

Watershed Improvement Plan for Woodward Creek

September 30, 2011

Watershed: Oostanaula River

River Basin: Coosa

Water Body: Woodward Creek

Impaired Segment Location: Oostanaula River tributary

City or County: Floyd County

HUC 10: #0315010306

Criteria Violated: Fecal Coliform

303 (d) List Evaluation: 8 miles non-supportive for fishing;
82% reduction necessary.

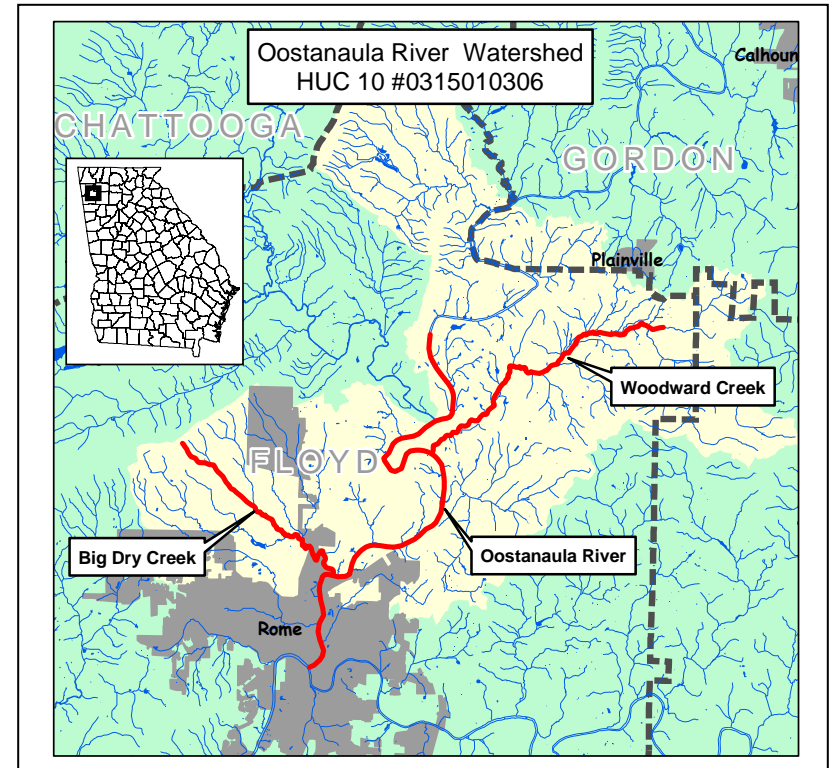


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1) Introduction

This Plan is intended to serve as a blueprint for implementing Best Management Practices for Woodward Creek in Floyd County and evaluating their success in reducing fecal coliform counts in the creek.

2) Segment and Watershed Description

The **Oostanaula River** watershed occupies 358,580 acres (excluding the Coosawattee and Conasauga land use areas) in Chattooga, Bartow, Floyd, Whitfield, Gordon and Walker counties. It begins at the confluence of the Conasauga and Coosawattee Rivers in Gordon County then flows southward towards Rome. The average width is about two hundred feet and banks range from fifteen to twenty feet high. The slope is relatively flat with a fall averaging about one foot per mile.

The City of Rome intake on the Oostanaula is the primary intake for the city's water supply. Over ten million gallons pass through this intake daily.

Land use : forest 74.0%, pasture/hay 14.7%, row crops 5.1%, "urban" 4.8%, mining 0.3%, wetlands 0.4%, and open water 0.7%. Data on land use was taken from Georgia DNR EPD publication *Total Maximum Daily Load Evaluation for Thirty-Four Stream Segments in the Coosa River Basin for PCBs in Fish Tissue* (2009). This is the most recent land use data available for this watershed.

Big Dry Creek is a tributary to the Oostanaula River. It headwaters within Berry College property, Mount Berry, Georgia and flows southeast to the river. Most of the watershed lies on Berry College property. Both dairy and beef cattle graze these lands as well as horses. In 2001 an Environmental Land Management Committee was formed to create a strategic plan for land use on the campus and surrounding properties. They maintain ponds on the grounds to absorb contaminated runoff before it can enter the stream. The horse barn has received some federal funding to fence out riparian buffers. A large portion of land is managed as a game preserve where hunting rights are leased and used to attract donors, etc.

Sinkholes appearing on Berry land over the years have been filled in with rock or dirt. The underlying karst topography may be responsible for the variable rates of flow for the stream at different locations and the unexpected appearance and disappearance of flow.

Mt. Berry Square Mall and parking area, directly adjacent to the stream, form a vast area of impervious surfaces in the watershed.

Opposite the mall, across Three Mile Rd., is a sewer line that extends along the bottom of the hill, running parallel to US 27 and coming within 50 ft. of the creek. During a heavy rain the sewer line has been observed overflowing. Those observations were not reported to EPD.

Woodward Creek headwaters in northeast Floyd County northwest of Highway 140 approximately two and a half miles from Shannon where it is a source of drinking water for the community. Shannon Water Treatment Plant originally operated by Galey & Lord has been purchased by Floyd County using a GEFA loan of \$1.3 million. It is reported that the creek flows year round and there are never periods when water cannot be withdrawn. It flows southwest through primarily low-lying land then south to the Oostanaula River.

3) Water Quality Impairment and Total Maximum Daily Load

Woodward Creek is impaired by fecal Coliform, and requires an 82% reduction.

STREAM SEGMENT NAME	LOCATION	MILES/AREA	DESIGNATED USE	PS/NS
Woodward Creek	Oostanaula River Tributary (Floyd County)	8	Fishing	NS

4) Visual Survey and Targeted Monitoring

(For complete Visual Survey, see appendix)

Kevin McAuliff / Jimmy Davis; Thursday, September 16, 2010; Weather: Clear and sunny, temperature in the 80's.

Updated July 21, 2011, Kevin McAuliff.

Woodward Creek rises near the Bartow County line, and flows through primarily agricultural and forested land before its confluence with the Oostanaula River. Floyd County has a water intake in Shannon, which occasionally is shut down due to low flow. During the course of the visual

survey, Operator Jimmy Davis frequently noted areas where he and others had had to destroy beaver dams, and indicated that there is a dense beaver population along the creek.

Bells Ferry Road crossing is adjacent to the Cooperative Extension Service's Northwest Georgia Experimental Station. The water is very slow moving, and the banks are eroded, precipitously in places. The water was tea colored in shallow areas to cloudy in deeper areas, but not opaque at the bridge site. Cattle are present in the vicinity, there was a large herd on the north side of the creek, east of the road, but a CRBI representative stated that the Station has implemented BMP's to keep cattle out of the water. Scattered herds were seen in nearby areas along Bells Ferry Road, including a large herd at the southeast corner of its intersection with Highway 140, an area that drains into the creek. A herd of cows was grazing above the precipitously eroded bank downstream from Bells Ferry Road.

Bells Ferry July 21, 2011 Update

NWGRC staff re-surveying Woodward Creek found conditions at the Bells Ferry crossing not significantly changed from the previous year. The water was higher and clearer than at the time of the previous year's survey.

Water at **the intake in Shannon** is slow flowing and tea colored, but clear. The surrounding area is wooded up to the creek bank, with no pasture or other potential non-wildlife sources of fecal coliform noted. Periodically, flows at this location drop low enough for the intake to be shut down.

Intake in Shannon July 21, 2011 Update

In a July 25, 2011 phone conversation, John Boyd, Rome-Floyd County Water Department Utilities Supervisor, told NWGRC staff that conditions at the intake in Shannon were unchanged from the previous year.

The **Minshew Road crossing** is in a wooded area that appears to be somewhat isolated, though there is a nearby lake, formerly used for recreation. Just downstream from the bridge, is an informal rock dam, apparently intended to raise the water level to create a swimming hole. The water at the site is shallow, tea-colored, and clear. No pasture land or other potential non-wildlife source of fecal coliform is evident in the vicinity, and there are no residences nearby.

Minshew Road July 21, 2011 Update

NWGRC staff re-surveying Woodward Creek found conditions at the Minshew Road Crossing not significantly changed from the previous year. The water was higher and clearer, and there was much aquatic vegetation that had not been there at the time of the last visit.

Tributary southwest of the intersection of Highway 140 and Thomas Bluff Road, is in a pine plantation, in which are two very large and modern chicken houses. According to the USGS Topographic Map, the chicken houses appear to be situated above or in a draw that drains into Woodward Creek. A branch downhill from the houses was evident on the property. There was no smell detectable on the property, but that the houses were modern and evidently very well-maintained, suggests that they are in use.

Water in the branch was shallow and clear.

Tributary southwest of the intersection of Highway 140 and Thomas Bluff Road July 21, 2011 Update

NWGRC staff did not access this private property in 2011.

The Earle Property is a fairly extensive holding of mostly forested land upstream from the Minshew Road crossing. The property is directly south of Enon Church on Highway 140, and there is what appears to be a partially harvested corn field visible to the south, between the highway and the creek. The same crop land can be seen from points on the Earle property, south of the creek.

The water is tea-colored, clear, and shallow at the points observed. The creek is accessible from the property only off of narrow dirt trails through the woods. There appear to be points of wildlife access along the banks. Jimmy Davis speculated that they could indicate the presence of beavers.

The Earle Property July 21, 2011 Update

NWGRC staff did not access this private property in 2011.

The Gaines Loop (USGS: Dixon Road) crossing is located upstream from the Earle property, southeast of Gaines Loop. The water is shallow, tea-colored, and clear. There are residential uses nearby, and a hayfield near the creek buffered by trees. Trails cross the tree buffer and slides down the bank are evidence that wildlife access the creek at this point. There is agricultural land in the vicinity, and there were herds on both the north and south sides of the road on the east side of the creek. It was not evident from the public right-of-way whether the cattle are fenced out of the creek or not.

Gaines Loop July 21, 2011 Update

NWGRC staff re-surveying Woodward Creek found conditions at the Gaines Loop Crossing not significantly changed from the previous year. The water was higher and murky, and the hay field was overgrown.

Northeast of the intersection of Peel Road (USGS: Norm Road) and Highway 140, are at least four chicken houses that are for sale along with 100+ acres of associated land. According to the USGS map, the houses sit just above several intermittent branches that drain into Woodward Creek. According to Sherri Teams of the National Resource Conservation Service, the owners of these chicken house implemented Best Management Practices years ago, and have routinely exceed ordinary standards.

The Highway 140 crossing on Woodward Creek is situated upstream from the Dixon Road/Gaines Loop crossing. The flow is sluggish, and the water cloudy, an appearance possibly due to the depth of the water at the bridge, since it does not appear cloudy in shallower stretches downstream. At the crossing, the creek flows through woods, but there are nearby agricultural uses, including the four vacant chicken houses noted above, and vacant pastures.

From the limited vantage afforded by the public right-of-way, there does not appear to be much livestock in the vicinity, or throughout much of this watershed, and pastures and hayfields here and elsewhere appear to be severely drought ravaged.

The Highway 140 crossing July 21, 2011 Update

The water was higher than the previous year, and somewhat murky. Last year, no cattle were seen, but on the more recent visit some were visible, though it was impossible to determine from the public right-of-way whether they had direct access to the water, or not. There was no significant change in the vicinity of the crossing since the 2011 visual survey.

Autry (USGS: Tanner) Road runs eastward from the Calhoun Highway (Highway 53) roughly parallel to Woodward Creek on the creeks north side. The creek is not visible from the public right-of-way, but appears to be well buffered with trees. There are a variety of residential uses, and a few head of cattle seen. A large agricultural outbuilding and multiple loading ramps suggest that in the past there have been large herds here, perhaps moved to other pastures or culled due to drought.

The Autry (USGS: Tanner) Road bridge crossing is located at the junction of Autry and Kirby Roads, within about 500 yards of the head of the stream at the Bartow County line. The area is rural and agricultural. There are a number of trailers within sight of the crossing, three of which sit within a few dozen feet of the creek. Along about half its path to this point, the Autry Road corridor is a wide clearing in the woods. East of the crossing, both Autry and Kirby Roads enter the woods where the creek originates. Some cattle were seen in a pasture adjacent to the creek, but there was no way to see if they were fenced out of the water or not.

At the crossing on the day of the site visit (September 23, 2010), there was a shallow pool on the upstream side of the bridge, but the bed appeared to be dry as far as it was visible from that point. The water was clear, but had little flow.

Autry Road July 21, 2011 Update

NWGRC staff noticed no significant changes from last year at this crossing. That there was water at the 2011 visit was a simple function of weather.

Recommended Targeted Monitoring Sites and Protocol

Bells Ferry Road Crossing

Label: Woodward Ck/Bells Ferry Rd

Name: Bells Ferry Road Crossing

Location Description: **Bells Ferry Road crossing** is adjacent to the Cooperative Extension Service's Northwest Georgia Experimental Station. The water is very slow moving, and the banks are eroded, precipitously in places. At the time of the visual survey on September 23, 2010, the water was tea colored in shallow areas to cloudy in deeper areas, but not opaque at the bridge site. Cattle are present in the vicinity, and there was a large herd on the north side of the creek, east of the road. A CRBI representative stated that the Station has implemented BMP's to keep cattle out of the water. Scattered herds were seen in nearby areas along Bells Ferry Road, including a large herd at the southeast corner of its intersection with Highway 140, an area that drains into the creek.

GPS lat/long coordinates: 30°20'36" N 85°06'37" W

Minshew Road Crossing

Label: Woodward Ck/Minshew Rd.

Name: Minshew Road Crossing

Location Description: The **Minshew Road crossing** is in a wooded area that appears to be somewhat isolated, though there is a nearby lake, formerly used for recreation. Just downstream from the bridge, is an informal rock dam, apparently intended to raise the water level to create a swimming hole. The water at the site is shallow, tea-colored, and clear. No pasture land or other potential non-wildlife source of fecal coliform is evident in the vicinity, and there are appear to be no residences nearby.

GPS lat/long coordinates: 34° 21' 22" N 85° 05' 40" W

Gaines Loop Crossing

Label: Woodward Ck/Gaines Loop

Name: Gaines Loop Crossing

Location Description: **The Gaines Loop** (USGS: Dixon Road) **crossing** is located southeast of the intersection of Gaines Loop and Crowder Road. At the time of the visual survey, the water was shallow, tea-colored, and clear. There are residential uses nearby, and a hayfield near the creek buffered by trees. Trails cross the tree buffer, and slides down the bank are evidence that wildlife access the creek at this point. There is agricultural land in the vicinity, and there were herds on both the north and south sides of the road on the east side of the creek. It was not evident from the public right-of-way whether the cattle are fenced out of the creek or not.

GPS lat/long coordinates: 34°21'51"N 85°04'22"W

Plainville Road Crossing

Label: Woodward Ck/ Plainville Road

Name: Plainville Road Crossing

Location Description: The **Plainville Road crossing** is located in a rural, agricultural setting. Surrounding pasture land seems to have no cattle on it, but two cows were seen in the water within 50 feet of the bridge. The adjacent pasture was fenced off from the creek, so the cows may have come from another nearby pasture not visible from the right-of-way.

At the time of the September 23, 2010 site visit, the shallow water was clear and flowing well. The creek at this point is vegetated to the bank. Next to the bridge on its northeast side is what appears to be a cattle access, but the adjacent pasture is fenced off from the creek.

GPS lat/long coordinates: 34°22'41"N 85°02'52"W

Autry Road Crossing

Label: Woodward Creek/Autry Rd.

Name: Autry Road Crossing

Location Description: The **Autry** (USGS: Tanner) **Road crossing** is located at the junction of Autry and Kirby Roads, within about 500 yards of the head of the stream at the Bartow County line. The area is rural and agricultural. There are a number of trailers within sight of the crossing, three of which sit within a few dozen feet of the creek. Along about half its path to this point, the Autry Road corridor is a wide clearing in the woods. East of the crossing, both Autry and Kirby Roads enter the woods where the creek originates. Some cattle were seen in a pasture adjacent to the creek, but there was no way to see if they were fenced out of the water or not.

At the crossing on the day of the site visit (September 23, 2010), there was a shallow pool on the upstream side of the bridge, but the bed appeared to be dry as far as it was visible from that point. The water was clear, but had little flow.

GPS lat/long coordinates: 34° 22' 46"N 85° 00' 35"W

Procedures

Staff Name: Kevin McAuliff

Staff affiliation: Northwest Georgia Regional Commission

Staff Qualifications: TBD

Methodology: TBD

Schedule

Sampling will be conducted monthly, contingent upon funding and its timing.

Quality Assurance

Names and affiliations of people providing training to field staff: TBD

Titles of training workshops, and dates attended by field staff: TBD

Rules for sample storage, transport, and disposal: TBD

Other steps to ensure quality assurance/ quality control:

Data Retention

Procedures for reporting and sharing data: Sampling data will be transmitted to EPD personnel within 24 hours after the results become available.

Location of data storage and duration: Data will be retained in the archives of the Northwest Georgia Regional Commission for a period of seven years, or as otherwise determined in consultation with EPD.

5) Identification and Ranking of Significant Sources of Impairment

PAC members agree that the likely sources of fecal Coliform contamination are as listed in the following table. While there has been no DNA or RNA testing to identify the host species, probable sources are generally observable. However, one PAC member recounted an anecdote about a friend who lived on a creek in a secluded location, and returned home from work one day to find a septic tank pump truck discharging into the creek. This illustrates the real likelihood of some FC contamination from unknown sources, and that possibility has been taken into consideration.

Lack of extensive targeted monitoring data is probably the greatest limiting factor in our ability to address sources of contamination. That occasional samples at a particular point show high concentrations of contaminants proves only that there is a source somewhere upstream, and even then, that source may not lie on the main stream, but on a minor and apparently insignificant tributary. A comprehensive monitoring program is an essential prerequisite for effectively addressing the problem.

Source	Extent (Length of impairment)	Magnitude of Contribution	Permit (Y/N)	Estimated contribution (1 – 5)	Stakeholder priority (1 – 5)	Comments
Wildlife	Throughout.	Considerable (65%)	NA	1	5	Little can be done about wildlife, overall, although beaver dams are sometimes destroyed, due to their interference with the public water supply.
Leaking septic systems	Throughout.	Small (10%)	NA	4	2	The watershed has not seen extensive residential development, and what has developed is not sewered.
Agricultural/ Livestock	Throughout.	Considerable (25%)	NA	2	1	NRCS administers BMP programs throughout the watershed. Participation is voluntary and widespread, and many conventional agricultural BMPs have been implemented. With education and financial incentives, producers who have been reluctant to participate could be convinced to implement BMPs, and current participants might expand their own BMP systems.
Unknown sources	Throughout.	Small (5%)	NA	3	4	Unknowable until discovered. One PAC member recounted an anecdote about a friend who lived on a creek in a secluded location, and returned home from work one day to find a septic tank pump truck discharging into the creek. There has also been speculation that abandoned industrial sites may be the location of pools of water where fecal coliform may result from various potential animal infestations.

6) Identification of Applicable Existing Management Measures

PARA-METER 2	MEASURE	RESPONSIBILITY	DESCRIPTION	SOURCE OF FUNDING	STATUS	ENACTED/ IMPLEMENTED	EFFECTIVENESS (Very, Moderate, Weak)
Fecal Coliform	Rules and regulations for onsite wastewater management (Septic system permitting)	Rome-Floyd County Department of Public Health	Regulates through permits and inspections of on-site sewage management systems; requires plumbers and other maintenance operators to submit monthly logs of pump-outs and maintenance done to systems	General Fund	Enforced	Ongoing	Very
FC	Sanitary Sewer Maintenance Program	Rome-Floyd County	Sanitary Sewer system inventory and inspection (mapping, television inspections); infiltration and inflow identification and reduction (flow monitoring, smoke testing); sewer line rehabilitation (pipe bursting, relining, cleaning) and manhole rehabilitation.	General Fund	Enforced	Ongoing	Very
FC	District-wide Septic System Maintenance	Floyd County Environmental Health, Northwest Georgia Health District	Expand ongoing education and outreach to promote proper maintenance of private septic systems using DVD program	District funds	Homeowners with existing septic systems	Recommended 2012	Moderate
FC	Acquisition and Preservation of Riparian Buffers	Rome-Floyd	Committee will buy land along Etowah River and plant or allow lands to return to original usage	SPLOST			Varies with extent of purchases

FC	Pollution Prevention Litter Removal	Rome-Floyd	Remove litter from County roads and properties using labor from State correctional facilities	General Fund	Ongoing		Very
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7) Recommended Additional Management Measures

BMP	Pollutant Source	Estimated Effectiveness	Estimated Load Reduction (%)	Cost Estimate	Public Support (1-5)	Install Priority	Comment
Implement Targeted Monitoring on Woodward Creek on a monthly basis and expand it to include selected tributaries.	FC from various non-point sources	This is a prerequisite for any effective FC reduction program.	No direct reduction.	\$24,000/year, base cost for Woodward Creek. \$4,000 /yr for each additional sampling site	1	1	Water quality monitoring has to be a keystone of any watershed improvement program. "Hotspots" must be located to determine the source of contamination. This cannot be done without a program of regular monitoring, which records not only FC levels, but also weather conditions for several days before each sample is taken.
Purchase water monitoring and testing equipment, both for fluoroscopic monitoring, and Adopt-A-Stream protocols.	FC from various non-point sources	This is a prerequisite for any effective FC reduction program.	No direct reduction.	\$1,300 for equipment, plus three years worth of	1	1	See comment above.

				supplies.			
Establish Adopt-A-Stream group to assist with water quality monitoring.	FC from various non-point sources						
Grant program to repair/replace failing septic systems	FC from failing septic systems	Moderate		\$4,700 /yr for reimbursement. Admin cost TBD.	1	4	There is no sewer for residential uses in the watershed, so all units are on septic systems, unless straight-piped.
Septic system owner education for system maintenance (required for receiving grant assistance)	FC from failing septic systems		NA	\$2,500	1	2	Will enhance program's chance of long-term success.
Identification and recruitment of additional stakeholders for the Partnership Advisory Group members	FC from various agricultural sources		NA	Staff time.	1	1	
Effective BMP education, marketing, and technical assistance. See Table 7 a., below.	FC from various agricultural sources	Slight	See Table 7 a., below.	TBD	1	3	Additional education, possibly one-on-one and on-site, will be necessary to implement further BMPs. This would be an initiative of Floyd County Cooperative Extension.
Agricultural BMP implementation. See Table 7 a., below.	FC from various agricultural sources	Very	See Table 7 a., below.	See Table 7 a., below.			This would be an initiative of Floyd County Cooperative Extension.
Effective Environmental Quality Incentives	FC from various	Slight	See Table 7 a., below.	\$3,500	1	4	See comment above.

Program (EQIP) education, marketing, and technical assistance	agricultural sources						
Establish controlled hunts for waterfowl	FC from waterfowl						
Establish beaver control program							

7.a) General Types of BMPs Likely to be Implemented

BMP	Estimated Load Reduction	Responsible Parties	Unit Cost
Vegetated buffers (wastewater treatment strip)	Reduces runoff of solids 80-90%	Floyd County Cooperative Extension	180-120/ac
Critical area treatment (mulch)	Analogous to vegetated buffers	Floyd County Cooperative Extension	1,320-1,920/ac
Fencing and use exclusion	Up to 99% reduction	Floyd County Cooperative Extension	1.08-1.50/lf
Alternative water sources	In conjunction with fencing up to 99%	Floyd County Cooperative Extension	105-210/trough; 1,500/pumping system; 1.8-3.6/ lf piping
Prescribed grazing		Floyd County	105-240/ac to

		Cooperative Extension	plant
Livestock stream crossings (pipe)	In conjunction with fencing up to 99%	Floyd County Cooperative Extension	3,840-6,060/ea
Streamside forest buffers	Analogous to vegetated buffers	Floyd County Cooperative Extension	330/ac
Composter (wood or steel frame)	On slopes up to 15%, can reduce runoff by 70%	Floyd County Cooperative Extension	9.45/lf

8) Partnership Advisory Council

Name/Organization	Title	Phone	Email		
John Boyd/ Floyd County W&S	Utilities Manager	(706) 291-5172 cell: (706) 252-5176	boydj@floydcountyga.org		
Eric Lindberg/Rome-Floyd Environmental Services	Director	(706) 236-4674	elindberg@romeomega.us		
Phil Worley/ UGA Livestock Experiment Station	Director	(706) 624-1398	pworley@uga.edu nwgastn@uga.edu		
Sherri Teems/ NRCS	District Conservationist	(706) 291-5651 x 3	Sheri.teems@ga.usda.gov		

Joe Cook/CRBI	Upper Coosa Riverkeeper	(706) 232-2724	jcook@coosa.org		
Clinton Agnew	CRBI Board	(706) 346-4885	chagnew@comcast.net		
Keith Mickler/ UGA Cooperative Extension	Floyd County Extension Agent	(706) 295-6210	Mickler@uga.edu		
Mike Pitts	Floyd County Environmental Health	(706) 295-6316	wmpitts@dhr.stste.ga.us		
Julia Knight	CRBI Member	(770) 334-6467	Julia@juliaknight.com		
David Gregory/ John's Mtn. WMA, GA DNR WRD	Wildlife Biologist	(706) 295-6041	David.gregory@dnr.state.ga.us		
Brent Womack/ John's Mtn. WMA, GA DNR WRD	Wildlife Biologist	(706) 295-6041	brent.womack@dnr.state.ga.us		

9) Public Involvement

The activity of the PAC constitutes public involvement.

10) Milestones

The intent of this Watershed Improvement Plan is to provide some structure for moving toward Woodward Creek's compliance with water quality standards by lessening the fecal coliform load. This will require an 82% reduction of that load.

Although BMPs have been widely implemented in the watershed, RC staff believe that further implementation of conventional measures is possible with additional education, possibly one-on-one and on-site. In addition, activities in the near future should include more intensive water quality monitoring to narrow down locations of fecal coliform sources, and to focus on likely sources, such as failing septic systems, that can be easily identified when owners seek assistance in remedying the problem.

In addition, the County’s Agricultural Extension Office should seek funding to undertake educational programs, perhaps conducted on one-on-one basis, to convince reluctant farmers to implement BMPs to reduce the amount of fecal coliform entering the waterways from their operations.

11) Recommendations for Monitoring and Criteria for Measuring Success

The lack of water quality data is the greatest impediment to gauging the success of BMP implementation. Targeted Monitoring should be undertaken as soon as funding becomes available to purchase equipment and supplies, train personnel, and fund actual monitoring activities. Experience suggests that volunteer labor is not sufficiently reliable to be entrusted with a task that must be performed on a regular basis over a long period of time. Monitoring must begin early enough to develop a realistic estimate of actual fecal coliform loads in waterways that are likely to be impacted by the implementation of BMPs, and must continue during and after BMP implementation.

If funding for targeted monitoring becomes available, it is possible that Regional Commission staff could carry out the monitoring program.

Specific recommendations for Monitoring are found in Section 4, “Visual Survey and Targeted Monitoring.” The criteria for measuring the success of BMPs will be the declines (or lack of the same) in fecal Coliform counts from before and during implementation to their post-implementation levels.

12) Plan Implementation

Measure	Year	Responsible Parties
Purchase fluorometer and incubator, and Adopt-A-Stream testing supplies, train personnel to operate systems, and initiate monitoring of Woodward Creek and selected tributaries	2014	NWGRC
Establish an Adopt-A-Stream group to implement water quality monitoring according to Adopt-A-Stream protocols	2014	Floyd County Cooperative Extension;

		Coosa River Basin Initiative; NWGRC
Identification and recruitment of additional stakeholders for the Partnership Advisory Group members (This will occur in conjunction with the Silver Creek Watershed Improvement Project.)	2012	NWGRC
Establish a grant program to assist owners of failing septic systems in undertaking repair replacement, and to provide maintenance education for participants	2015	NWGRC
Provide BMP education to convince reluctant farmers to implement appropriate BMPs.	2014	Floyd County Cooperative Extension; NRCS
Seek funding to implement a program to repair previously-installed deteriorated or damaged agricultural BMPs.	2014	Floyd County Cooperative Extension; NRCS
Establish controlled waterfowl hunts	2013	
Establish beaver control program	2014	

Plan Appendices

Nine Key Element Summary

One) Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed (e.g., X number of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

Causes of pollution that need to be addressed are found in § 3, “Water Quality Impairment and Total Maximum Daily Load,” and § 5, “Identification and Ranking of Significant Sources of Impairment” of the Watershed Improvement Plan.

Two) An estimate of the load reductions expected from management measures.

Estimated load reductions from recommended management measures are found in § 7, “Recommended Additional Management Measures” in the Watershed Improvement Plan.

Three) A description of the nonpoint source management measures that will need to be implemented to achieve load reductions in paragraph 2, and a description of the critical areas in which those measures will be needed to implement this plan.

A description of the nonpoint source management measures that will need to be implemented to achieve load reductions from recommended management measures are found in § 7, "Recommended Additional Management Measures" in the Watershed Improvement Plan.

Four) Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement this plan.

Cost estimates are found in § 7, "Recommended Additional Management Measures" in the Watershed Improvement Plan.

Five) An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented.

Information and education components are found in § 7, "Recommended Additional Management Measures" in the Watershed Improvement Plan.

Six) Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.

An implementation schedule is found in § 12, "Plan Implementation" of the Watershed Improvement Plan.

Seven) A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented.

A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented is in § 10, "Milestones."

Eight) A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.

Criteria for measuring success can be found in § 11, "Recommendations for Monitoring and Criteria for Measuring Success" of the Watershed Improvement Plan.

Nine) A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria

established under item h immediately above.

The monitoring component is found in § 4, “Visual Survey and Targeted Monitoring” of the Watershed Improvement Plan.

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