creek @ Baldwin Co Rd 32 intersect	7S/5E/3	30.47287	-87.55510	65f
0314	0201	030	Dale	BLKD-1	NPS Screen	Blackwood Cr	Blackwood Creek @ Dale Co Rd 73 intersect	5N/26E/28	31.37650	-85.44840	65g
0314	0201	050	Barbour	LNDB-1	NPS Screen	Lindsey Cr	Lindsey Creek @ Barbour Co Rd 41 intersect	8N/25E/36	31.72006	-85.48532	65d
0314	0201	100	Dale	JUDD-1	NPS Screen	Judy Cr	Judy Creek @ Dale Co Rd 36	6N/25E/30	31.46343	-85.57217	65d
0314	0201	100	Dale	SEVD-1	NPS Screen	Sevenmile Cr	Sevenmile Creek @ AL Hwy 105 intersect	6N/25E/18	31.49770	-85.58270	65d
0314	0201	160	Dale	CLYD-1	NPS Screen	Claybank Cr	Claybank Creek @ Dale Co Rd 24	4N/23E/28	31.28544	-85.73868	65d
0314	0201	180	Dale	COWD-1	NPS Screen	Cowpen Cr	Cowpen Creek @ Dale Co Rd 1	4N/23E/17	31.32255	-85.75737	65g
0314	0201	190	Dale	LNED-1	NPS Screen	Line Cr	Line Creek @ Dale Co Rd 24	3N/23E/5	31.26543	-85.77011	65g
0314	0201	230	Coffee	DBCC-1	NPS Screen	Double Bridges Cr	Double Bridges Creek @ Coffee Co Rd 636 intersect	3N/21E/4	31.25521	-85.94731	65g
0314	0201	230	Coffee	DBCC-2	NPS Screen	Double Bridges Cr	Double Bridges Creek @ Coffee Co Rd 655 intersect	3N/21E/21	31.21353	-85.95780	65g
0314	0201	230	Coffee	LDBC-1	NPS Screen	Little Double Bridges Cr	Little Double Bridges Creek @ Coffee Co Rd 633 intersect	4N/21E/33	31.27247	-85.95872	65g
0314	0201	230	Coffee	LDBC-2	NPS Screen	Little Double Bridges Cr	Little Double Bridges Creek @ Coffee Co Rd 636 intersect	4N/21E/21	31.25511	-85.95161	65g
0314	0201	250	Geneva	BDCG-1	NPS Screen	Beaverdam Cr	Beaverdam Creek @ Geneva Co Rd 58 intersect	2N/21E/27	31.11553	-85.93486	65g

Not assessed due to: nf=No Flow. nw=Not Wadeable. m= Moved

Appendix C. cont. Descriptions of 2004 NPS stations located within the SE AL Basins.

Basin	CU	Sub-watershed	County	Station	Project	Waterbody Name	Station Description	T / R / S	Latitude	Longitude	Sub- ecoregion
0314	0202	020	Barbour	HURB-1	NPS Screen	Hurricane Cr	Hurricane Creek @ Doyle Sanders Rd off Barbour Co Rd 17	10N/24E/22	31.82641	-85.63547	65d
0314	0202	040	Pike	BMCP-1 nf	NPS Screen	Bowden Mill Cr	Bowden Mill Creek @ Co Rd 3328 (near RR)	8N/23E/32	31.62163	-85.76903	65d
0314	0202	040	Coffee	CWCC-1	NPS Screen	Clearwater Cr	Clearwater Creek @ Coffee Co Rd 105 intersect	7N/22E/22	31.56408	-85.83814	65d
0314	0202	040	Coffee	HALC-1	NPS Screen	Halls Cr	Halls Creek @ Coffee Co Rd 114 and 138 intersect	6N/22E/6	31.51915	-85.87604	65d
0314	0202	080	Coffee	BIGC-1 nw	NPS Screen	Big Cr	Big Creek @ Coffee Co Rd 342 intersect	6N/20E/4	31.52296	-86.05883	65d
0314	0202	080	Pike	BIGP-1 m	NPS Screen	Big Cr	Big Creek @ Pike Co Rd 6 W	8N/20E/12	31.67821	-85.99431	65d
0314	0202	080	Pike	BIGP-1A	NPS Screen	Big Cr	Big Creek@ unnamed Pike Co Rd off Al Hwy 87, first right after Pike Co. Lake Rd	9N/21E/19	31.73780	-85.98310	65d
0314	0202	080	Coffee	BLFC-1	NPS Screen	Bluff Cr	Bluff Creek @ Coffee Co Rd 326	7N/20E/30	31.54773	-86.07662	65d
0314	0202	080	Coffee	COWC-1	NPS Screen	Cowpen Cr	Cowpen Creek @ Coffee Co Rd 315 intersect	7N/20E/27	31.55572	-86.03578	65d
0314	0202	130	Geneva	CNRG-1	NPS Screen	Corner Cr	Corner Creek @ Corner Creek Rd off Geneva Co Rd 10	1N/19E/9	31.06160	-86.15530	65g
0314	0203	010	Geneva	SPRG-3	NPS Screen	Spring Cr	Spring Creek @ Geneva Co Rd 4 intersect	1N/22E/27	31.03368	-85.82603	65g
0314	0203	050	Geneva	WRIG-1 nw	NPS Screen	Wrights Cr	Wrights Creek @ AL Hwy 103	1N/25E/17	31.06137	-85.55620	65g
0314	0301	020	Pike	BMNP-1	NPS Screen	Beeman Cr	Beeman Creek @ Oak Grove Church Rd (Co Rd 1177)	10N/20E/10	31.85298	-86.03393	65d
0314	0301	020	Pike	INDP-1	NPS Screen	Indian Cr	Indian Creek @ Pike Co Rd 2214 also 25	9N/20E/6	31.78648	-86.08103	65d
0314	0301	020	Pike	MANP-1 nf	NPS Screen	Mannings Cr	Mannings Creek @ Pike Co Rd 7718 (second bridge)	11N/21E/16	31.93409	-85.95741	65d
0314	0302	010	Montgomery	OLUM-1 nf	NPS Screen	Olustee Cr	Olustee Creek @ Montgomery Co Rd 89 intersect	12N/20E/31	31.97505	-86.09358	65d
0314	0302	010	Pike	OLUP-3	NPS Screen	Olustee Cr	Olustee Cr @ Pike Co Rd 1 (Shellhorn Hwy)	11N/19E/27	31.90428	-86.14828	65d
0314	0302	010	Pike	PALP-1 nf	NPS Screen	Patsaliga Cr	Patsaliga Creek @ Pike Co Rd 1136/ Crenshaw Co Rd 66	11N/19E/29	31.90795	-86.17525	65d
0314	0302	020	Crenshaw	BLUC-1	NPS Screen	Blue Cr	Blue Creek @ Crenshaw Co Rd 66 intersect	11N/18E/21	31.90758	-86.25493	65d
0314	0302	020	Crenshaw	DYCC-1	NPS Screen	Dry Cr	Dry Creek @ Crenshaw Co Rd 59 intersect	11N/18E/35	31.88801	-86.22385	65d
0314	0302	020	Crenshaw	DYCC-2 nf	NPS Screen	Dry Cr	Dry Creek @ Crensahw Co Rd 30 (first bridge)	10N/18E/13	31.84714	-86.21218	65d
0314	0302	020	Crenshaw	POLC-1	NPS Screen	Poley Cr	Poley Creek @ on unnamed Co Rd off Co Rd 30 approx. 1 mile W of Petrey	10N/18E/14	31.84062	-86.22466	65d
0314	0303	020	Butler	BEAB-1	NPS Screen	Beaver Cr	Beaver Creek @ Tulip Rd off Butler Co Rd 30	9N/14E/4	31.78687	-86.66697	65d
0314	0303	020	Butler	HWKB-1	NPS Screen	Hawkins Cr	Hawkins Creek @ Butler Co Rd 37 intersect	9N/14E/14	31.74882	-86.62421	65d
0314	0303	020	Butler	MLLB-1	NPS Screen	Mill Cr	Mill Creek @ Butler Co Rd 45 intersect	7N/14E/28	31.54871	-86.68067	65d
0314	0303	020	Butler	PEVB-1	NPS Screen	Peavy Cr	Peavy Creek at AL Hwy 10 intersect (off I-65 exit 128)	10N/14E/20	31.82063	-86.67069	65d
0314	0303	020	Butler	PRSB-2	NPS Screen	Persimmon Cr	Persimmon Creek @ Butler Co Rd 45 intersect	10N/14E/36	31.79586	-86.60339	65d
0314	0303	050	Butler	HALB-1	NPS Screen	Halls Cr	Halls Creek @ Butler Co Rd 65 S intersect	10N/15E/13	31.83518	-86.51417	65d
0314	0303	050	Butler	PGNB-1	NPS Screen	Pigeon Cr	Pigeon Creek @ Butler Co Rd 62 intersect	11N/15E/36	31.87702	-86.50222	65d
0314	0303	050	Butler	PGNB-2	NPS Screen	Pigeon Cr	Pigeon Creek @ Butler Co Rd 50 intersect	10N/15E/24	31.81946	-86.50219	65d
0314	0303	050	Butler	PGNB-3 nw	NPS Screen	Pigeon Cr	Pigeon Creek @ Butler Co Rd 59 intersect (James T. Beeland Bridge- 2nd bridge)	9N/15E/35	31.71580	-86.52090	65d
0314	0304	070	Escambia	JRME-2	NPS Screen	Jernigan Mill Cr	Jernigan Mill Creek @ Escambia Co Rd 25 intersect S of US 31	1N/9E/17	31.04170	-87.17525	65f
0314	0305	010	Monroe	BECM-1	NPS Screen	Big Escambia Cr	Big Escambia Creek @ Monroe Co Rd 23 intersect between Excel and Frisco City	4N/8E/4	31.42564	-87.37606	65f

Not assessed due to: nf=No Flow. nw=Not Wadeable. m= Moved

Appendix D. Results of physical/chemical measurements, water quality analyses, and habitat and macroinvertebrate assessments from 2004 NPS screening assessment stations within the Chattahoochee and Chipola River basins.

Sub-Watershed Number	Station	Date (yymmdd)	Time (24hr)	Water Temp. (°C)	Dissolved Oxygen (mg/L)	pH (su)	Conductivity (umhos at 25°C)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	Alkalinity (mg/L)	Hardness (mg/L)	CBOD-5 mg/L	TSS (mg/L)	TDS (mg/L)	NH3-N (mg/L)	TKN (mg/L)	NO_2/NO_3-N (mg/L)	Total-P (mg/L)	DRP */** (mg/L)	TOC (mg/L)	CL^- (mg/L)	Atrazine IA (ug/L)	Assessment Results	
																								Habitat	Macroinvertebrates
Middle Chattahoochee - Lake Harding (0313-0002)																									
310	MLLL-1	040624	1345	23	7.2	7.2	59.4	47.7	1.3															Good	Fair
310	MLLL-1	040803	1100	26	7.3	7.23	63.6	7.82		170	25.5	---	1	57	71	<0.015	<0.15	0.091	0.061	0.026	2.454	4.35	0.06		
250	MOOC-1	040629	1015	25	7.1	7.2	94.4	28.1	0.9															Good	Poor
250	MOOC-1	040803	845	25	6.4	7.18	84.1	18.8	1.7	310	37.5	28.5	1.1	7	74	0.049	0.31	0.105	0.025	0.011	2.923	4.49	<0.05		
250	MOOC-2	040629	1210	27	6.7	7.3	94.4	45.4	1.2															Fair	Poor
250	MOOC-2	040803	940	25	6.2	7.15	99.1	25		350	43.7	32.4	1.8	7	74	0.034	0.37	0.122	0.027	0.011	2.673	5.03	0.08		
Middle Chattahoochee -W. F. George (0313-0003)																									
160	CLTR-1	040617	1225	24	7.5	6.2	37.6	10.2	1.5															Good	Good
160	CLTR-1	040803	1330	25	7.7	6.3	51.7	4.45	1.2	550	2.9	---	1.1	8	53	<0.015	<0.15		0.028	0.012	1.587	6.06	0.06		
160	LBRR-1	040617	1130	25	7.8	6.5	28.9	13.6	3.1															Good	Good
160	LBRR-1	040803	1420	28	7.8	6.76	36.5	9.05	1.7	560	6.9	---	<1	6	40	<0.015	<0.15	0.253	0.032	0.011	3.707	5.21	0.08		
Lower Chattahoochee (0313-0004)																									
40	ABBH-5	040610	1225	26	7.6	7.28	54	20.8	9.7															Good	Fair
40	ABBH-5	040715	830	27	7	7.07	51.8	25.7	13	100	15.1	NAA	1.1	12	52	<0.015	0.57	0.09	0.044	0.024	4.019	5.15	<0.05		
100	BRYH-1	040511	1010	22	4.9	7.03	88.2	2.61	3.2															Excellent	Fair
100	BRYH-1	040714	1545	29	5	7.3	139.5	5.42	0.8	570	57.7	NAA	<1	33	40	<0.015	1.22	0.119	0.004	0.027**	5.653	5.49	0.09		
50	FSTH-1	040610	1510	27	7.6	7.28	65.4	13.7	9.5															Good	Good
50	FSTH-1	040714	1645	29	7.2	7.3	72.9	12.3	8.4	4280	15.8	---	1	13	76	<0.015	0.26	1.43	0.051	0.014	2.187	6.68	<0.05		
40	PTRH-1	040610	1330	27	7.6	7.36	45.6	11.7	13.5															Good	Good
40	PTRH-1	040715	800	25.5	7.6	6.99	52.8	13.4	17.2	960	12.3	NAA	<1	16	58	<0.015	0.36	0.368	0.049	0.024	3.227	5.05	0.05		
40	SNCH-1	040610	955	25	7.6	7.31	69.2	24.6	14.4															Good	Fair
40	SNCH-1	040715	1000	28	7	7.24	84.7	14.5	9.1	750	22.6	NAA	1.5	12	85	<0.015	0.32	1.82	0.048	0.024	2.381	6.63	<0.05		
40	WRDH-1	040610	1055	26	7.2	6.91	45.2	40.6	4.9															Good	Fair
40	WRDH-1	040715	930	26.4	6.8	6.87	53	30.4	4.3	570	11.8	NAA	1.3	15	68	0.015	0.39	0.346	0.067	0.026	3.701	5.8	0.05		
Chipola (0313-0012)																									
10	CWTH-1	040511	1500	23.5	7.1	7.69	172.8	10.3	21.8															Good	Fair
10	CWTH-1	040714	1445	29	6.4	7.6	158.5	12.7	48	200	64.2	NAA	1	19	120	<0.015	0.32	0.396	0.06	0.035	3.953	6.72	0.05		
10	CWTH-2	040511	1330	30	6.6	7.73	210.3	8.54	75.9															Good	Good
10	CWTH-2	040714	1340	28	6.2	7.54	185.8	12.9		690	74.1	NAA	1.1	19	128	<0.015	<0.15	1.27	0.056	0.029	3.561	6.9	0.07		

NAA = No Analysis / Accident. Hardness analysis was inadvertently omitted by ADEM Laboratory.

*= RPD = TP/DRP values within Range Percent Deviation of +-30%.

** = VRPD = TP/DRP values Violate Range Percent Deviation of +- 30 %.

Appendix E. Results of physical/chemical measurements, water quality analyses, and habitat and macroinvertebrate assessments from 2004 NPS screening assessment stations within the Choctawhatchee and Pea River basins.

Sub-Watershed Number	Station	Date (yymmdd)	Time (24hr)	Water Temp. (°C)	Dissolved Oxygen (mg/L)	pH (su)	Conductivity (umhos at 25°C)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	Alkalinity (mg/L)	Hardness (mg/L)	CBOD-5 mg/L	TSS (mg/L)	TDS (mg/L)	NH3-N (mg/L)	TKN (mg/L)	NO_2/NO_3-N (mg/L)	Total-P (mg/L)	DRP (mg/L)	TOC (mg/L)	CL^- (mg/L)	Atrazine IA (ug/L)	Assessment Results: Habitat	Assessment Results: Macroinvertebrates
Upper Choctawhatchee (0314-0201)																									
250	BDCG-1	040519	1005	26	7.8	6.79	57.2	11.1	17															Excellent	Good
250	BDCG-1	040714	1105	28	6.4	6.5	44.5	50.7		1700	9.6	---	1.8	48	124	<0.015	0.49	0.066	0.053	0.03	5.356	5.31	<0.05		
30	BLKD-1	040610	805	25	7.4	7.42	69.3	15.2	24.1															Good	Good
30	BLKD-1	040727	1215	26.5	7	7.06	72.4	10.2	24.1	170	48.3	NAA	1	16	51	<0.015	0.35	0.807	0.004	*	3.048	6.63	0.06		
160	CLYD-1	040520	1045	28	7.6	6.99	69.4	14.8	125.4															Excellent	Good
160	CLYD-1	040727	1445	26	7.2	7.21	82.7	21.8	100.1	820	66.1	NAA	1	30	39	<0.015	0.37	0.519	0.091	0.037	5.001	6.93	<0.05		
180	COWD-1	040526	725	22	7.6	7.16	108.7	13.9	9.2															Fair	Fair
180	COWD-1	040727	1605	26	6.4	6.75	57.9	172	40.6	2000	49.6	NAA	1.8	270	60	<0.015	1.33	0.387	0.356	0.032	8.297	5.97	0.07		
230	DBCC-1	040721	1010	24	6.8	6.84	83.7	21.2	28.1	53	23.4	---	1.5	15	69	<0.015	0.45	0.451	0.063	0.017	4.948	7.69	<0.05		
230	DBCC-1	040525	1145	24	6.9	7.07	88.9	26.1	18.2															Good	Fair
230	DBCC-2	040721	800	23	6.6	6.71	115.8	23.4	58	70	23.5	---	1.6	26	85	<0.015	<0.15	2.15	1.09	1.16*	5.201	10.31	0.05		
230	DBCC-2	040525	925	23	6.6	6.97	128.4	29.3	40.4															Good	Fair
100	JUDD-1	040608	1100	24	7.1	7.11	53.8	15.4	30.4															Good	Fair
100	JUDD-1	040727	1040	27	5.7	6.97	85.8	13.6	5	180	68.2	NAA	1.1	12	62	<0.015	<0.15	0.165	0.007	0.009*	5.109	5.58	0.05		
230	LDBC-1	040525	1620	26	6.6	6.72	50.1	30.7	8.4															Good	Fair
230	LDBC-1	040721	1145	24	6.6	6.55	52.8	18.1	14.4	83	12.6	---	2.1	11	57	<0.015	<0.15	0.294	0.017	0.008	4.637	5.99	<0.05		
230	LDBC-2	040525	1415	25	6.7	6.8	49.5	26.6	12.5															Good	Good
230	LDBC-2	040721	1050	24	6.8	6.68	52	18.3	14.9	93	12.2	---	<1	15	36	<0.015	<0.15	0.327	0.052	0.013	4.41	6.16	<0.05		
50	LNDB-1	040707	1045	26.5	6	7.08	77.2	14.6	16.6															Good	Fair
50	LNDB-1	040803	1600	25	1.9	7.19	266	44.1		50	132.4	---	5.6	128	155	0.015	2.03	<0.003	0.233	0.009	4.045	4.81	0.13		
190	LNED-1	040520	1245	27	7.4	6.91	65.4	9.1	4.7															Excellent	Fair
190	LNED-1	040727	1340	26	7	7	61.6	11.8	7.8	360	53.6	NAA	1.1	13	41	<0.015	0.38	0.18	0.007	0.013*	4.118	5.9	0.22		
100	SEVD-1	040608	915	23	6.4	7.29	62.4	16.3	2.2															Good	Fair
100	SEVD-1	040727	940	25.5	4.6	6.95	90.6	22	0.3	280	68.3	NAA	1.1	40	68	<0.015	0.52	0.039	0.004	*	5.382	5.09	<0.05		
Pea River (0314-0202)																									
80	BIGP-1A	040610	1000	25.5	6.4	7.13	121.7	17.8	4.3															Good	Poor
80	BIGP-1A	040804	930	25	6.6	7.3	146.6	18.3	1.7	29	62.1	58.6	<1	5	44	<0.015	<0.15	0.099	0.03	0.01	3.482	5.66	0.11		
80	BLFC-1	040527	915	21	7.2	7.27	112.8	10.5	0.6															Fair	Fair
80	BLFC-1	040728	810	24	7.2	7.06	71.1	9.3	1.5	280	72.1	NAA	<1	24	67	<0.015	0.37	0.032	0.018	0.015	5.789	5.07	0.1		
130	CNRG-1	040519	1335	26	7.6	7.58	118.6	4.82	27.1															Good	Good
130	CNRG-1	040714	950	26	6.6	7.2	90.5	8.93	53.3	140	36.9	NAA	1.3	17	133	<0.015	0.49	0.126	0.034	0.025	7.358	5.13	<0.05		
80	COWC-1	040527	715	19	6.8	7.03	81.9	20.6	0.1															Excellent	Fair
80	COWC-1	040728	910	24	7.3	7.14	69	11.9	0.3	580	58	NAA	<1	16	60	<0.015	0.43	0.099	0.053	0.015	7.551	5.9	0.08		
40	CWCC-1	040526	1500	25	7.4	7.14	63.2	16	10.8															Excellent	Fair
40	CWCC-1	040728	1020	25	7.3	6.93	68	10.6	9.1	220	61.2	---	<1	13	46	<0.015	0.22	0.903	0.057	0.011	3.899	6.4	0.05		
40	HALC-1	040526	1145	25	7.2	7.04	86.8	12.2																Good	Fair
40	HALC-1	040728	1110	25	7.2	6.85	56.4	44.3	6.6	3960	53.7	---	1.2	33	47	<0.015	0.41	0.231	0.074	0.017	6.583	6.32	0.14		

NAA = No Analysis / Accident. Hardness analysis was inadvertently omitted by ADEM Laboratory.

*= RPD = TP/DRP values within Range Percent Deviation of +-30%.

** = VRPD = TP/DRP values Violate Range Percent Deviation of +- 30 %.

Appendix E. Continued - Results of physical/chemical measurements, water quality analyses, and habitat and macroinvertebrate assessments from 2004 NPS screening assessment stations within the Choctawhatchee and Pea River basins.

Sub-Watershed Number	Station	Date (yymmdd)	Time (24hr)	Water Temp. (°C)	Dissolved Oxygen (mg/L)	pH (su)	Conductivity (umhos at 25°C)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	Alkalinity (mg/L)	Hardness (mg/L)	CBOD-5 mg/L	TSS (mg/L)	TDS (mg/L)	NH3-N (mg/L)	TKN (mg/L)	NO_2/NO_3-N (mg/L)	Total-P (mg/L)	DRP (mg/L)	TOC (mg/L)	CL^- (mg/L)	Atrazine IA (ug/L)	Assessment Results	
																								Habitat	Macroinvertebrates
Pea River cont. (0314-0202)																									
20	HURB-1	040707	1220	26	5.6	6.51	48.8	20.6	2.5															Good	Fair
20	HURB-1	040804	740	25	4.3	6.47	54.2	20.2	0.1	180	14	---	1.6	19	48	<0.015	0.54	0.078	0.065	0.015	6.402	7.53	0.14		
Lower Choctawhatchee (0314-0203)																									
10	SPRG-3	040519	1630	28	7.5	7.18	49	17.8	56.9															Good	Good
10	SPRG-3	040714	1155	25	7.2	6.9	48.3	38.6	80.9	2100	10.4	---	<1	35	64	0.015	0.48	0.567	0.054	0.026	3.957	5.37	0.12		

Appendix F. Results of physical/chemical measurements, water quality analyses, and habitat and macroinvertebrate assessments from 2004 NPS screening assessment stations within the Perdido and Escambia River basins.

Sub-Watershed Number	Station	Date (yymmdd)	Time (24hr)	Water Temp. (^{o}C)	Dissolved Oxygen (mg/L)	pH (su)	Conductivity (umhos at 25^{o}C)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	Alkalinity (mg/L)	Hardness* (mg/L)	CBOD-5 mg/L	TSS (mg/L)	TDS (mg/L)	NH3-N (mg/L)	TKN (mg/L)	NO_2/ NO_3-N (mg/L)	Total-P (mg/L)	DRP (mg/L)	TOC (mg/L)	CL^- (mg/L)	Atrazine IA (ug/L)	Assessment Results	
																								Habitat	Macroinvertebrates
Yellow River (0314-0103)																									
90	CRKC-1	040720	1200	23.8	7.4	6.36	33.3	6.31	3.9	110	4.6	---	<1	17	61	<0.015	0.65	0.204	0.033	0.016	4.633	5.91	<0.05		
90	CRKC-1	040520	1630	24.5	7.7	6.48	34.1	7.61	4.5															Excellent	Fair
90	LRKC-1	040720	1235	22.9	7.8	6.32	33.3	7.4	8.6	150	4.8	---	1.3	16	30	<0.015	0.42	0.434	0.052	0.011	3.144	5.47	<0.05		
90	LRKC-1	040521	715	21	8.2	6.4	37.8	7.3	6.8															Excellent	Fair
40	LWKC-1A	040720	1350	27.3	6.2	6.62	50.9	12.9	6.5	240	13.9	---	1.6	102	24	<0.015	0.32	0.086	0.086	0.012	5.294	5.39	<0.05		
40	LWKC-1A	040608	935	24.5	5.8	6.6	45.1	20.8	27.5															Good	Fair
40	PLYC-1	040720	1645	24.3	6.9	6.27	33	11.1	10.7	60	5.7	---	<1	11	51	<0.015	0.54	0.096	0.05	0.01	4.187	5.27	<0.05		
40	PLYC-1	040608	1420	24	7.2	6.5	35.2	13.9	14.2															Excellent	Fair
10	YERC-1	040720	1600	24.5	6.4	6.61	47.8	14.3	10.5	190	11.1	---	1.7	14	63	0.015	0.5	0.217	0.064	0.015	5.179	5.64	<0.05		
10	YERC-1	040608	1241	23.5	6.3	6.7	48.3	21.9	9.2															Excellent	Fair
10	YERC-2	040720	1505	24.6	6.7	6.8	58	13.5	30.6	93	15.8	---	2.1	19	16	0.015	0.31	0.244	0.06	0.014	4.84	5.7	<0.05		
10	YERC-2	040521	1130	25	7.3	6.9	63.2	18.9	18.3															Good	Good
Perdido River (0314-0106)																									
40	DYSB-2	040513	730	21	6.4	5.3	22.5	3.62	28.2															Excellent	Fair
40	DYSB-2	040714	1010	26	5.8	5.03	23.6	3.99	53.2	24			1.2	13	14	<0.015	0.7	0.011	0.034	0.038*	9.504	4.95	0.77		
40	DYSB-2	040913	1510	24	6.2	5.32	22.6	3.31	26.6	28	<1	---	<1	9	29	0.063	0.49	0.01	0.04	0.033	7.595	5.15	<0.05		
190	NGCB-1	040512	750	21.5	7.4	6.21	50.5	1.63	7.8															Excellent	Good
190	NGCB-1	040713	1415	25	7.2	6.27	49.4	2.5	9.9																
190	NGCB-1	040913	1125	25	7.3	6.04	47.4	2.49	11.6	1500	3.4	---	<1	4	55	<0.015	<0.15	0.583	0.079	0.047	6.772	7.76	<0.05		
190	NGOB-1	040512	1030	22	6.7	6.58	87.4	4.45	16.8															Good	Fair
190	NGOB-1	040713	1610	26	5.4	6.19	62.8	9.74		230	8.8	---	1.8	5	39	<0.015	0.53	0.49	0.045	0.035	8.353	8.72	0.05		
190	NGOB-1	040913	1340	25	5.6	6.15	73.2	11.6		570	9.5	---	<1	4	67	<0.015	0.3	1.08	0.04	0.024	4.703	9.99	<0.05		
10	PRDE-1	040520	1010	23.1	6.8	5.54	26.2	5.57	40.5															Excellent	Good
10	PRDE-1	040714	1145	24.5	6.4	5.47	25.5	10.1		730	1.7	NAA	2.1	10	25	0.015	0.27	0.241	0.033	0.035*	5.509	4.79	<0.05		
10	PRDE-1	040913	1615	23	7.5	5.76	25.8	2.48	32.9	50	2.2	---	<1	5	27	<0.015	0.21	0.455	0.038	*	2.072	5.32			
170	STXB-1	040512	1445	23	8.4	6.49	43.6	3.68	47.8															Good	Fair
170	STXB-1	040714	845	25	7	6.34	42.3	4.94	77.3	73	6.9	---	1.1	2	34	0.015	0.54	0.266	0.035	0.035	5.299	5.93	0.12		
170	STXB-1	040914	915	24	7.6	6.71	58.2	5.46	35.8	110	11.5	---	<1	5	51	0.015	0.3	0.603	0.07	0.042	4.638	6.64	<0.05		
170	STXB-2	040512	1245	22	8.2	6.23	39.2	3.52	105.5															Good	Fair
170	STXB-2	040714	745	24.5	7.4	5.9	33.2	23.8	167.3	520	3	---	1.1	19	38	0.015	0.32	0.329	0.013	*	4.333	5.56	<0.05		
170	STXB-2	040914	810	23	7.6	6.27	41.8	4.96	93.4	150	5.4	---	<1	6	45	0.015	<0.15	0.658	0.041	<0.004	3.359	6.12	<0.05		
190	TMEB-1	040511	1410	23	6.3	6.7	86.4	2.49	8.1															Excellent	Fair
190	TMEB-1	040713	1515	26	5.9	6.6	81.5	3.25	9.1	67	15.4	---	1	7	39	0.015	0.39	0.377	0.034	0.0303	4.75		<0.05		
190	TMEB-1	040913	1245	26	6	6.6	91	3.58	11.3	530	16.3	---	<1	4	69	0.015	0.3	0.336	0.042	0.019	4.957	12.94	<0.05		

NAA = No Analysis / Accident. Hardness analysis was inadvertently omitted by ADEM Laboratory.

*= RPD = TP/DRP values within Range Percent Deviation of +-30%.

** = VRPD = TP/DRP values Violate Range Percent Deviation of +- 30 %.

Appendix F. Continued - Results of physical/chemical measurements and water quality samples collected from 2004 NPS screening assessment stations within the Perdido and Escambia River basins.

Sub-Watershed Number	Station	Date (yymmdd)	Time (24hr)	Water Temp. (°C)	Dissolved Oxygen (mg/L)	pH (su)	Conductivity (umhos at 25°C)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100mL)	Alkalinity (mg/L)	Hardness (mg/L)	CBOD-5 mg/L	TSS (mg/L)	TDS (mg/L)	NH3-N (mg/L)	TKN (mg/L)	NO_2/ NO_3-N (mg/L)	Total-P (mg/L)	DRP (mg/L)	TOC (mg/L)	CL^- (mg/L)	Atrazine IA (ug/L)	Assessment Results	
																								Habitat	Macroinvertebrates
Upper Conecuh (0314-0301)																									
20	BMNP-1	040706	1025	25.5	6.4	7.19	55.6	19.2	6.9															Good	Fair
20	BMNP-1	040804	1055	26	6.7	6.82	42.9	14.5	3.4	130	12.3	13.9	<1	4	317	<0.015	<0.15	0.17	0.03	0.009	3.697	4.52	0.14		
20	INDP-1	040609	1340	26	6.7	6.98	61.5	19.9	6															Excellent	Good
20	INDP-1	040729	1155	26	6.8	6.93	70.6	19.9	4.9	80	25.2	---	<1	12	50	<0.015	<0.15	0.191	0.057	0.009	4.416	5.26	<0.05		
Patsaliga (0314-0302)																									
20	BLUC-1	040617	1230	25	6.5	7.09	76.9	30.3	8.2															Good	Poor
20	BLUC-1	040729	940	24	4.4	6.73	113.4	30.7	0.1	57	44.9	---	1.4	10	68	0.215	0.43	0.09	0.063	<0.004	5.715	5.87	0.06		
20	DYCC-1	040617	1100	23	7	7.18	88.2	54.3	7.2															Good	Poor
10	OLUP-3	040707	845	26	4.4	6.79	82.8	24.2																Good	Fair
10	OLUP-3	040729	850	26	3.9	6.61	61.5	19		67	23.7	---	1.8	4	51	<0.015	0.4	0.046	0.063	0.016	5.919	4.58	0.05		
20	POLC-1	040706	1225	27	5.6	6.97	73.6	14.9	2.9															Good	Fair
20	POLC-1	040729	1040	26	6.6	7.06	85	26.1	1.4	29	34.6	---	1	4	57	<0.015	<0.15	0.043	0.057	0.006	4.647	5.18	<0.05		
Sepulga (0314-0303)																									
20	BEAB-1	040618	830	24.5	2.7	6.7	74.5	15.7	0.7															Excellent	Fair
20	BEAB-1	040722	950	24	2.9	6.79	81.5	11.1	0.3	580	28.8	NAA	2.7	7	73	<0.015	0.44	3	0.04	0.019	4.75	5.69	<0.05		
50	HALB-1	040622	1000	24	6.9	6.84	45.8	31	8.2															Good	Fair
50	HALB-1	040715	945	26.5	7	6.82	44.5	19.6	7.6			---													
20	HWKB-1	040616	1220	26	6.4	7.28	87.5	17.3	12.3															Good	Poor
20	HWKB-1	040722	1140	25	5.8	7.07	96.1	12.9	3.9	43	38.2	NAA	<1	5	89	<0.015	0.39	0.104	<0.004	*	4.256	4.97	<0.05		
20	MLLB-1	040609	1230	23	6.2	6.4	44.4	82.5	4.3															Fair	Poor
20	MLLB-1	040722	1310	24	6.45	6.56	54.9	22.6	2.2	200	10.6	NAA	1	14	71	0.025	0.38	0.154	0.042	0.024	6.557	5.98	0.05		
20	PEVB-1	040616	840	25	6.7	7.02	58.1	18.2	3.5															Fair	Fair
20	PEVB-1	040722	850	23	5.4	7	90.3	14		590	35.6	NAA	1.4	<1	81	<0.015	0.34	0.096	0.005	*	4.731	4.74	<0.05		
50	PGNB-1	040622	900	25	5.6	7.21	130.4	30.2	3.5															Excellent	Good
50	PGNB-1	040715	850	27	6.1	7.17	109.7	25.2	7.6	60	41.8	---	1.1	11	120	<0.015	0.37	0.142	0.041	0.024	6.425	5.36	<0.05		
50	PGNB-2	040622	1115	25	6.5	7	79.2	18.2	30.8															Good	Fair
50	PGNB-2	040715	1040	27.5	6.7	7.15	86.7	21.7	29.4	75	32.5	---	1.4	12	100	<0.015	<0.15	0.317	0.034	0.019	4.886	5.15	<0.05		
20	PRSB-2	040616	1000	25	6.2	7.16	122.3	32	26.5															Excellent	Poor
20	PRSB-2	040715	1150	27	6.4	7.17	64.5	16.3	9.8	44	49.5	NAA	1.8	8	107	<0.015	0.21	0.141	0.046	0.02	3.144	7.01	<0.05		
Lower Conecuh (0314-0304)																									
70	JRME-2	040520	1230	23.5	8	6.44	42.2	7.08	6.3															Good	Fair
70	JRME-2	040720	1010	23.1	7.6	6.2	36.7	7.21	9.3	110	4.4	NAA	1.8	6	33	<0.015	0.33	0.504	0.051	0.013	3.788	5.9	0.09		
70	JRME-2	040913	1740	25	7.5	6.31	38.4	3.89	4.7	27	5.1	---	<1	8	36	<0.015	0.22	0.61	0.04	0.028	3.059	6.49	<0.05		
Escambia (0314-0305)																									
10	BECM-1	040511	945	21	5.8	6.2	54.7	4.49	3.8															Excellent	Good
10	BECM-1	040713	940	25	5.7	6.17	51.2	4.83	4.5	45	8.7	NAA	1.9	9	43	<0.015	0.45	0.3	0.032	0.023	5.674	7.54	<0.05		
10	BECM-1	040914	1145	23	6.1	6.18	54.3	3.94	3.7	110	10.3	---	<1	5	47	<0.015	0.26	0.418	0.033	0.015	3.852	7.73	<0.05		

NAA = No Analysis / Accident. Hardness analysis was inadvertently omitted by ADEM Laboratory.
*= RPD = TP/DRP values within Range Percent Deviation of +-30%.
** = VRPD = TP/DRP values Violate Range Percent Deviation of +- 30 %.

Appendix G. Results of water quality samples collected for Total Metals analyses from 2004 NPS screening assessment stations located within the SE AL basins.

Sub-watershed	Station	Date (yymmdd)	Time (24hr)	Ag (mg/L)	AL (mg/L)	As (ug/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (ug/L)	Pb (ug/L)	Mn (mg/L)	Ni (mg/L)	Sb (ug/L)	Se (ug/L)	Ti (ug/L)	Zn (mg/L)
Middle Chattahoochee - Lake Harding (0313-0002)																		
250	MOOC-1	040803	0845	<0.003	0.134	<10	<0.005	<0.004	<0.005	1.88	<0.3	<2	0.715	<0.006	<2	<10	<1	<0.006
250	MOOC-2	040803	0940	<0.003	0.204	<10	<0.005	<0.004	<0.005	2.15	<0.3	<2	1.27	<0.006	<2	<10	<1	<0.006
Lower Chattahoochee (0313-0004)																		
40	ABBH-5	040715	0830	<0.116	0.157	<10	<0.087	<0.079	<0.086	2.82	<0.3	<2	0.119	<0.228	<2	<10	<1	<0.069
100	BRYH-1	040714	1545	<0.003	0.177	<10	<0.005	<0.004	<0.005	0.59	<0.3	<2	0.281	<0.006	<2	<10	<1	<0.006
40	PTRH-1	040715	0800	<0.003	0.182	<10	<0.005	<0.004	<0.005	1.59	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
40	SNCH-1	040715	1000	<0.003	0.193	<10	<0.005	<0.004	<0.005	1.37	<0.3	<2	0.11	<0.006	<2	<10	<1	<0.006
40	WRDH-1	040715	0930	<0.003	0.204	<10	<0.005	<0.004	<0.005	3.69	<0.3	<2	0.156	<0.006	<2	<10	<1	<0.006
Chipola (0313-0012)																		
10	CWTH-1	040714	1445	<0.003	0.231	<10	<0.005	<0.004	<0.005	0.733	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
10	CWTH-2	040714	1340	<0.003	0.186	<10	<0.005	<0.004	<0.005	0.571	<0.3	<2	0.068	<0.006	<2	<10	<1	<0.006
Upper Choctawhatchee (0314-0201)																		
30	BLKD-1	040727	1215	<0.003	<0.015	<10	<0.005	<0.004	<0.005	1.08	<0.3	<2	0.096	<0.006	<2	<10	<1	<0.006
160	CLYD-1	040727	1445	<0.003	0.18	<10	<0.005	<0.004	<0.005	1.57	<0.3	<2	0.051	<0.006	<2	<10	<1	<0.006
180	COWD-1	040727	1605	<0.003	1.1	<10	<0.005	<0.004	<0.005	5.3	<0.3	3.69	0.326	<0.006	<2	<10	<1	<0.006
230	DBCC-2	040721	0800	<0.003	0.264	<10	<0.005	<0.004	<0.005	3.31	<0.3	<2	0.25	<0.006	<2	<10	<1	<0.006
100	JUDD-1	040727	1040	<0.003	<0.015	<10	<0.005	<0.004	<0.005	1.84	<0.3	<2	0.354	<0.006	<2	<10	<1	<0.006
230	LDBC-2	040721	1050	<0.003	0.141	<10	<0.005	<0.004	<0.005	3.72	<0.3	<2	0.233	<0.006	<2	<10	<1	<0.006
190	LNED-1	040727	1340	<0.003	<0.015	<10	<0.005	<0.004	<0.005	1.8	<0.3	11.4	0.096	<0.006	<2	<10	<1	<0.006
100	SEVD-1	040727	0940	<0.003	0.026	<10	<0.005	<0.004	<0.005	2.23	<0.3	<2	0.24	<0.006	<2	<10	<1	<0.006
Pea River (0314-0202)																		
80	BIGP-1A	040804	0930	<0.003	<0.015	<10	<0.005	<0.004	<0.005	1.99	<0.3	<2	0.489	<0.006	<2	<10	<1	<0.006
80	BLFC-1	040728	0810	<0.003	<0.015	<10	<0.005	<0.004	<0.005	2.06	<0.3	<2	0.104	<0.006	<2	<10	<1	<0.006
130	CNRG-1	040714	0950	<0.116	0.182	<10	<0.087	<0.079	<0.086	0.956	<0.3	<2	0.051	<0.228	<2	<10	<1	<0.069
80	COWC-1	040728	0910	<0.003	<0.015	<10	<0.005	<0.004	<0.005	2.82	<0.3	<2	0.118	<0.006	<2	<10	<1	<0.006
Perdido River (0314-0106)																		
10	PRDE-1	040714	1145	<0.116	0.204	<10	<0.087	<0.079	<0.086	0.873	<0.3	<2	<0.005	<0.228	<2	<10	<1	<0.069
Upper Conecuh River (0314-0301)																		
20	BMNP-1	040804	1055	<0.003	<0.015	<10	<0.005	<0.004	<0.005	2.73	<0.3	<2	0.088	<0.006	<2	<10	<1	<0.006
Sepulga River (0314-0303)																		
20	BEAB-1	040722	0950	<0.003	0.091	<10	<0.005	<0.004	<0.005	3.28	<0.3	<2	0.268	<0.006	<2	<10	<1	<0.006
20	HWKB-1	040722	1140	<0.003	<0.015	<10	<0.005	<0.004	<0.005	1.34	<0.3	<2	0.15	<0.006	<2	<10	<1	<0.006
20	MLLB-1	040722	1310	<0.003	<0.015	<10	<0.005	<0.004	<0.005	2.46	<0.3	<2	0.049	<0.006	<2	<10	<1	<0.006
20	PEVB-1	040722	850	<0.003	0.108	<10	<0.005	<0.004	<0.005	2.61	<0.3	<2	0.876	<0.006	<2	<10	<1	<0.006
20	PRSB-2	040715	1150	<0.116	0.161	<10	<0.087	<0.079	<0.086	1.82	<0.3	<2	0.197	<0.228	<2	<10	<1	<0.069
Lower Conecuh (0314-0304)																		
70	JRME-2	040720	1010	<0.003	0.133	<10	<0.005	<0.004	<0.005	1.43	<0.3	<2	0.104	<0.006	<2	<10	<1	<0.006
Escambia River (0314-0305)																		
10	BECM-1	040713	0940	<0.116	0.171	<10	<0.087	<0.079	<0.086	2.08	<0.3	<2	0.079	<0.228	<2	<10	<1	<0.069

Appendix H. Results of water quality samples collected for Dissolved Metals analyses from 2004 NPS screening assessment stations located within the SE AL basins.

Sub-watershed	Station	Date (yymmdd)	Time (24hr)	Ag (mg/L)	AL (mg/L)	As (ug/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Hg (ug/L)	Pb (ug/L)	Mn (mg/L)	Ni (mg/L)	Sb (ug/L)	Se (ug/L)	Ti (ug/L)	Zn (mg/L)
Middle Chattahoochee - Lake Harding (0313-0002)																		
250	MOOC-1	040803	0845	<0.003	<0.015	<10	<0.005	<0.004	<0.005	<0.005	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
250	MOOC-2	040803	0940	<0.003	<0.015	<10	<0.005	<0.004	<0.005	<0.005	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
Lower Chattahoochee (0313-0004)																		
40	ABBH-5	040715	0830	<0.116	0.157	<10	<0.087	<0.079	<0.086	0.534	<0.3	<2	<0.075	<0.228	<2	<10	<1	<0.069
100	BRYH-1	040714	1545	<0.003	0.175	<10	<0.005	<0.004	<0.005	0.248	<0.3	<2	0.24	<0.006	<2	<10	<1	<0.006
40	PTRH-1	040715	0800	<0.003	0.178	<10	<0.005	<0.004	<0.005	0.33	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
40	SNCH-1	040715	1000	<0.003	0.188	<10	<0.005	<0.004	<0.005	0.515	<0.3	<2	0.068	<0.006	<2	<10	<1	<0.006
40	WRDH-1	040715	0930	<0.003	0.183	<10	<0.005	<0.004	<0.005	0.368	<0.3	<2	0.126	<0.006	<2	<10	<1	<0.006
Chipola (0313-0012)																		
10	CWTH-1	040714	1445	<0.003	0.197	<10	<0.005	<0.004	<0.005	0.297	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
10	CWTH-2	040714	1340	<0.003	0.183	<10	<0.005	<0.004	<0.005	0.181	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
Upper Choctawhatchee (0314-0201)																		
30	BLKD-1	040727	1215	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.385	<0.3	<2	0.046	<0.006	<2	<10	<1	<0.006
160	CLYD-1	040727	1445	<0.003	0.029	<10	<0.005	<0.004	<0.005	0.376	<0.3	<2	0.005	<0.006	<2	<10	<1	<0.006
180	COWD-1	040727	1605	<0.003	0.058	<10	<0.005	<0.004	<0.005	0.28	<0.3	<2	0.05	<0.006	<2	<10	<1	<0.006
230	DBCC-2	040721	0800	<0.003	0.087	<10	<0.005	<0.004	<0.005	0.606	<0.3	<2	0.167	<0.006	<2	<10	<1	<0.006
100	JUDD-1	040727	1040	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.945	<0.3	<2	0.311	<0.006	<2	<10	<1	<0.006
230	LDBC-2	040721	1050	<0.003	0.074	<10	<0.005	<0.004	<0.005	0.531	<0.3	<2	0.18	<0.006	<2	<10	<1	<0.006
190	LNED-1	040727	1340	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.333	<0.3	<2	0.058	<0.006	<2	<10	<1	<0.006
100	SEVD-1	040727	0940	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.623	<0.3	<2	0.239	<0.006	<2	<10	<1	<0.006
Pea River (0314-0202)																		
80	BIGP-1A	040804	0930	<0.003	<0.015	<10	<0.005	<0.004	<0.005	<0.005	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
80	BLFC-1	040728	0810	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.748	<0.3	<2	0.104	<0.006	<2	<10	<1	<0.006
130	CNRG-1	040714	0950	<0.116	0.18	<10	<0.087	<0.079	<0.086	0.37	<0.3	<2	<0.047	<0.228	<2	<10	<1	<0.069
80	COWC-1	040728	0910	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.724	<0.3	<2	0.118	<0.006	<2	<10	<1	<0.006
Perdido River (0314-0106)																		
10	PRDE-1	040714	1145	<0.116	0.196	<10	<0.087	<0.079	<0.086	0.193	<0.3	<2	0.049	<0.228	<2	<10	<1	<0.069
Upper Conecuh River (0314-0301)																		
20	BMNP-1	040804	1055	<0.003	<0.015	<10	<0.005	<0.004	<0.005	<0.005	<0.3	<2	<0.005	<0.006	<2	<10	<1	<0.006
Sepulga River (0314-0303)																		
20	BEAB-1	040722	0950	<0.003	0.085	<10	<0.005	<0.004	<0.005	0.868	<0.3	<2	0.268	<0.006	<2	<10	<1	<0.006
20	HWKB-1	040722	1140	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.69	<0.3	<2	0.145	<0.006	<2	<10	<1	<0.006
20	MLLB-1	040722	1310	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.345	<0.3	<2	0.033	<0.006	<2	<10	<1	<0.006
20	PEVB-1	040722	0850	<0.003	0.085	<10	<0.005	<0.004	<0.005	0.6	<0.3	<2	0.743	<0.006	<2	<10	<1	<0.006
20	PRSB-2	040715	1150	<0.116	0.161	<10	<0.087	<0.079	<0.086	0.507	<0.3	<2	0.168	<0.228	<2	<10	<1	<0.069
Lower Conecuh (0314-0304)																		
70	JRME-2	040720	1010	<0.003	<0.015	<10	<0.005	<0.004	<0.005	0.261	<0.3	<2	0.101	<0.006	<2	<10	<1	<0.006
Escambia River (0314-0305)																		
10	BECM-1	040713	0940	<0.116	0.131	<10	<0.087	<0.079	<0.086	0.324	<0.3	<2	0.058	<0.228	<2	<10	<1	<0.069

Appendix I. 2004 NPS stations with Macroinvertebrate assessments of 'Poor' and 'Fair' .

11-Digit HUC			Eco Region	Station	Date (yymmdd)	% Substrate			Habitat Assessment Results				# EPT Families	Comment
						Gravel	Sand	Silt	Assessment Form[a]	Max Habitat Score	% Max Score	Habitat Assessment		
Stations with "Poor" EPT screening level assessments														
0313	0002	250	45b	MOOC-1	040629	40	25	13	RR	240	61	Good	4	Rain event. High turbidity
0313	0002	250	45b	MOOC-2	040629	0	55	18	GP	220	44	Fair	2	Rain event. Very high turbidity
0314	0202	080	65d	BIGP-1A	040610	0	15	35	GP	220	61	Good	1	high flow. Heavy silt.
0314	0302	020	65d	BLUC-1	040617	0	80	10	GP	220	56	Good	2	rain event. Med turb. High flow.
0314	0302	020	65d	DYCC-1	040617	8	77	5	GP	220	53	Good	2	Very High Turbidity.
0314	0303	020	65d	HWKB-1	040616	0	70	10	GP	220	62	Good	3	Rain event.High flow. Med turbidity.
0314	0303	020	65d	MLLB-1	040609	0	89	1	GP	220	50	Fair	3	Very High Turbidity.
0314	0303	020	65d	PRSB-2	040616	0	10	49	GP	220	66	Excellent	2	Rain event. High flow. High silt
Stations with "Fair" EPT screening level assessments														
0313	0002	310	45b	MLLL-1	040624	12	35	10	RR	240	62.9167	Good	8	
0313	0004	040	65d	ABBH-5	040610	0	90	2	GP	220	52.7273	Good	7	
0313	0004	040	65g	SNCH-1	040610	0	90	2	GP	220	56.3636	Good	7	rain event.

Appendix I. 2004 NPS stations with Macroinvertebrate assessments of 'Poor' and 'Fair' .

11-Digit HUC			Eco Region	Station	Date (yymmdd)	% Substrate			Habitat Assessment Results				# EPT Families	Comment
						Gravel	Sand	Silt	Assessment Form[a]	Max Score	% Max Score	Habitat Assessment		
Stations with "Fair" EPT screening level assessments														
0313	0004	040	65g	WRDH-1	040610	0	95	3	GP	220	51.8182	Good	6	rain event.
0313	0004	100	65g	BRYH-1	040511	0	70	5	GP	220	70.9091	Excellent	6	
0313	0012	010	65g	CWTH-1	040511	0	85	0	GP	220	57.7273	Good	6	
0314	0103	010	65f	YERC-1	040608	0	63	10	GP	220	70.2273	Excellent	6	rain event.
0314	0103	040	65g	LWKC-1A	040608	0	82	15	GP	220	52.9545	Good	4	
0314	0103	040	65f	PLYC-1	040608	0	65	1	GP	220	72.7273	Excellent	7	
0314	0103	090	65f	CRKC-1	040520	0	55	10	GP	220	69.7727	Excellent	7	
0314	0103	090	65f	LRKC-1	040521	0	60	10	GP	220	69.7727	Excellent	5	
0314	0106	040	65f	DYSB-2	040513	0	50	10	GP	220	76.5909	Excellent	6	
0314	0106	170	65f	STXB-1	040512	5	65	10	GP	220	60.2273	Good	7	
0314	0106	170	65f	STXB-2	040512	10	80	0	GP	220	61.5909	Good	7	
0314	0106	190	65f	NGOB-1	040512	0	60	8	GP	220	60.9091	Good	5	
0314	0106	190	65f	TMEB-1	040511	0	70	12	GP	220	73.4091	Excellent	7	
0314	0201	050	65d	LNDB-1	040707	0	54	25	GP	220	61.3636	Good	4	
0314	0201	100	65d	JUDD-1	040608	0	60	2	RR	240	61.875	Good	6	
0314	0201	100	65d	SEVD-1	040608	0	85	7	GP	220	61.8182	Good	4	
0314	0201	180	65g	COWD-1	040526	4	89	1	GP	220	45.2273	Fair	5	
0314	0201	190	65g	LNED-1	040520	0	60	5	GP	220	70.4545	Excellent	6	
0314	0201	230	65g	DBCC-1	040525	0	65	25	GP	220	61.5909	Good	7	
0314	0201	230	65g	DBCC-2	040525	1	90	2	GP	220	66.3636	Good	7	
0314	0201	230	65g	LDBC-1	040525	0	85	5	GP	220	62.0455	Good	5	
0314	0202	020	65d	HURB-1	040707	0	65	4	GP	220	59.7727	Good	6	
0314	0202	040	65d	CWCC-1	040526	0	67	13	GP	220	65.9091	Excellent	5	
0314	0202	040	65d	HALC-1	040526	2	35	3	RR	240	58.3333	Good	7	
0314	0202	080	65d	BLFC-1	040527	0	92	3	GP	220	52.2727	Fair	5	
0314	0202	080	65d	COWC-1	040527	0	85	9	GP	220	55.4545	Good	6	
0314	0301	020	65d	BMNP-1	040706	0	80	0	GP	220	58.4091	Good	4	
0314	0302	010	65d	OLUP-3	040707	0	50	9	GP	220	56.5909	Good	6	

Appendix I. 2004 NPS stations with Macroinvertebrate assessments of 'Poor' and 'Fair' .

11-Digit HUC			Eco Region	Station	Date (yymmdd)	% Substrate			Habitat Assessment Results				# EPT Families	Comment
						Gravel	Sand	Silt	Assessment Form[a]	Max Score	% Max Score	Habitat Assessment		
Stations with "Fair" EPT screening level assessments														
0314	0302	020	65d	POLC-1	040706	0	64	10	GP	220	56.5909	Good	7	
0314	0303	020	65d	BEAB-1	040618	0	75	11	GP	220	70	Excellent	4	
0314	0303	020	65d	PEVB-1	040616	5	80	10	GP	220	49.3182	Fair	7	rain event.
0314	0303	050	65d	HALB-1	040622	0	64	15	GP	220	59.0909	Good	7	
0314	0303	050	65d	PGNB-2	040622	0	79	10	GP	220	61.1364	Good	7	
0314	0304	070	65f	JRME-2	040520	20	71	5	RR	240	52.0833	Good	4	

a: GP=Glide/pool habitat assessment form; RR=Riffle/run habitat assessment form

Appendix J. ADEM- Field Operations Division Riffle/Run habitat assessment field data sheet

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	>50% mix of boulder, cobble, submerged logs, undercut banks, or other stable habitat.	50-30% mix of boulder, cobble, or other stable habitat; adequate habitat.	30-10% mix of boulder, cobble, or other stable habitat; habitat availability less than desirable.	<10% mix of boulder, cobble, or other stable habitat; lack of habitat is obvious.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Epifaunal surface**	Well developed riffle and run; riffles as wide as stream and length is 2x the width of stream; abundance of cobble.	Riffle is as wide as stream, but length is <2 times width; abundance of cobble; boulders and gravel common.	Run area may be lacking; riffle not as wide as stream and its length is <2 times the stream width; gravel or large boulders and bedrock prevalent; some cobble present.	Riffles or run virtually non existent; large boulders and bedrock prevalent; cobble lacking.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Embeddedness**	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble and boulder particles are >75% surrounded by fine sediment.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Velocity/Depth Regimes**	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-shallow, fast-deep).	Only 3 of 4 regimes present. (if fast-shallow is missing, score lower.)	Only 2 of 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Man-made Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; and 40 - 80% of stream reach is channelized and disrupted.	Banks shored with gabion or cement; >80% of the stream reach channelized and disrupted.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Sediment Deposition**	Little or no enlargement of islands or point bars and less than 5 % of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from coarse gravel; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel coarse sand on old and new bars; 30-50% of the bottom affected; sediment deposits at obstruction, constriction, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; > 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Frequency of Riffles** (Distance between riffles/ stream width)	<5 5 6 7	8 9 11 13 15	16 18 21 23 25	26 28 30 32 34 ≥ 35
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Channel flow Status**	Water reaches base of both lower banks.	Water fills >75% of the available channel.	Water fills 75 - 25% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Condition of Banks**	Banks stable; no evidence (<5%) of erosion or bank failure.	Moderately stable; infrequent, small areas (5-30%) of erosion mostly healed over.	Moderately unstable; 30-60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
10 **Bank Vegetative Protection**	>90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
11 **Grazing or other disruptive pressure**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; >1/2 of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; < 1/2 of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to ≤ 2 inches average stubble height.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
12 **Riparian vegetative zone (each bank)**	Width of riparian zone >60 feet; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 60 - 40 feet; human activities have impacted zone only minimally.	Width of riparian zone 40 - 20 feet; human activities have impacted zone a great deal.	Width of riparian zone <20 feet; little or no riparian vegetation due to human activities.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	> 50% mix of snags, submerged logs, undercut banks, or other stable habitat; rubble, gravel may be present.	50-30% mix of stable habitat; adequate habitat for maintenance of populations.	30-10% mix of stable habitat; habitat availability less than desirable.	<10% stable habitat; lack of habitat is obvious.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Pool Substrate Characterization**	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Pool Variability**	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Man-made Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; channelization may be extensive, usually in urban or agriculture lands; and > 80% of stream reach is channelized and disrupted.	Extensive channelization; banks shored with gabion or cement; heavily urbanized areas; instream habitat greatly altered or removed entirely.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Sediment Deposition**	<20% of bottom affected; minor accumulation of fine and coarse material at snags and submerged vegetation; little or no enlargement of islands or point bars.	20-50% affected; moderate accumulation; substantial sediment movement only during major storm event; some new increase in bar formation.	50-80% affected; major deposition; pools shallow, heavily silted; embankments may be present on both banks; frequent and substantial sediment movement during storm events.	Channelized; mud, silt, and/or sand in braided or non-braided channels; pools almost absent due to deposition.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Channel Sinuosity**	Bends in stream increase stream length 3 to 4 times longer than if it was in a straight line.	Bends in stream increase stream length 2 to 3 times longer than if it was in a straight line.	Bends in stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Channel flow Status**	Water reaches base of both lower banks and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure; <5% affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% affected.	Moderately unstable; 30-60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score _____	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Bank Vegetative Protection (each bank)**	> 90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
10 **Grazing or other disruptive pressure (each bank)**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; >1/2 of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; <1/2 of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to ≤ 2 inches average stubble height.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0
11 **Riparian vegetative zone Width (each bank)**	Width of riparian zone >60 feet; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 60 - 40 feet; human activities have impacted zone only minimally.	Width of riparian zone 40 - 20 feet; human activities have impacted zone a great deal.	Width of riparian zone <20 feet; little or no riparian vegetation due to human activities.
Score (LB) _____	10 9 8	7 6	5 4 3	2 1 0
Score (RB) _____	10 9 8	7 6	5 4 3	2 1 0

Appendix L. ADEM - Field Operations Division Water Quality field data sheet

ADEM - FIELD OPERATIONS DIVISION
WATER QUALITY FIELD DATA SHEET

Station #_____ ***Date***_____ ***Collector Names***_____

Reason for Survey ☐ Use Support / 303(d) ☐ Reconnaissance ☐ Pollution Event ☐ Storm Event ☐ Permit Compliance

WATER QUALITY INDICATORS

Water Odors		***Water Surface Oils***		***Water Color***		
☐ Normal/None	☐ Chemical	☐ None	☐ Globs	☐ None	☐ Chalky	☐ Muddy
☐ Sewage	☐ Fishy	☐ Slick	☐ Flecks	☐ Dk. Tannic	☐ Green	☐ Red
☐ Petroleum	☐ Other_____	☐ Sheen	☐ Other_____	☐ Lt .Tannic	☐ Grey	☐ Other_____

Turbidity (if not field measured)		***Biological Indicators***	
☐ None	☐ Moderately Turbid	☐ Fish	☐ Fresh Beaver Sticks
☐ Slightly Turbid	☐ Severely Turbid	☐ Macroinvertebrates	☐ Other_____

ADEM - FIELD OPERATIONS DIVISION WATER QUALITY FIELD DATA SHEET

Now	***Weather***	*Past 24 hrs*
☐	Clear / Cloudless	☐
☐	Partly Cloudy	☐
☐	Mostly Cloudy/Overcast	☐
☐	Cloudy	☐
☐	Light Rain / Drizzle	☐
☐	Rain	☐
☐	Thunderstorms	☐
☐	Freezing Precipitation	☐

Has there been heavy rain in the last 7 days?
☐ Yes ☐ No

Flow Stage
☐ Flood (out of banks)
☐ Above Normal
☐ Normal
☐ Low
☐ Dry

Was Stream Flow Measured? ☐ Not Req'd ☐ No ☐ Yes If no ✓ below

Reason for No Flow:
☐ not wadeable
☐ meter malfunction
☐ visible but not detectable
☐ flow conditions dangerous
☐ no visible flow
☐ pools/dry streambed
☐ visible/too shallow for pygmy

Velocity
☐ Slow
☐ Moderate
☐ Fast

WATER QUALITY FIELD MEASURES

(DUPLICATE @ 10% OF STATIONS)

Parameter	***Value***	***Duplicate***	***Unit***	***Instrument***		
Time			*hrs (24hrs)*	☐ *Clock*	☐ *Sonde*	
Total Depth @ Sampling Pt			*ft.*	☐ *estimate*	☐ *Measure*	
Sampling Depth			*ft.*	☐ *estimate*	☐ *Measure*	
Air Temp.			*℃*	☐ *Thermometer*		
Water Temp.			*℃*	☐ *Thermometer*		☐ *Sonde*
pH			*su*	☐ *pH Meter*		☐ *Sonde*
Conductivity			*µmhos@25℃*	☐ *Meter*		☐ *Sonde*
D.O.			*mg/L*	☐ *Winkler*	☐ *Meter*	☐ *Sonde*
Turbidity			*NTU*	☐ *Meter*		☐ *Sonde*
Stream Flow		*N/A*	*cfs*	☐ *AA*	☐ *Pygmy*	☐ *Acoustic*

WATER SAMPLES COLLECTED

Depth Sampling Depth _____ft ☐ Surface ☐ 5 ft ☐ Mid-Depth ☐ Bottom

Methods ☐ Grab-Jug/Jar ☐ Bucket ☐ Sampler ☐ Field Filtered (FF) ☐ **Duplicate Samples (5% of Stations)**

Preservatives # of Bottles

☐ Iced ½ gal_____#	☐ H2SO4 ½ gal____#	☐ HNO3 ½ gal _____#	☐ Iced 1*L* AGl _____#
☐ Iced ¼ gal_____#	☐ H2SO4 ¼ gal____#	☐ HNO3 ¼ gal _____#	☐ Iced Pvial 25 mL____#
☐ Iced *125mL* FF____#		☐ HNO3 *125mL* FF____#	☐ HCL 2x40mLAGl___#

FF=Field Filtered

BIOLOGICAL SAMPLES COLLECTED

☐ Fish IBI	☐ Chlorophyll *a* *(Collected at 5ft or mid-depth whichever is less)*	☐ Fecal Coliform *(Collected 6-12 inches below surface))*

COMMENTS

Rev 1-8-02 vjh

Appendix M. ADEM - Field Operations Division Physical Characterization field data sheet

ADEM - FIELD OPERATIONS DIVISION

PAGE 1---PHYSICAL CHARACTERIZATION FIELD DATA SHEET

Station #_____ ***Date***_____ ***Collector Names***_____

Reason for Survey □Use Support / 303(d) □Reconnaissance □ Pollution Event □ Ambient □ Permit Compliance

Reach Description_____

WATERSHED FEATURES

Predominant Watershed Land use
□ Forest □ Commercial
□ Field/Pasture □ Industrial
□ Agriculture □ Mixed Urban
□ Residential □ _____

Local Watershed NPS Pollution
□ No Evidence
□ Obvious Sources
□ Potential Sources

Local Watershed Erosion
□ None
□ Slight
□ Moderate
□ Heavy

RIPARIAN LANDUSE & VEGETATION

Land use at Reach
□ Pasture □ Field/Pasture □ Industrial
□ Crops □ Residential □ Mixed Urban
□ Forest □ Commercial □ _____

Dominant Riparian Vegetation Present *(60 ft Buffer) (If known)*
□ Trees □ Herbaceous
□ Shrubs
□ Grasses

Dominant Species Present:_____
_____
_____

INSTREAM FEATURES

Stream Morphology Est.
Reach Length _____ft
Stream Width _____ft
Bank Height _____ft
High Water Mark _____ft

Channelized □ Yes □ No

Canopy Cover
□ Open 0-20%
□ Mostly Open 20-40%
□ Est 50/50 40-60%
□ Mostly Shaded 60-80%
□ Shaded 80-100%

Type: _____

Stream Depth
Riffle _____ft
Run _____ft
Pool _____ft

Proportion of Reach
Riffle_____%
Run _____%
Pool _____%

Est. Gradient
(over 300 ft reach)
□ Low <1ft
□ Medium 1-3 ft
□ High >3ft

Dam Present
□ No
If Yes, Kind?
□ low-head
□ Beaver
□ _____
Relation to
□Above□below

AQUATIC VEGETATION

Check types present. Estimate the % of wetted substrate in the reach with each type, indicate species, if known

*Total % of wetted reach with aquatic vegetation present*_____% *Dominant Vegetation Type:*_____

Type	***% of Wetted Reach***	***Species***	***Type***	***% of Wetted Reach***	***Species***
□ Rooted Emergent	____%	_____	□ Attached Algae	____%	_____
□ Rooted Floating	____%	_____	□ Floating Algae	____%	_____
□ Rooted Submergent	____%	_____	□ Free Floating	____%	_____

WATER QUALITY INDICATORS

Water Odors
□Normal/None
□ Sewage
□ Petroleum
□ Chemical
□ Fishy
□ _____

Surface Oils
□ None
□ Flecks
□ Sheen
□ Slick
□ Globs
□ _____

Turbidity
□ None
□ Slightly Turbid
□ Moderately Turbid
□ Severely Turbid

Water Color
□ None □ Green
□ Dk. Tannic □ Muddy
□ Lt .Tannic □ Red (Dye)
□ Chalky □ Grey
□ _____
□ _____

Biological
□ Fish
□ Fresh Beaver Sticks
□ Macroinvertebrates
□ Mussels
□ Snails
□ _____

SEDIMENT / SUBSTRATE

Sediment Odors
□ Normal □ Chemical
□ Sewage □ Anaerobic
□ Petroleum □ _____

Oils
□ Absent □ Profuse
□ Slight
□ Moderate

Deposits
□ None □ Paper
□ Sludge □ Sand
□ Sawdust

Looking at stones that are not deeply embedded, are the undersides black in color?
□ Yes □ No □ N/A

WEATHER & FLOW CONDITIONS

Now	***Weather***	*Past 24 hrs*
□	Clear / Cloudless	□
□	Partly Cloudy	□
□	Mostly Cloudy/Overcast	□
□	Cloudy	□
□	Light Rain / Drizzle	□
□	Rain	□
□	Thunderstorms	□
□	Freezing Precipitation	□

Flow Stage
□ Flood (out of banks)
□ Above Normal
□ Normal
□ Low
□ Dry
□ Unknown

Velocity
□ Fast >3 ft / Sec
□ Moderate 1.5 – 3 ft /
□ Slow <1.5 ft / Sec
□ No Flow

Was Stream Flow Measured?
□ Yes
□ No If no ✓ reason below
□ not required in Study Plan
□ not wadeable (too deep)
□ meter malfunction
□ visible but not detectable
□ flow conditions dangerous
□ no visible flow
□ pools/dry streambed

Appendix N. ADEM - Field Operations Division Substrate Characterization, Habitat, and Water Quality field data sheet

ADEM - Field Operations Division

Page 2----Substrate Characterization, Habitat & Water Quality Field Data Sheet

Est. % Composition In Sampling Area

Type	Diameter	Percent	Stable
Bedrock			1/2
Boulder	>10 in.		Yes
Cobble	2.5 - 10 in.		Yes
Gravel	0.1 - 2.5 in.		Yes
Sand	Gritty		
Silt			
Clay	Slick		
Detritus	Stick/Wood		Yes
	CPOM		
Muck	Fine Organic		
	Total	100%	

Field Measures (FM) ***(Duplicate at 10% of Stations)*** ***SONDE #____***

Parameter	Value	Duplicate	Unit	Instrument
Time of FM			*hrs (24hrs)*	□*Clock* □*Sonde*
Total Depth			*ft.*	□*Estimate* □*Measure*
Depth of FM			*ft.*	□*Estimate* □*Measure*
Air Temp.			*℃*	□*Thermometer*
Water Temp.			*℃*	□*Thermometer* □ *Sonde*
pH			*su*	□*pH Meter* □*Sonde*
Conductivity			*µmhos@25℃*	□*Meter* □*Sonde*
D.O.			*mg/L*	□*Winkler* □*Meter* □*Sonde*
Turbidity			*NTU*	□*Meter* □*Sonde*
Stream Flow		N/A	*cfs*	□*AA* □*Pygmy* □*Acoustic*

Collection Time _____24hrs

SAMPLES COLLECTED

Relative Sampling Depth □Surface □ 5 ft □ Mid-Depth □Bottom □Photic Zone

Methods □Grab-Jug/Jar □Grab-Bucket □ Grab-Sampler □ Composite-Pump

□ **Duplicate Samples (5%)**
□ **Field Blank s**

Photic Zone Depth _____ft or _____M

Preservatives # of Bottles

FF=Field Filtered IA--Immunoassay

□ Iced ½ gal_____# □ H2SO4 ½ gal____# □ HNO3 ½ gal _____# □ Iced 1L AGl _____#

□ Iced ¼ gal_____# □ H2SO4 ¼ gal____# □ HNO3 ¼ gal _____# □ Iced P60mL_____# (IA)

□ Iced *125mL* FF_____# □ HNO3 ¼ gal FF_____# □ HCL 2x40mL AGl ___#

BIO SAMPLES COLLECTED

□ MB-I Inverts □ MB-EPT Inverts □ Fish IBI □Periphyton Chlorophyll *a* □Chlorophyll *a* *(Collected at 5ft or mid-depth whichever is less)* □ Other □ Fecal Coliform *(Collected 6-12 inches below surface)*

HABITAT ASSESSMENT TALLY FORMS

	Name of Collector / **Riffle / Run HA**	***Collector 1*** Score (LB/RB)	***Collector 2*** Score (LB/RB)
1	Instream Cover		
2	Epifaunal surface		
3	Embeddedness		
4	Velocity/Depth		
5	Channel Alteration		
6	Sediment Deposition		
7	Frequency of Riffles		
8	Channel Flow Status		
9	Condition of Banks		
10	Bank Veg. Protection	/	/
11	Disruptive Pressure	/	/
12	Riparian Veg. zone	/	/

	Name of Collector / **Glide / Pool HA**	***Collector 1*** Score (LB/RB)	***Collector 2*** Score (LB/RB)
1	Instream Cover		
2	Pool Substrate Char.		
3	Pool Variability		
4	Channel Alteration		
5	Sediment Deposition		
6	Channel Sinuosity		
7	Channel Flow Status		
8	Condition of Banks		
9	Bank Veg. Protection	/	/
10	Disruptive Pressure	/	/
11	Riparian Veg. Zone	/	/

COMMENTS