

EAST FORK PIGEON RIVER WETLANDS PROJECT

SCO ID 10-07350-01

HAYWOOD COUNTY, NORTH CAROLINA

Prepared for:

**NC DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ECOSYSTEM ENHANCEMENT PROGRAM
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FINAL WETLAND MITIGATION PLAN

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1.0 EXECUTIVE SUMMARY

MACTEC Engineering and Consulting, Inc. (MACTEC) was awarded a Design Contract (SCO ID 10-07350-01) for the East Fork Pigeon River Wetlands project by the North Carolina Ecosystem Enhancement Program (NCEEP) on July 27, 2010. Four deliverables were included under this contract; i.e., Delineation of Jurisdictional Surface Waters; Mitigation Plan Development; Informal Contract Documents; and Final Report and Record Drawings. The Wetland Mitigation Plan presented herein has been prepared by MACTEC to meet the second deliverable, Mitigation Plan Development.

The East Fork Pigeon River project site is a 15.73-acre parcel of land that is located to the south of the Town of Canton, in Haywood County, North Carolina (Figure 1). The project site can be reached via the following directions: (1) from Interstate 40 at Asheville, take Exit 37 to access US 19; (2) proceed south on U.S. 19 to Canton; (3) once in Canton, turn right to access Pisgah Drive (NC 110) and proceed along Pisgah Drive for approximately five miles; (4) turn left onto Cruso Road (US 276) and proceed for approximately two miles; (5) turn left onto Old Michael Road, which is a loop road with two points of access to Cruso Road; and (6) project site is located on the south side of Old Michael Road near the center of the loop.

The project site presently consists of a bottomland hardwood forest, numerous shrub and groundstory openings, and a small upland stand of eastern white pine (*Pinus strobus*) (Figure 2). Surface waters include a perennial stream channel, which occurs near the western project boundary, and the East Fork (of the) Pigeon River, which includes braided channels and overlaps the southern project boundary at multiple locations. The project site is owned by Ms. Helen Coleman. The NCEEP has obtained a conservation easement for the project site. The easement is held by the State of North Carolina and has been recorded at the Haywood County Courthouse. The Wetland Mitigation Plan and other project related components and details have been discussed between representatives of MACTEC (Mr. Richard Harmon, Mr. James Cutler, Mr. Josh Witherspoon, and Mr. Robert Sain) and Mr. Paul Wiesner of the NCEEP (Western Project Manager), during discussions held from April through September 2010.

The Wetland Mitigation Plan for the East Fork Pigeon River Wetlands project proposes wetland enhancement of a bottomland hardwood forest which encompasses the floodplain of the East Fork Pigeon River. Nuisance plant species have become established over time within the bottomland hardwood forest (jurisdictional wetlands) on site. The Wetland Mitigation Plan will present methods for the control of six (6) nuisance plant species. The Wetland Mitigation Plan will also include a planting program to install desirable wetland plant species within the jurisdictional wetland area. The elements of the nuisance

species control program and the planting plan will be approved by the NCEEP prior to implementation. The wetland enhancement will provide a quantified amount of NCEEP wetland mitigation credit for various permitted projects which occur within the same U.S. Geological Survey (USGS) 8-digit Hydrologic Unit Code (HUC). The East Fork Pigeon River Wetlands project is not proposed to off-set or mitigate for any particular project. MACTEC has prepared this Wetland Mitigation Plan for NCEEP to facilitate the enhancement effort of the jurisdictional wetlands on the East Fork Pigeon River project site.

Finally, with regard to watershed planning, the East Fork Pigeon River Wetlands project is located in the French Broad River Basin HUC 06010106010010. This HUC is identified as a Targeted Local Watershed (TLW) in NCEEP's 2009 French Broad River Basin Restoration Priority (RBRP): (http://www.nceep.net/services/restplans/French_Broad_RBRP_15july09.pdf).

Restoration goals identified in the 2009 French Broad Basin RBRP include:

- Implement wetland and stream restoration projects that reduce sources of sediment and nutrients by restoring riparian buffer vegetation, stabilizing banks, excluding livestock, and restoring natural geomorphology, especially in headwater streams.
- Restore and protect habitat for priority fish, mussel, snail, and crayfish species in the basin [see North Carolina Wildlife Resource Commission (WRC) (2005) for complete list].
- Cooperate with land trusts and resource agencies to help leverage federal and state grant funding for watershed restoration and conservation efforts.

Restoration goals and objectives for the East Fork Pigeon River Wetlands project include:

- Protecting the existing project wetlands and wildlife habitat with a permanent conservation easement.
- Enhancing the existing project wetlands and wildlife habitat by removing identified invasive plant species through manual and chemical methods and by planting native species within the project site.

2.0 WATERSHED PLANNING

2.1 Watershed Plan Description

The 2009 French Broad River Basin RBRP identified as 06010106010010, which includes the East Fork Pigeon River Wetlands project site, as a TLW. The East Fork Pigeon River watershed is the most forested of all TLWs in the French Broad, with 91% of the land in forest/wetland and 81% of the streams

with an aquatic buffer. About half of the land is in the Pisgah National Forest, where the headwaters of the East Fork are High Quality Waters. All streams in the watershed are Water Supply Waters. Restoration goals identified in the 2009 French Broad River Basin RBRP include:

- Implement wetland and stream restoration projects that reduce sources of sediment and nutrients by restoring riparian buffer vegetation, stabilizing banks, excluding livestock, and restoring natural geomorphology, especially in headwater streams.
- Restore and protect habitat for priority fish, mussel, snail, and crayfish species in the basin [see North Carolina WRC (2005) for complete list].
- Cooperate with land trusts and resource agencies to help leverage federal and state grant funding for watershed restoration and conservation efforts.

Portions of the East Fork Pigeon River serve as a refuge for high priority aquatic species that depend on high quality cool-warm water habitat (http://www.nceep.net/services/restplans/French_Broad_RBRP_15july09.pdf). The East Fork Pigeon River Wetlands project will protect approximately 14 acres of wetlands in the floodplain of the East Fork Pigeon River with a permanent conservation easement; therefore, this will protect floodplain function along this biologically rich river. In addition, the project will enhance existing wetlands by removing identified invasive plant species through manual and chemical methods and by planting native species within the project site.

3.0 PROJECT SITE WETLANDS

3.1 Jurisdictional Wetlands

The 15.73-acre East Fork Pigeon River project site is comprised of 13.95 acres of U.S. Army Corps of Engineers (USACE) jurisdictional wetlands and 0.96 acre of non-jurisdictional uplands (Figure 2). The jurisdictional wetlands include a bottomland hardwood forest with shrub and groundstory openings. The non-jurisdictional uplands include an eastern white pine community, which occurs near the western boundary of the project site, and linear areas of the shoulder (berm) of Old Michael Road, which extend along the western, northern, and eastern boundaries of the site. Jurisdictional surface waters include 1,411 linear feet (0.77 acre) of the East Fork Pigeon River and 664 linear feet (0.05 acre) of a perennial, unnamed tributary to the East Fork Pigeon River. The 0.05-acre perennial stream channel occurs near the western project boundary and flows to the south to a point of confluence with the East Fork Pigeon River. The point of confluence is located near the southwest corner of the project site. The East Fork Pigeon River enters the project site as a braided channel system at a point along the southern project boundary and leaves

the project site near the southwest corner of the site as a single thread channel system. Overall, the project site is bordered on the west, north, and east sides by Old Michael Road. The southern boundary of the project site abuts forested wetlands. The acreage values reported herein were based on the specific purpose survey of the project site, as conducted by Cavanaugh in October 2010. The descriptions of on-site plant communities were based on field observations made by MACTEC scientists during site visits conducted between April and October 2010.

Note: According to February 9, 2011 correspondence from NCEEP to MACTEC (i.e., *Draft Mitigation Plan Documents Review Comments*), the NCEEP is in possession of a land survey document of the Coleman property that was prepared by Joel Johnson Land Surveying (JJLS). The survey completed by JJLS presents a value of 18.10 acres for the total size of the Coleman tract, as including a boundary survey and a conservation easement survey. The conservation easement portion of the JJLS survey of the Coleman tract is 16.53 acres, which is the portion of the Coleman tract that has been put in a permanent conservation easement by the State of North Carolina. An area of 1.57 acres (i.e., the difference between 18.10 acres and 16.53 acres) occurs within the Coleman tract (parcel boundary), but in a right-of-way; therefore, these 1.57 acres cannot be deeded as conservation easement. The Project Area for the East Fork Pigeon River Wetland project is 15.73 acres. The Project Area represents the area of land that was examined to facilitate the preparation of the Wetland Mitigation Plan. During the initial review of the project in May 2010 between NCEEP and MACTEC, aerial photography of the project site boundary was provided by NCEEP. The site boundary on the NCEEP aerial photograph was used to delimit the Project Area. The Project Area boundary was surveyed by Cavanaugh in October 2010. The difference between the Project Area (15.73 acres) and the NCEEP recorded conservation easement (16.53 acres) is 0.8 acre. This value of 0.8 acre of land encompasses a small area of uplands along Old Michael Road.

Jurisdictional surface waters, including perennial and intermittent streams, wetlands, and other special aquatic sites, are defined by 33 CFR Part 328.3 and are protected by Section 404 and other applicable sections of the Clean Water Act (e.g., 33 USC 1344), which is administered and enforced by the USACE as well as other federal and state government agencies. MACTEC professional wetland scientists delineated the landward limits of jurisdictional waters of the U.S, including streams and wetlands, on the East Fork Pigeon River project site using the Routine Wetland Determination (Level 2 - Onsite Inspection Necessary) method as defined in the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory 1987). This technique uses a multi-parameter approach that requires positive evidence of hydrophytic vegetation, hydric soil, and wetland hydrology. MACTEC considered areas exhibiting the aforementioned three

wetland characteristics to be potentially jurisdictional surface waters and marked, with flagging tape, these areas in the field. Finally, to facilitate the identification of potentially jurisdictional surface waters on the project site, MACTEC reviewed readily and publicly available information sources, including the USGS 7.5-minute quadrangle topographic map, the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map (USFWS 2010), the Natural Resources Conservation Service (NRCS) soil survey for Haywood County, and relatively recent color aerial photography.

In the State of North Carolina, the USACE is the lead regulatory agency in regard to verification of the landward extent of jurisdictional surface waters. MACTEC coordinated the verification of jurisdictional surface waters with Mr. Tyler Crumbley of the USACE - Asheville Regulatory Field Office. Mr. Crumbley conducted the site inspection of the landward limits of USACE regulatory jurisdiction on October 6, 2010, with MACTEC professional wetland scientists in attendance. Following Mr. Crumbley's confirmation of the wetland delineation, the landward limits of the on-site jurisdictional surface waters were surveyed by Mr. David Alley of Cavanaugh, who is a registered Professional Land Surveyor in North Carolina. The signed and sealed, specific purpose survey of the landward limits of USACE regulatory jurisdiction for the East Fork Pigeon River project site was subsequently submitted to Mr. Crumbley for review. Supporting documents, which were prepared by MACTEC and submitted to Mr. Crumbley for review, included the completed Wetland Determination Data Form – Eastern Mountains and Piedmont Region (data point for wetland side and upland side) and the completed Approved Jurisdictional Determination Form (Rapanos form). The specific purpose survey and the supporting documents were approved by Mr. Crumbley. The USACE Notification of Jurisdictional Determination for the East Fork Pigeon River project site was issued on November 3, 2010, under Action Id No. 2010-01783. The Notification of Jurisdictional Determination is valid for a period of five years, with an expiration date of November 3, 2015. A copy of the specific purpose survey, as approved (signed) by Mr. Crumbley, and the aforementioned supporting documents are included herein as Appendix A.

3.2 Hydrological Characterization

The East Fork Pigeon River project site is located within the French Broad River Basin (USGS 8-digit HUC 06010106 [DWQ 2010; USGS 2010]). The project site is situated within the Federal Emergency Management Agency (FEMA) 100-year flood zone (Zone A7) according to Flood Insurance Rate Map (FIRM) Panel No. 370120 0190B (effective date July 15, 1984; FEMA 2010). The completed NCEEP Floodplain Requirements Checklist is included herein as Appendix B. It is presumed that the proposed activities for this project will not require a FEMA development permit. Drainage on the site is generally

to the south and west through the wetlands, the East Fork Pigeon River, and an unnamed perennial tributary to the East Fork Pigeon River. The East Fork Pigeon River is classified in the North Carolina Division of Water Quality, Basinwide Information Management System as a Water Supply III (WS-III) waterbody and Trout Waters (Tr).

Areas of the bottomland hardwood forest are shallowly inundated or saturated. According to personal communication with the landowner, Ms. Helen Coleman (October 4, 2010), the East Fork Pigeon River was historically located near the toe of Old Michael Road, along the northern and eastern property boundaries. The shift in this portion of the reach to the south, where the reach now exists, occurred a few decades in the past according to Ms. Coleman. The degree of change in the hydrologic regime from the historic condition to the current condition is not specifically known. The location of the historic reach near the southern shoulder of Old Michael Road is now occupied by a wetland drainageway. The western end of the drainageway abuts a metal culvert, which allows for the passage of water from the wetland drainageway to an unnamed perennial stream channel to East Fork Pigeon River located near the western project boundary.

Based on further personal communication with Ms. Coleman (October 4, 2010), the majority of the property was farmed in the past, with cessation of farming activities occurring a few decades ago. The farming activities most likely included the establishment of small ditches to facilitate drainage of the farm land. These drainage ditches do not appear to affect the current hydrology of the site. Some hydrologic enhancement has occurred on the project site for an unknown period of time due to the activities of beaver (*Castor canadensis*); i.e., because of two small dams within the eastern portion of the site. The beaver dams appear to contribute to the impoundment of surface water within the eastern portion of the bottomland hardwood forest. The various hydrologic changes through time have led to wetter site conditions since farming activities were abandoned. Wetter site conditions have facilitated the establishment of obligate wetland plant species on the project site.

Finally, other sources of hydrology for the project site include three culvert features which occur along Old Michael Road. Stream flow (stream channel runoff) or stormwater runoff from adjacent properties is conveyed onto the project site by these culverts. The locations of the three culverts are shown on Figure 2. The westernmost culvert conveys stream flow from an off-site, potentially jurisdictional, stream feature into the perennial stream channel that occurs near the western project boundary. The central culvert conveys stream flow from another off-site, potentially jurisdictional, stream feature into the

wetland drainageway that extends along the northern project boundary and Old Michael Road. The easternmost culvert (cross culvert) discharges stormwater into the aforementioned wetland drainageway.

3.3 Soil Characterization

According to the Natural Resources Conservation Service (NRCS), the project site is underlain by the Dellwood cobbly sandy loam, 0 to 3 percent slopes, occasionally flooded (DeA) map unit, which encompasses depressions and floodplains (landforms) (NRCS 2010). The NRCS considers this map unit to include hydric soil inclusions; i.e., small areas of Cullowhee or Nikwasi soils in depressions (NRCS 2010). The hydric criteria for this map unit is listed by the NRCS as '2B3'; i.e., soils that are poorly drained or very poorly drained and have a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 inches per hour in any layer within a depth of 20 inches. A MACTEC Licensed Soil Scientist confirmed, through on-site soil probing, that the wetland areas within the project site were underlain by hydric soils. The USACE confirmed the presence of hydric soils within the on-site wetlands during an October 6, 2010 site inspection conducted by USACE regulatory staff. The hydric soils observed in the field consisted generally of loam textures. Redoximorphic features (mottles) were observed within one foot of the existing ground surface. Finally, in regard to wildlife habitat, the Haywood County Soil Survey lists the Cullowhee and Nikwasi soil series as 'Good for Wetland Plants'. The surface horizons of these soils are generally loams and sandy loams with a pH ranging from 4.5 to 6.5. Based on the aforementioned rating of 'Good for Wetland Plants', it is presumed that no soil fertility amendments will need to be applied to the planting bed during the wetland planting operation. Soil fertility testing may be needed to determine actual soil fertility amendment rates, if needed.

3.4 Vegetation Community Type Description and Disturbance History

The distribution, structure, and species composition of the plant communities that occur on the East Fork Pigeon River project site partly reflect historic agricultural land use practices. The 13.95 acres of jurisdictional wetlands on the project site, which will comprise the proposed wetland mitigation area, consist of a bottomland hardwood forest with shrub and groundstory openings (Figure 2). These wetlands are areas of poorly-drained, seasonally saturated soils in lowlands abutting the East Fork Pigeon River. Areas of shallow seasonal pooling (i.e., areas of seasonal inundation of less than 6 inches) are also present within depressions on site. Based on the USFWS NWI map and the Cowardin classification protocols (Cowardin et al. 1979), the majority of the wetlands area on the project site is classified as Code PSS1A, or Palustrine, Scrub/Shrub, Broad-leaved Deciduous, Temporary Flooded. Based on the natural

community classification scheme for North Carolina by Schafale and Weakley (1990), the wetlands area on the project site would be classified as ‘Piedmont/Mountain Bottomland Forest’.

Within the scattered portions of the on-site bottomland hardwood forest that contain dominant or co-dominant overstory vegetation, the canopy stratum is comprised of sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), and red maple (*Acer rubrum*). Areas comprised of shrubs and areas dominated by groundstory plants are interspersed throughout the project site. These areas occur as openings within the bottomland hardwood forest. The shrub vegetation primarily includes black willow (saplings) and multiflora rose (*Rosa multiflora*). The groundstory is comprised of sedges, rushes, and herbaceous plants, such as swamp aster (*Aster puniceus*), soft rush (*Juncus effusus*), orange jewelweed (*Impatiens capensis*), false-nettle (*Boehmeria cylindrica*), sedges (*Carex* spp.), panic grass (*Panicum* sp.), blackberry (*Rubus* sp.), multiflora rose, seedbox (*Ludwigia* sp.), and duck-potato (*Sagittaria latifolia*). Many of these groundstory species also occur within the forested wetland portions of the project site.

Nuisance (invasive) plant species that occur within the bottomland hardwood forest on the East Fork Pigeon River project site include bamboo (*Phyllostachys* sp.), common cattail (*Typha latifolia*), multiflora rose, Japanese knotweed (*Reynoutria japonica*), Japanese honeysuckle (*Lonicera japonica*), and kudzu (*Pueraria montana*) (Figure 3). Three stands of bamboo are found in or adjacent to the project site. The larger stand (0.88 acre) of bamboo (Bamboo Area 1) is present within the eastern portion of the project site, along the northern bank of the East Fork Pigeon River. The other two stands of bamboo (0.10 acre and 0.18 acre) are present along the northern project boundary, along the southern shoulder of Old Michael Road (Bamboo Area 2) and the northern shoulder of the road (Bamboo Area 3). While both of these latter two stands of bamboo occur outside of the project boundary, they may serve as a seed source for this nuisance species. A scattered cattail area (0.61 acre [Cattail Area 1]) is present within the north-central portion of the project site, within a shallow inundated shrub/groundstory opening of the bottomland hardwood forest. Two smaller areas of cattail are also present on the project site: Cattail Area 2 (0.06 acre) occurs within the western portion of the project site and Cattail Area 3 (0.002 acre) exists near the southeast corner of the site. Kudzu occurs on, or abuts, the project site at three locations. Kudzu Area 1 (0.24 acre) abuts the northwest boundary of the project site along the southern shoulder of Old Michael Road, while Kudzu Area 2 (0.11 acre) and Japanese Knotweed/Kudzu Area (0.02 acre) occur within the southeastern portion of the site in the bottomland hardwood forest. Japanese knotweed is sparsely scattered within the southeastern portion of the project site. The two observed locations of Japanese knotweed include Japanese Knotweed Area 1 (0.06 acre) and Japanese Knotweed/Kudzu Area

(0.02 acre). Multiflora rose is scattered throughout the bottomland hardwood forest, under the forest canopy and within the shrub openings. Multiflora rose is the most common of the six nuisance plant species discussed herein, with regard to density and areal extent within the project site. Japanese honeysuckle is sparsely scattered throughout the bottomland hardwood forest of the project site. A dense patch of Japanese honeysuckle also occurs within an upland area that abuts the western boundary of the site, which is off site. The locations and areal limits of the aforementioned areas of nuisance plant species occurrence were obtained through global positioning system (GPS) technology, differentially-corrected to sub-meter accuracy, as conducted by MACTEC scientists on October 4 and 5, 2010. Taxonomic nomenclature for the aforementioned plant species is based on Weakley (2008).

3.5 Site Topography and Geology

Based on the review of the USGS topographic quadrangle (*Asheville, North Carolina*) for the East Fork Pigeon River project site, no distinct variation in topography is apparent across the site. An elevation (contour interval) of 2,760 feet mean sea level is depicted on the quadrangle along the north side of Old Michael Road and to the south of the southern project boundary. No contour interval is depicted on the quadrangle for the interior of the project site. More detailed topographic data for the project site are provided through the specific purpose topographic survey of ground elevations conducted by Cavanaugh in November 2010. The Cavanaugh field survey entailed the collection of ground elevation data at 100-foot grid intersections. The Cavanaugh survey drawing is presented in Appendix C. One-foot contour intervals are presented on the survey drawing. Based on the results of the topographic survey, the ground elevations ranged from approximately 2,760 feet at Old Michael Road, at the southeastern corner of the project site, to approximately 2,735 feet, at the southwestern corner of the site near the confluence of the East Fork Pigeon River and the unnamed perennial stream. Low contour intervals (low surveyed ground elevations), ranging from approximately 2,737 to 2,739 feet, occurred within the east-central portion of the project site where shallow pooling was observed. Another area of low contour intervals and shallow pooling occurred within the west-central portion of the project site, where the ground elevations ranged from 2,738 to 2,739 feet. The surveyed 2,740-foot contour interval generally extended through the western half of the project site.

With regard to the geologic setting, the project site is located in the Ashe Metamorphic Suite and Tallulah Falls Formation of the Blue Ridge Belt of North Carolina (NCGS 1985). This formation is underlain by muscovite – biotite gneiss. The East Fork Pigeon River is underlain by rocks of the Ashe Metamorphic Suite. The rocks in this suite developed over 700 million years ago from sediment layers of gravel, sand,

and silt. After the sediment layers were buried, compressed, and lithified into rock, they were metamorphosed to form the mica gneisses and schists that are seen in the suite today.

3.6 Site Photography

Ground level site conditions of the East Fork Pigeon River project site were photographed by MACTEC scientists during site visits conducted in April and October, 2010. The ground level site photography is presented in Appendix D.

4.0 PROJECT SITE MITIGATION PLAN

4.1 Mitigation Plan Goals and Objectives

The RBRP identified the following major stressors in the watershed: excess fecal coliform bacteria, nutrient enrichment, habitat fragmentation from impoundments, and habitat degradation associated with sedimentation, streambed scour, and streambank erosion.

Mitigation goals for the East Fork Pigeon River Wetlands project are to enhance and protect existing wetlands and wildlife habitat along the East Fork Pigeon River. These will address the RBRP goal of protecting habitat for priority species in the basin.

The project objectives include:

- Enhance existing wetlands by removing identified invasive plant species through manual and chemical methods and by planting native species within the project site.
- Protecting the project wetlands and on-site species with a permanent conservation easement.

4.2 Nuisance Plant Species Control

Based on site reconnaissance conducted by MACTEC wetland scientists from April through October 2010, wetland enhancement can be achieved for the East Fork Pigeon River project site through the control of nuisance plant species which currently inhabit the bottomland hardwood forest and shrub/groundstory open areas on site. MACTEC recommends that the control of nuisance plant species exclude the use of mechanized vehicular equipment. Mechanized vehicular equipment would most likely significantly disturb the soil substrate of the on-site wetlands. Furthermore, any opportunity to place fill material in the bottomland hardwood forest to facilitate the nuisance species control operation (providing ingress/egress of equipment) is not recommended, as this activity would likely entail the filling of jurisdictional wetlands and therefore require authorization by the USACE. With these considerations,

MACTEC recommends that the treatment of the aforementioned six nuisance plant species encompass a combination of hand clearing (cutting by machete and/or chainsaw) and herbicide application, as described below for each of the six nuisance plant species. A seven-year timeframe for the treatment of nuisance plant species is proposed.

The timing of herbicidal control methods for the six nuisance plant species on the project site will be dependent on the type of herbicide (chemical compound) and the target plant species. The window for optimum results may be narrower for one species compared to another. Furthermore, the “location” of the chemical application (i.e., stems, leaves, roots, etc.) varies among species. These factors will influence the implementation/duration of the nuisance species control operations when herbicidal control methods are employed.

By controlling the nuisance plant species the habitat for wildlife, the habitat for aquatic biota of the East Fork Pigeon River, production export, visual quality/aesthetics, and the uniqueness/heritage of the project site will be improved. To complement the nuisance plant species control efforts, increased diversification of native plant species will be provided through the planting of the wetlands on site with native bottomland hardwood tree species. The target goal for these efforts will be the vegetative enhancement of the existing wetland community on the East Fork Pigeon River project site.

4.2.1 Bamboo

Overview: The North Carolina Native Plant Society lists bamboo as having a ‘significant’ threat (Rank 2 category) to native plant communities in North Carolina (NCNPS 2010). Bamboo is native to Asia. Some species of bamboo were first introduced into the United States in the nineteenth century for ornamental purposes (SEPPC 2010). The control of non-native invasive bamboo must include the removal of as much of the root mass and rhizomes of the plant as possible. The use of power equipment (chainsaws) is recommended for larger areas of infestation. Containment can also be a fairly effective method of controlling bamboo. As the rhizomes of bamboo are fairly shallow (i.e., growing less than one foot deep in the soil), a barrier made of concrete, metal, plastic, or pressure-treated wood installed about 18 inches deep can prove effective. Bamboo rhizomes are not stopped by barriers but are merely reflected. Therefore, the areas surrounding the barriers should be monitored regularly for escaped rhizomes. As it will most likely be impossible to remove all pieces of bamboo, a follow-up treatment with herbicides is generally required. In conjunction with removal or containment, a non-selective herbicide with the active ingredient glyphosate (i.e., Roundup or Eraser) is commonly used. Glyphosate

does not have residual soil activity and will only kill plants that receive direct application. However, for glyphosate to be effective, the bamboo must be mowed or chopped and allowed to regrow until the new leaves expand. Glyphosate can then be applied to the leaves. Typically, one application of glyphosate will not eradicate a bamboo infestation. Therefore, it can potentially take two to three years to achieve complete control. For bamboo control next to creeks, wetlands, or other water sources where spray drift will contact the water, a glyphosate product labeled for use near water (Eraser AQ, Rodeo, Pondmaster, Aquamaster or Aquapro) is required. Aquatic formulations of glyphosate can be mixed with a non-ionic surfactant, such as Ortho X-77 or Southern Ag Surfactant for herbicides, to improve control (Ferrell et al. 2006).

Proposed Treatment: For Bamboo Areas 1, 2, and 3, the control operation should include: (1) the cutting of bamboo stalks by hand (machete) and/or chainsaw in the spring (June); (2) the disposal off site of the cut plant material; (3) the basal spraying of the cut bamboo stalks in October/early November, following leaf growth, with one of the aforementioned glyphosate products labeled for use near water; and (4) retreatment, if necessary. The eradication of Bamboo Areas 2 and 3, which occur off site, is recommended to prevent further recruitment of this nuisance species within the project site. More than one treatment may be necessary if the initial treatment does not eradicate all of the bamboo in the target areas.

4.2.2 Cattail

Overview: Common cattail is native to North America. No ranking of threat to native plant communities is assigned for cattail by the North Carolina Native Plant Society (NCNPP 2010). Herbicidal control methods generally provide suitable treatment of cattail. Two chemical compounds, diquat and glyphosate, are the most effective in controlling cattails and are approved for aquatic use. Diquat is a contact herbicide; therefore, complete coverage of the cattail is needed to eliminate the plant. This requires spraying the area of cattails from several directions, which is considered a drawback. Another drawback is that diquat does not travel through the plant and therefore does not reach the roots of the plant. Since the root system is not killed, new shoots will emerge from the roots the following year. Using diquat will require yearly applications. Glyphosate is a systemic herbicide; therefore, it will travel throughout the plant and kill both the roots and vegetative portions. Systemic herbicides are preferred in the elimination of perennial plants such as cattail. There is no need to spray from multiple directions when using glyphosate. Another advantage of glyphosate is that one application of this systemic herbicide can often eliminate a cattail stand (Lynch 2002).

Proposed Treatment: For Cattail Areas 1, 2, and 3, the control operation should entail the spraying of the target areas with glyphosate in mid-summer through early fall. A second treatment will most likely be necessary if the initial treatment does not eradicate all of the cattail in the target areas.

4.2.3 Japanese Knotweed

Overview: Japanese knotweed, native to Japan, was introduced into the United States prior to 1890. By the turn of the century, it was established in the eastern United States and was reported naturalized around Philadelphia, PA, Schenectady, NY, and Atlantic Highlands, NJ. Current distribution is from Newfoundland to Ontario, in many parts of the north and southeastern United States, and west to Minnesota and Iowa (SEPPC 2010). The North Carolina Native Plant Society lists Japanese knotweed as having a 'severe' threat (Rank 1 category) to native plant communities in North Carolina (NCNPP 2010).

Japanese knotweed spreads rapidly from stout long rhizomes. Seeds are distributed by water in floodplains, transported with fill dirt, and to a lesser extent are wind-blown. Once established, populations are quite persistent and can out-compete existing vegetation. Japanese knotweed can tolerate a variety of adverse conditions including full shade, high temperatures, high salinity, and drought. It is found near water sources, in low-lying areas, waste places, utility rights of way, and around old home sites. It can quickly become an invasive pest in natural areas after escaping from cultivated gardens. It poses a significant threat to riparian areas, where it can survive severe floods. Japanese knotweed typically takes advantage of areas disturbed by humans (or wildlife, such as beaver); i.e., areas affording ample sunlight and friable soil for the invasive roots. Therefore, the clearing of forested land should be avoided until the eradication of this species is completed. Mechanical control includes grubbing. Grubbing can be used for small populations or environmentally sensitive areas where herbicides cannot be used. The entire plant, including all roots and runners, is removed with a digging tool. Juvenile plants can be hand-pulled depending on soil conditions and root development. Any portions of the root system not removed will potentially resprout. All plant parts, including mature fruit, should be bagged and disposed of to prevent reestablishment. Herbicidal control methods (glyphosate or triclopyr) include the aforementioned foliar spray method or the cut stump method. The cut stump method can be used in areas where Japanese knotweed is aggressively established within or around non-target plants. The foliar spray method can be used to control large populations. It may be necessary to precede foliar applications with stump treatments to reduce the risk of damaging non-target species (Remaley and Barger 2003).

Proposed Treatment: For Japanese Knotweed Area 1 and the Japanese Knotweed/Kudzu Area, the control operation should entail the careful spraying of individual stems of the species with glyphosate or triclopyr in mid-summer through early fall. Juvenile plants may be hand-pulled; however, since there is a potential for resprouting from uncollected roots, herbicide application may provide better results. A second treatment will most likely be necessary if the initial treatment does not eradicate all of the Japanese knotweed in the target areas.

4.2.4 Kudzu

Overview: The North Carolina Native Plant Society lists kudzu as having a ‘severe’ threat (Rank 1 category) to native plant communities in North Carolina (NCNPP 2010). A native of Asia, kudzu was introduced into the United States at the Philadelphia Centennial Exposition in 1876. The Soil Erosion Service (later renamed the Soil Conservation Service) distributed approximately 85 million seedlings starting in 1933 in an effort to control agricultural erosion. In 1953, the United States Department of Agriculture removed kudzu as a cover plant and listed it as a common weed of the South in 1970. It is estimated that kudzu now covers seven million acres in the southeast. Distribution is as far north as Pennsylvania, Illinois, and Connecticut and from eastern Texas to central Oklahoma in the west. The largest infestations are found in Mississippi, Alabama, and Georgia (SEPPC 2010).

Kudzu is an aggressive vine which will occupy forest edges or disturbed areas, such as abandoned fields and roadsides. Mechanical control methods include grubbing or cutting. Grubbing, with a digging tool, will remove the entire plant, including the taproot. Removed vegetation should be destroyed by burning or bagging. As kudzu roots often extend five feet below ground, eradication by this method is very difficult and is primarily used for small initial incursions. With regard to cutting, the vines and runners are chopped just above the groundlevel and the cuttings are destroyed. Cutting does not typically kill roots and should only be used to control the spread of kudzu. Herbicidal control methods (glyphosate or triclopyr) include the cut stump method, foliar spray method, and the root crown method. The cut stump method can be used in areas where vines are established within or around non-target plants or where vines have grown into the canopy. The foliar spray method can be used to control larger populations. It may be necessary to precede foliar applications with stump treatments to reduce the risk of damaging non-target species. After the stems and leaves have been brought under control (i.e., all above ground portions of the plants have been effectively treated), further treatment should follow with the root crown method. For the root crown method, the young or resprouting stem of the plant is located down to the root. A digging tool

is then used to cut into the root crown. Herbicide is then applied to the main root crown and any below ground runners (Remaley and Barger 2003).

Proposed Treatment: For Kudzu Areas 1 and 2 and the Japanese Knotweed/Kudzu Area, the control operation should be completed using the cut stump method. Kudzu has infested the canopy stratum at all three target areas. The foliar spray method is not recommended because the population (areal coverage) of kudzu at these locations is not large and the non-target plants (trees) could be impacted. Kudzu Area 2 occurs near the East Fork Pigeon River and the foliar spray method would impact this surface water if spray drift occurred. A second treatment will most likely be necessary if the initial cut stump application does not eradicate all of the kudzu in the target areas.

4.2.5 Multiflora Rose

Overview: The North Carolina Native Plant Society lists multiflora rose as having a 'severe' threat (Rank 1 category) to native plant communities in North Carolina (NCNPP 2010). Multiflora rose was introduced from Japan, Korea, and eastern China in 1886 as rootstock for ornamental roses. In the 1930s it was widely promoted as a "living fence" for soil conservation and in wildlife programs. Present distribution is throughout the United States with the exception of the southeastern coastal plains, Rocky Mountains, and western desert areas. Multiflora rose invades natural areas, especially fields, floodplains, and light gaps in forests (SEPPC 2010).

Mechanical control methods for multiflora rose, such as mowing or cutting, can be used for small populations or environmentally sensitive areas where herbicides cannot be used. Repeated mowing or cutting will control the spread of multiflora rose, but will not eradicate it. Stems should be cut at least once per growing season as close to the ground as possible. Herbicidal control methods, such as the foliar spray method or the cut stump method, can be alternatively used. The foliar spray method is suited for large thickets of multiflora rose, where risk to non-target species is minimal. Glyphosate can be used for control; however, as a non-selective systemic herbicide, this chemical may kill non-target partially-sprayed plants. Triclopyr is a selective herbicide for broadleaf species; therefore, in areas where desirable grasses are growing under or around multiflora rose, triclopyr can be used without non-target damage. The cut stump method can be used to treat individual bushes or in situations where the presence of desirable species preclude foliar application (Remaley and Barger 2003).

Proposed Treatment: Multiflora rose is scattered throughout the bottomland hardwood forest, under the forest canopy and within the shrub openings. The control operation for multiflora rose will be labor intensive and will cost more than the control operations for the other nuisance plant species. The recommended treatment for the control of multiflora rose on the project site is the cut stump method. Under this method, individual bushes would be cut and treated with glyphosate or triclopyr herbicide (basal spraying). Herbicide applications of glyphosate and/or triclopyr, using the foliar spray method, are not recommended for the project site, as this method will deleteriously impact non-target, desirable, wetland plant species within the groundstory. More than one treatment may be necessary if the initial treatment does not eradicate all of the multiflora rose in the target areas. Due to the aggressive nature (recruitment) of multiflora rose and the prevalence of this species on the project site, the control program will most likely be more difficult to implement than the control programs for the other five nuisance species.

4.2.6 Japanese Honeysuckle

Overview: Japanese honeysuckle is a native of eastern Asia. It was first introduced into North America in 1806 in Long Island, NY. Japanese honeysuckle grows extremely rapidly and is virtually impossible to control in naturalized woodland edge zones due to its rapid spread via tiny fruit seeds. It forms a tall dense woody shrub layer that aggressively displaces native plants (SEPPC 2010). The North Carolina Native Plant Society lists Japanese honeysuckle as having a ‘severe’ threat (Rank 1 category) to native plant communities in North Carolina (NCNPP 2010).

The control of Japanese honeysuckle includes the following methods: mowing, grazing, prescribed burning, and herbicides. While grazing and mowing reduces the spread of vegetative stems, prescribed burns or a combination of prescribed burns and herbicide spraying appears to be the best way to eradicate this vine. Systemic herbicides which can be used for treatment include glyphosate (Rodeo for wetlands and Roundup for uplands) and triclopyr (Garlon). Other chemical compounds with varying levels of efficacy are available for use (MAEPPC 2010).

Proposed Treatment: The control of Japanese honeysuckle through careful herbicide spray application (glyphosate or triclopyr) in mid-summer through early fall is recommended for the project site. Mechanical control methods (mowing) or prescribed burning are not recommended for the control of Japanese honeysuckle within the wetland areas.

4.3 Wetland Planting Plan

The Wetland Mitigation Plan for the East Fork Pigeon River Wetlands project will entail the control of nuisance plant species and the installation of wetland plant species within the project site. After the nuisance species control program is completed, a portion of the jurisdictional wetlands will be planted in late winter with wetland tree species that are native to southern mountain wetlands. Figure 4 depicts the general boundary of the proposed wetland planting area based on aerial photography and groundtruthing. Approximately 8.31 acres of the total, jurisdictional, wetland area (13.95 acres) will not be planted, however. The wetland areas to be excluded from planting encompass: (1) the deepwater wetland drainageway which occurs along the southern shoulder of Old Michael Road; (2) the stream banks of East Fork Pigeon River (bankfull bench and spoil areas); and (3) the forested portions of the bottomland hardwood forest. Therefore, only the portion of the bottomland hardwood forest that is open and lacking an overstory of trees and large saplings/large shrubs will be planted. With these planting exclusions, the size of the proposed wetland planting area is approximately 5.64 acres. Based on qualitative observations of the species composition and density of the canopy and sapling/shrub strata of the bottomland hardwood forest during the 2010 field reconnaissance, the aforementioned 5.64-acre planting area lacks an intact overstory of hardwood tree species. Therefore, to restore the hardwood overstory, the planting of trees (seedlings) is necessary. The control of nuisance plant species is necessary to provide a suitable 'bed' for the planting of seedlings; i.e., competition for nutrients with nuisance species will be removed, as will the effects of too much shading.

Under the proposed wetland planting plan, the native wetland tree species will be installed at a density of 435 stems per acre (ten-foot centers). The plant material will be representative of the species composition of bottomland hardwood forested wetlands along the East Fork Pigeon River. The final selection of plant stock may be determined to some extent by availability. The selected tree species will consist of containerized and/or bare root stock protected by tree shelters (i.e., TUBEX® or Miracle Tube tree shelters). The tree shelters will provide protection from wildlife depredation, wind, or other natural influences. The tree seedling material that is recommended for installation on the East Fork Pigeon River Wetlands project is presented in Table 1 below. The palette of wetland tree species will be finalized before installation and after consultation with NCEEP.

Table 1. Proposed Plant Material for the East Fork Pigeon River Wetlands Project, Wetland Mitigation Plan, Haywood County, North Carolina.

Common Name	Scientific Name ¹	Number of Tree Seedlings to Plant ²	Wetness Tolerance ³
American Elm	<i>Ulmus americana</i>	409	FACW
Bitternut Hickory	<i>Carya cordiformis</i>	409	FAC
Cherrybark Oak	<i>Quercus pagoda</i>	409	FAC+
Green Ash	<i>Fraxinus pennsylvanica</i>	409	FACW
Sugarberry	<i>Celtis laevigata</i>	409	FACW
Swamp Chestnut Oak	<i>Quercus michauxii</i>	409	FACW-

¹ Taxonomic nomenclature based on Alan S. Weakley in *Flora of the Southern and Mid-Atlantic States*, March 8, 2010 Working Draft, University of North Carolina Herbarium.

² Values of number of seedlings to plant are based on: (1) a total of approximately 2,454 seedlings to install, with the installation of plant material equally divided among the six tree species selected for installation and (2) a proposed wetland planting area of approximately 5.64 acres and a planting density of 435 stems per acre.

³ Wetness Tolerance based on Plant Indicator Status in *National List of Plant Species That Occur in Wetlands (Region 2 - Southeast)*, Resource Management Group, Inc., 1999. Abbreviations: FACW = Facultative Wetland; FAC = Facultative.

Site preparation will be necessary prior to the planting of individual tree seedlings. The site preparation will include manual disking with shovels, spades, rakes, or other hand tools to remove or loosen the existing groundstory vegetation and create a suitable planting bed for seedlings. The portions of the on-site wetlands that contain minimal groundcover should not require site preparation. Minor field adjustments during planting operations are expected; i.e., moving the planting location of tree seedlings when obstacles are encountered, such as existing trees or shrubs, large logs, or stump holes.

The planting plan will exclude the installation of wetland plant material within any of the non-jurisdictional upland areas on the project site. The uplands include the eastern white pine community occurring near the western boundary of the site and the sloped areas extending along the southern shoulder of Old Michael Road. Bamboo Areas 2 and 3 occur outside the project boundary and encompass uplands; therefore, these areas will be planted with upland tree species common to the region, such as eastern white pine or white oak (*Quercus alba*).

Finally, the Wetland Mitigation Plan does not include any enhancement or restoration activities for the East Fork Pigeon River or the unnamed perennial stream that occurs within the western portion of the project site. These surface waters are essentially unimpaired and provide suitable habitat for endemic fish and benthic macro-invertebrates. However, it is recommended herein that these jurisdictional waters be considered as available preservation credit.

4.4 Beaver Control

During the April - October 2010 field reconnaissance, sign of beaver was observed, including tree and shrub girdling/cuttings, a lodge, and two dams (Figure 3) within the eastern portion of the bottomland hardwood forest. MACTEC recommends herein that the control of beaver, via acceptable trapping practices, be conducted on the project site during the wetland planting operations and for a period of at least seven (7) years following planting to ensure that depredation to the planted tree seedlings by beavers is minimized. This activity is necessary for the survivorship of the planted wetland species and the overall success of the wetland enhancement effort. NCEEP, or appointed State agency, shall be responsible for any long-term beaver control efforts on the project site.

4.5 Mitigation Assets

The potential mitigation assets that will be provided from the implementation of the Wetland Mitigation Plan for the East Fork Pigeon River Wetlands project are summarized in Table 2 below. Table 2 includes the following information:

- Linear feet of stream preservation and the corresponding (available and generated) Stream Mitigation Units (SMUs).
- Acreage of wetland preservation and the corresponding Wetland Mitigation Units (WMUs).
- Acreage of wetland enhancement and the corresponding WMUs.

Table 2. Potential Mitigation Assets for the East Fork Pigeon River Wetlands Project, Wetland Mitigation Plan, Haywood County, North Carolina.

Wetland/Stream Feature ¹	Mitigation Type	Quantity of On-site Habitat	Ratio	Mitigation Units ²
Perennial Stream	Preservation	664 linear feet	5:1	132 SMUs
East Fork Pigeon River	Preservation	1,411 linear feet	5:1	282 SMUs
Bottomland Hardwood Forest - Planted	Enhancement	5.64 acres	2:1	2.8 WMUs
Bottomland Hardwood Forest – Not Planted	Enhancement	0.02 acre	2:1	0.1 WMUs
Bottomland Hardwood Forest – Not Planted	Preservation	8.29 acres	5:1	1.6 WMUs

¹ Two wetland enhancement areas are proposed; i.e., a 5.64-acre area of bottomland hardwood forest habitat which is lacking a mature overstory (canopy and tall shrub strata) and is proposed for control of nuisance plant species followed by planting of tree seedlings (groundstory openings) and a 0.02-acre area of bottomland hardwood forest habitat with a mature canopy, which is infested with kudzu and Japanese knotweed (Japanese Knotweed/Kudzu Area), will be treated, but not planted.

The wetland preservation area (8.29 acres) includes the remaining portion of the bottomland hardwood forest habitat that is comprised of a canopy stratum and/or tall shrub stratum, which is proposed for control of nuisance plant species, but not the planting of tree seedlings.

² SMUs = Stream Mitigation Units; WMUs = Wetland Mitigation Units.

The NCEEP mitigation credit ratios that will be applied to this project are as follows:

- Stream preservation at 5:1 for SMUs.
- Wetland preservation at 5:1 for WMUs.
- Wetland enhancement at 2:1 for WMUs.

The following conditions apply to this project with respect to the mitigation assets:

- Mitigation credit will be created for preservation and/or enhancement of on-site wetlands and streams only; i.e., the preservation and/or enhancement of off-site areas will not yield any mitigation credit. The rationale for this determination is that a conservation easement will insure that management/maintenance activities for on-site mitigation areas are provided in perpetuity, while off-site mitigation areas have no such protection and management/maintenance activities can be discontinued at any time.
- Jurisdictional streams on the project site (i.e., streams occurring within the conservation easement) must have a 30-foot buffer from edge of bank on each side of the channel to be available for stream preservation credit.
- Wetland areas occurring within the project site that will be treated for nuisance species, but not planted, will receive preservation credit only. One exception is the Japanese Knotweed/Kudzu Area (0.02 acre), which occurs outside of the planting area; i.e., this area of nuisance species will receive enhancement credit for the control of nuisance species due to the aggressive nature of kudzu and the potential expansion of this species into the surrounding forested wetlands.
- The two areas of bamboo that occur along the north side of Old Michael Road, beyond the project site boundary (i.e., Bamboo Areas 2 and 3), will be controlled; however, no mitigation credit will be provided for this control effort as the two bamboo areas occur off-site, on other property.
- The area of kudzu that abuts the northwest boundary of the project site along the southern shoulder of Old Michael Road (Kudzu Area 1; 0.24 acre) will be controlled; however, no mitigation credit will be provided for this control effort as the kudzu occurs either outside the project site boundary or within uplands.
- Areas of nuisance species that occur within the 5.64-acre wetland planting area include: Bamboo Area 1 (0.88 acre); Cattail Area 1 (0.61 acre); Cattail Area 2 (0.06 acre); Kudzu Area 2 (0.11 acre); and Japanese Knotweed Area 1 (0.06 acre) (see Figures 3 and 4). Multiflora rose is scattered throughout the wetland planting area.

Figure 5 presents the proposed wetland and stream mitigation areas (i.e., the potential mitigation assets) for the East Fork Pigeon River Wetlands project, as including the perennial stream preservation reaches and the areas of wetland enhancement and wetland preservation within the bottomland hardwood forest and imbedded shrub openings.

5.0 PRELIMINARY MONITORING

The purpose of the wetland monitoring program for the East Fork Pigeon River Wetlands project is to determine the degree of success the project has achieved in meeting the objectives of providing wetland enhancement. Data on the survivorship, vitality, and growth of the planted vegetation, the areal coverage of nuisance plant species, and wildlife utilization can be gathered annually to show how well the proposed mitigation plan is working. At a minimum, the monitoring plan should include:

- Identify parties responsible for monitoring;
- Determine the data to be collected and reported, how often and for what duration;
- Define the assessment tools and/or methods to be used for monitoring;
- Determine the format for reporting monitoring data and assessing enhancement status (success criteria); and
- Identify monitoring schedule (monitoring will be conducted for a minimum period of five years).

It is presumed that the wetland monitoring program will incorporate the NCEEP CVS monitoring protocols to determine if success criteria for the planted species have been met through the enhancement efforts. At a minimum, either CVS Level 1 or CVS Level 2 monitoring (sample plots) will be conducted in the project wetlands. Ground level photography will be acquired to document site conditions in the wetlands. Monitoring activities will be conducted over a seven-year timeframe. Overall, the wetland monitoring program will be conducted in accordance with current NCEEP standards. Monitoring reports should contain a discussion of any deviations from baseline conditions and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situation.

6.0 SITE PROTECTION AND ADAPTIVE MANAGEMENT STRATEGY

6.1 Legal Protection of Wetland Mitigation Area

The wetland mitigation area will be protected through the establishment of a conservation easement. The NCEEP has obtained a conservation easement for the project site. The easement is held by the State of North Carolina and has been recorded at the Haywood County Courthouse.

6.2 Long-Term Management Responsibilities

Long-term management and maintenance of the wetland mitigation area will be assured through the placement of the conservation easement on the mitigation area. Formal management/maintenance of the wetland mitigation area beyond the monitoring period will be the responsibility of NCEEP. Ownership of the wetland mitigation area will reside with the landowner, Ms. Helen Coleman, or her respective assigns. If the wetland mitigation area should ever be sold, all appropriate protective mechanisms (which will have been recorded) would remain in effect and would remain with the site.

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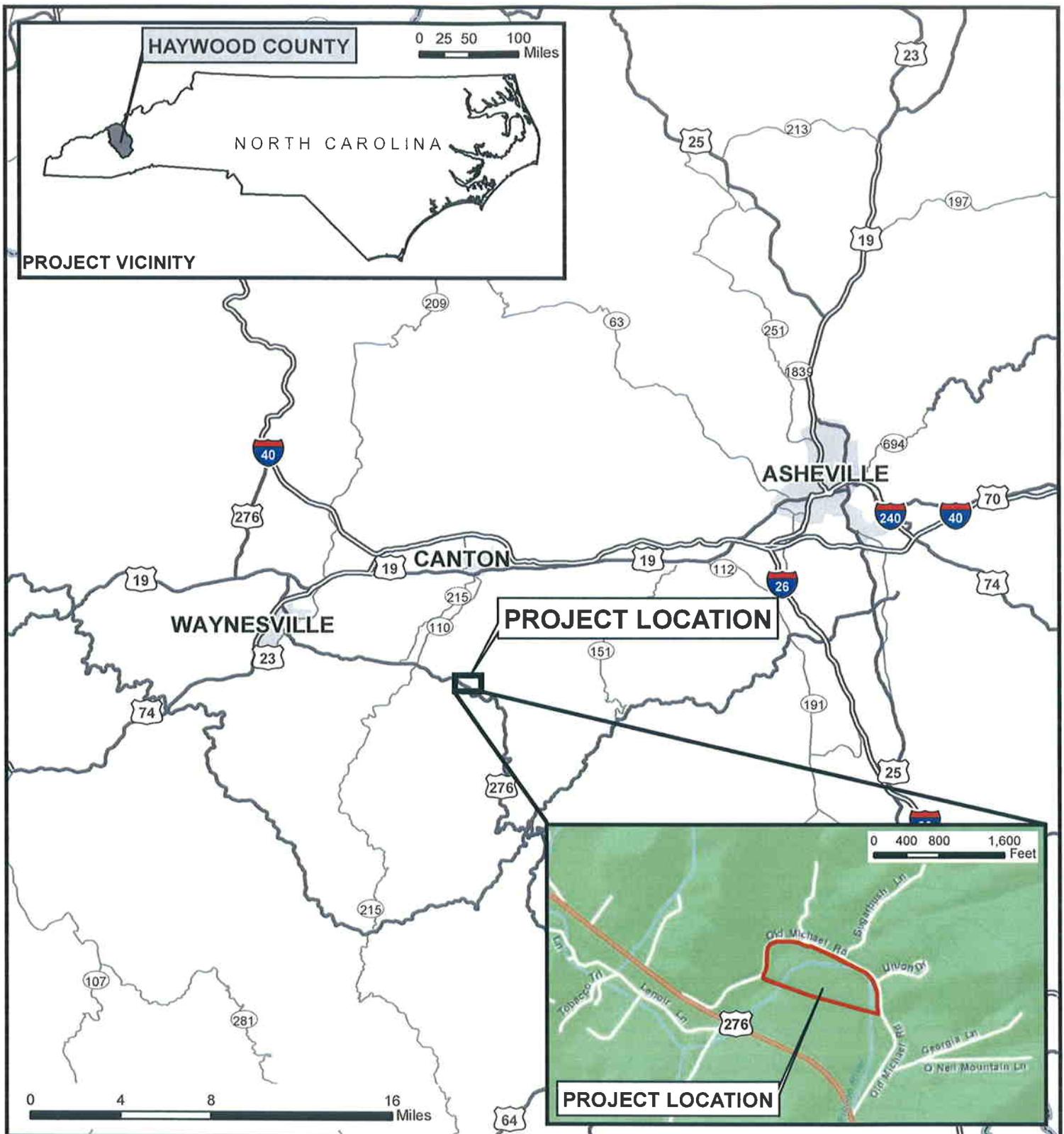
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FIGURES

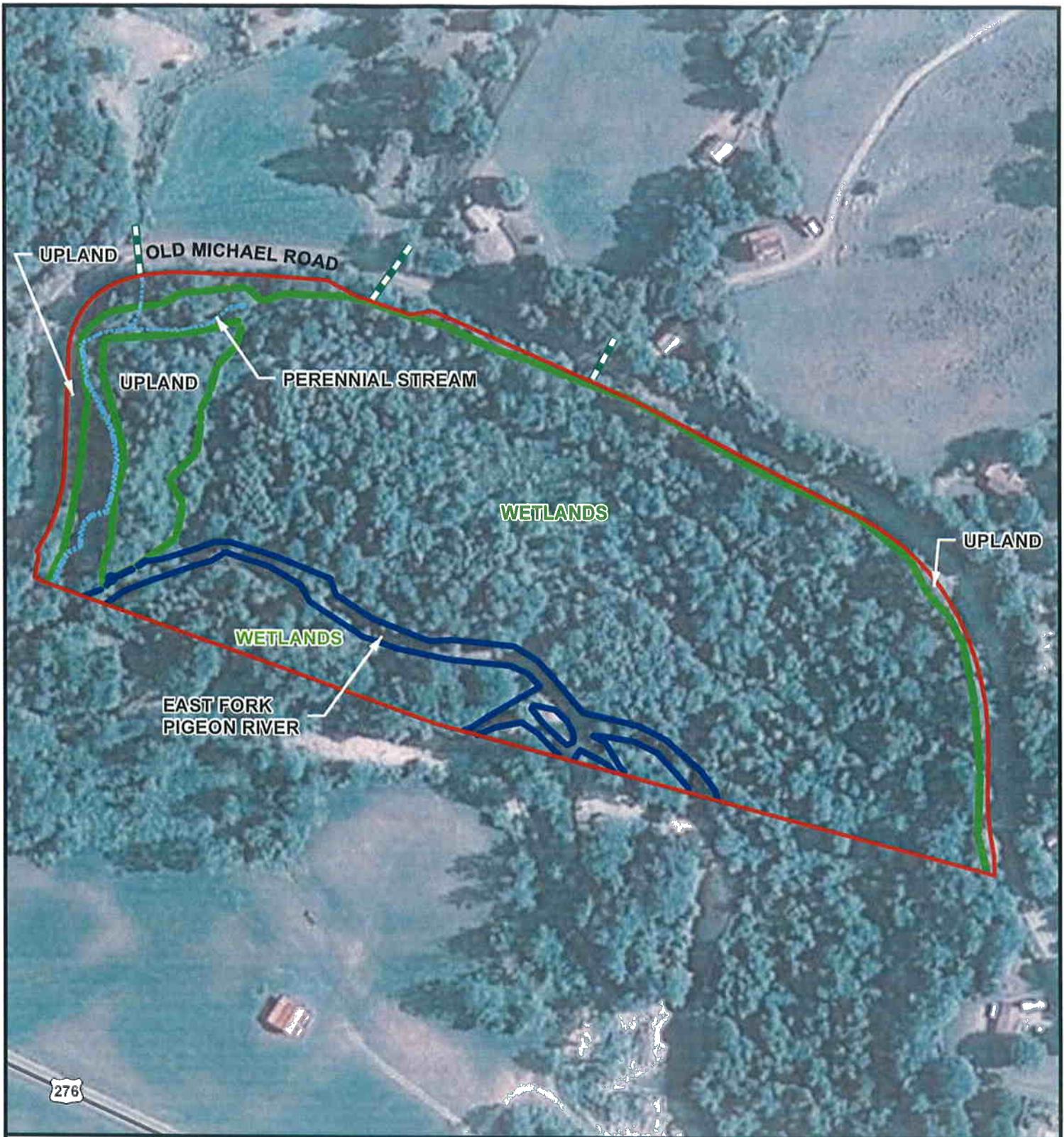


Source: <http://services.arcgisonline.com/ArcGIS/rest/services/Basemap/mapsserver>, dated 2010.



**PROJECT VICINITY MAP
EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY SJM	DATE 11/9/2010	CHECKED BY JDC	DATE 11/23/2010	JOB NUMBER 6470-10-0214	FIGURE 1
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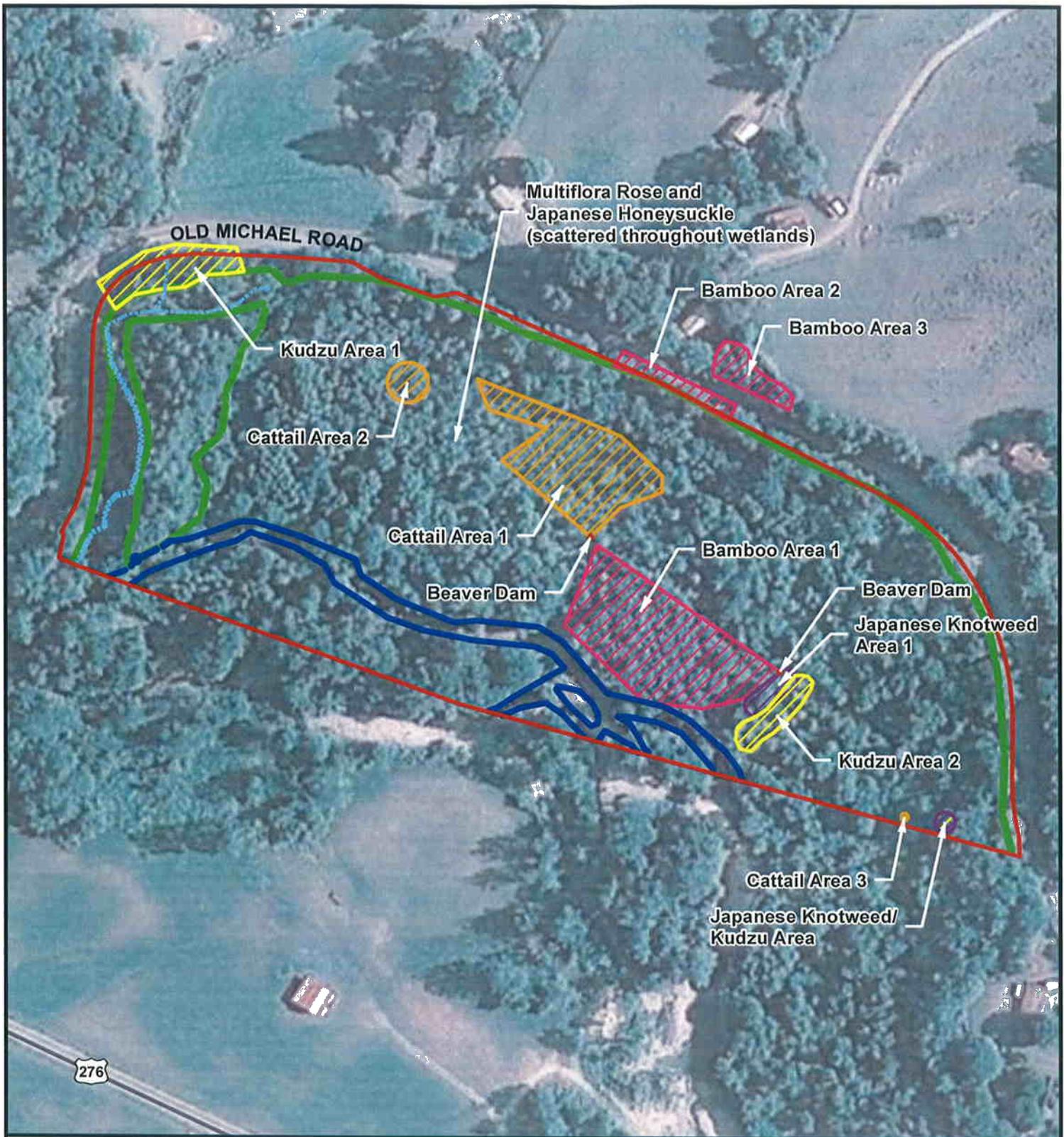
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— Project Boundary
 — Perennial Stream
 — East Fork Pigeon River
 — Wetland
 — Culvert



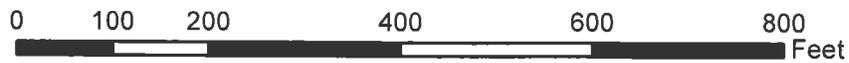
**JURISDICTIONAL SURFACE WATERS
 EAST FORK PIGEON RIVER WETLANDS PROJECT
 WETLAND MITIGATION PLAN
 HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY	SJM	DATE	11/9/2010	CHECKED BY	JDC	DATE	11/23/2010	JOB NUMBER	6470-10-0214	FIGURE	2
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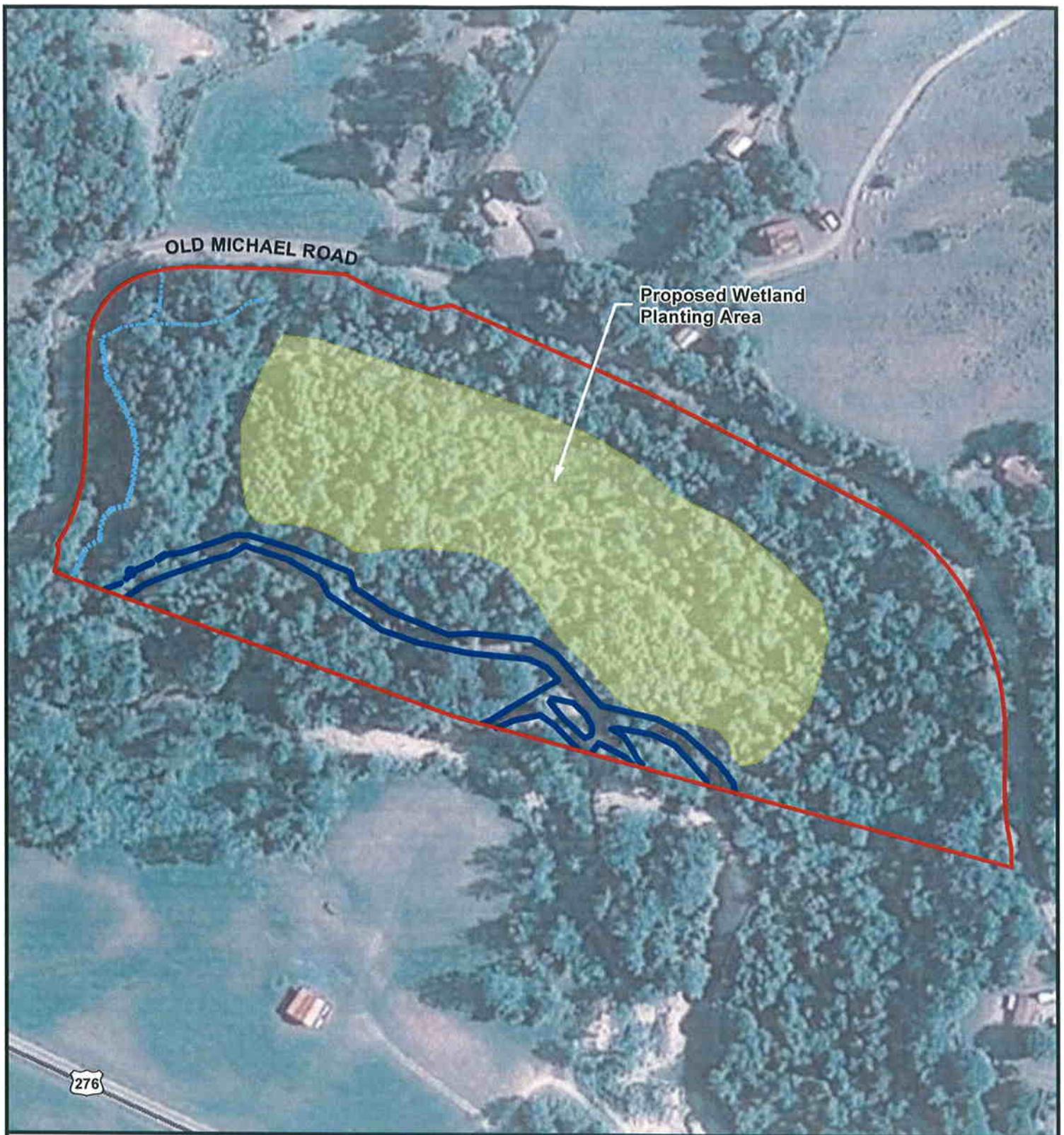
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— Project Boundary — East Fork Pigeon River - - - Perennial Stream — Wetland



**NUISANCE SPECIES AREAS
EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY SJM	DATE 11/9/2010	CHECKED BY JDC	DATE 11/23/2010	JOB NUMBER 6470-10-0214	FIGURE 3
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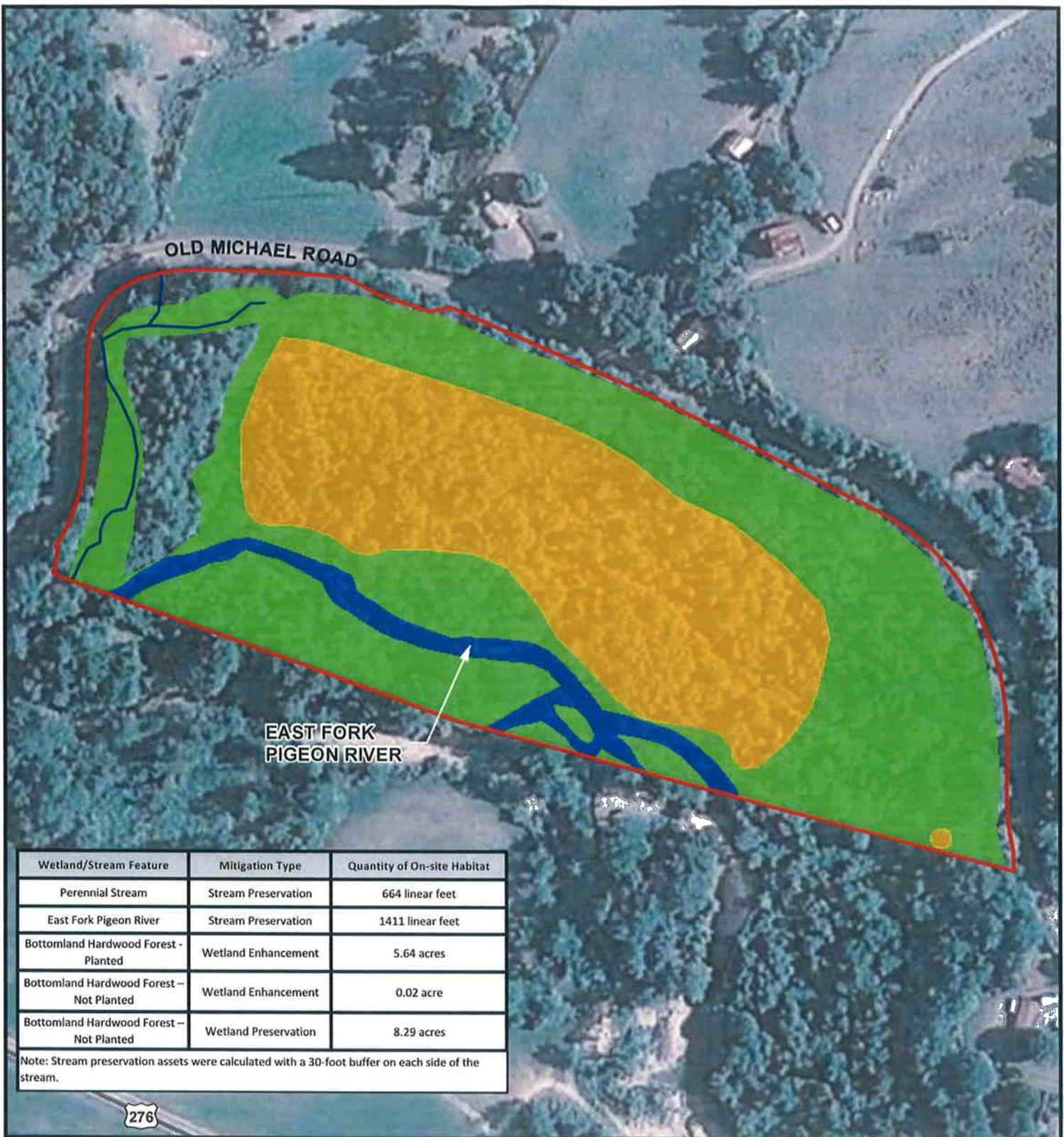
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— Project Boundary - - - Perennial Stream — East Fork Pigeon River



**PROPOSED WETLAND PLANTING AREA
EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY	SJM	DATE	11/9/2010	CHECKED BY	JDC	DATE	11/23/2010	JOB NUMBER	6470-10-0214	FIGURE	4
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Source: USDA FSA NAIP Aerial Photography, dated 2009.

— Project Boundary — Stream Preservation — Wetland Enhancement — Wetland Preservation



**PROPOSED WETLAND AND STREAM MITIGATION AREAS
EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY SJM	DATE 2/28/2011	CHECKED BY JDC	DATE 2/28/2011	JOB NUMBER 6470-10-0214	FIGURE 5
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APPENDIX A

USACE NOTIFICATION OF JURISDICTIONAL DETERMINATION

Copy furnished

**U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT**

Action Id: 2010-01783

County: Haywood

U.S.G.S. Quad: NC-Cruso

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner/Agent: MACTEC for Ms. Helen H. Coleman (owner)

Address: 7347 West Friendly Avenue, Suite E

Greensboro, NC 27410

Telephone No.: 336-294-4221

Property description:

Size (acres) 13.9 acres wetland and 2.076 LF streams Nearest Town Cruso

Nearest Waterway UT to East Fork of Pigeon River and East Fork of Pigeon River

River Basin French Broad

USGS HUC 06010106 Coordinates 35.4604492 N, -82.8431099 W

Location description The project site is located off Old Michael Road (SR 1885) along the East Fork of the Pigeon River in Cruso, Haywood County, NC. Coordinates in Decimal Degrees are: 35.460449 N, -82.8431099 W.

Indicate Which of the Following Apply:

A. Preliminary Determination

- Based on preliminary information, there may be waters and wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).

B. Approved Determination

- There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- There are waters and wetlands on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
 - We strongly suggest you have the waters and wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.
 - The waters and wetlands on your property have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.
- The waters and wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on 3 November, 2010. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- There are no waters of the U.S., to include wetlands, present on the above described property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

Action Id. 2010-01783

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Tyler Crumbley** at **828-271-7980**.

C. Basis For Determination

The site contains wetlands as determined by the USACE 1987 Wetland Delineation Manual and is adjacent to stream channels located on the property that exhibit indicators of ordinary high water marks. The stream channel on the property is an unnamed tributary to UT to East Fork of Pigeon River and East Fork of Pigeon River which flows into the French Broad River and ultimately flows to the Atlantic Ocean.

D. Remarks

E. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

Attached to this verification is an approved jurisdictional determination. If you are not in agreement with that approved jurisdictional determination, you can make an administrative appeal under 33 CFR 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Program
Attn: Tyler Crumbley, Project Manager
151 Patton Avenue, Room 208
Asheville, North Carolina 28801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by 2 January, 2011.

****It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.****

Corps Regulatory Official: Tyler Crumbley 

Issue Date: ~~Haywood~~
3 NOV 10

Expiration Date: 3 November, 2015

SURVEY PLATS, FIELD SKETCH, WETLAND DELINEATION FORMS, PROJECT PLANS, ETC., MUST BE ATTACHED TO THE FILE COPY OF THIS FORM, IF REQUIRED OR AVAILABLE.

Ms. Helen H. Coleman

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: MACTEC for Ms. Helen H. Coleman (owner)	File Number: 2010-01783	Date: 3 November, 2010
Attached is:		See Section below
<input type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input checked="" type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
 Tyler Crumbley, Project Manager
 USACE, Asheville Regulatory Field Office
 151 Patton Ave
 RM 208
 Asheville, NC 28806
 828-271-7980

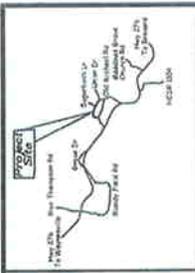
If you only have questions regarding the appeal process you may also contact:
 Mr. Michael F. Bell, Administrative Appeal Review Officer
 CESAD-ET-CO-R
 U.S. Army Corps of Engineers, South Atlantic Division
 60 Forsyth Street, Room 9M15
 Atlanta, Georgia 30303-8801

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:
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For appeals on Initial Proffered Permits and approved Jurisdictional Determinations send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Tyler Crumbley, Project Manager, Asheville Regulatory Field Office, 151 Patton Avenue, Room 208, Asheville, NC 28801.



VICINITY MAP
(N.T.S.)

THIS CERTIFIES THAT THIS COPY OF THIS PLAT ACCURATELY DEPICTS THE BOUNDARY OF THE JURISDICTION OF SECTION 404 OF THE CLEAN WATER ACT AS DETERMINED BY THE UNDERSIGNED ON THIS DATE, UNLESS THERE IS A CHANGE DETERMINED BY THE UNDERSIGNED ON THIS DATE. THIS SURVEY IS A CHANGE TO A SURVEY MADE BY THE UNDERSIGNED ON 08/17/2010. THE PERIOD NOT TO EXCEED FIVE YEARS FROM THIS DATE. THIS DETERMINATION WAS MADE USING THE 1987 CODES OF ENGINEERS WETLANDS DELINEATION MANUAL.

REGULATORY OFFICIAL
 NAME: Tyler Cantelero
 TITLE: Regulatory Specialist
 USAGE ACTION ID: STW 2010-0173

1. THIS PROPERTY IS SUBJECT TO ANY EASEMENTS (WRITTEN OR UNWRITTEN).
 2. THIS PROPERTY WAS SURVEYED WITHOUT THE BENEFIT OF A TITLE SEARCH AND THEREFORE MAY NOT SHOW ALL ENCUMBRANCES.
 3. ALL CORNERS ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
 4. THIS PROPERTY IS SHOWN AS OPEN 804-54-0076.
 5. DEED REFERENCES: DEED BOOK 452, PAGE 858
 6. AREA SHOWN HEREON WAS COMPUTED BY THE COORDINATE METHOD.
 7. WETLAND AREAS SHOWN HEREON WERE FLAGGED BY WATERS ENGINEERING AND CONSULTING, INC. ON OCTOBER 4-6, 2010, AND ARE SUBJECT TO THE ACCURACY THEREOF. THIS SURVEYOR ONLY CERTIFIES TO THE HORIZONTAL LOCATION OF THE AREAS FLAGGED BY WATERS ENGINEERING AND CONSULTING, INC.
 8. THE PURPOSE OF THIS SURVEY IS TO SHOW WETLAND DELINEATION AND FOR BOUNDARY AND AREA CALCULATION. THIS SURVEY IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE STATE OF NORTH CAROLINA EXTENDED ENHANCEMENT PROGRAM DATED AUGUST 17, 2010, PROJECT NUMBER: 10-050 AND RECORDED IN THE HAYWOOD COUNTY REGISTRY IN MAP CABINET "C", SLIDE 5802.

CALLS ALONG NON-JURISDICTIONAL AREA BOUNDARY

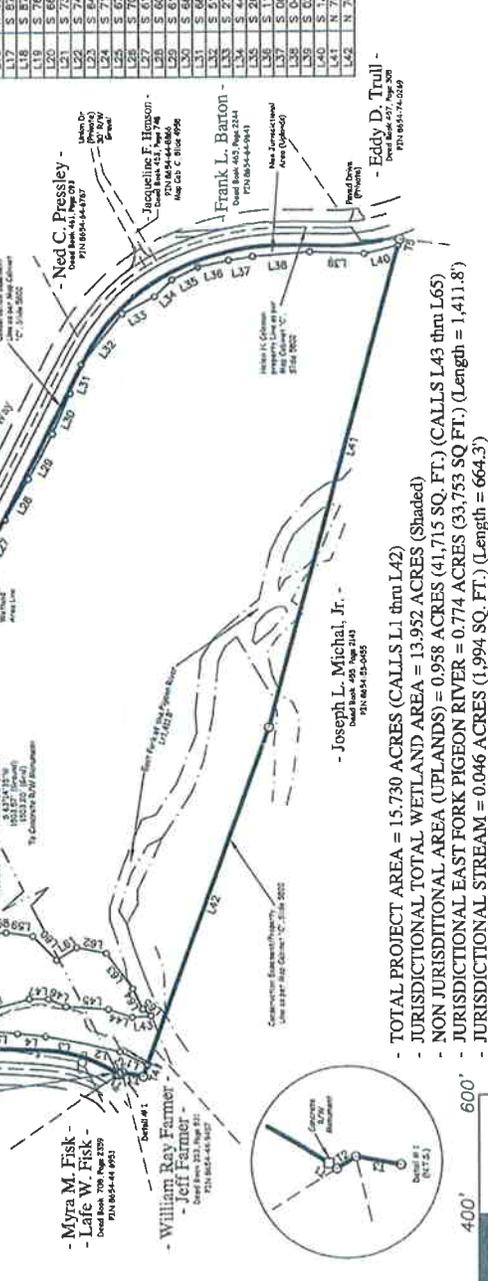
LINE	BEARING	DISTANCE
L43	N 04°29'35" W	31.89
L44	N 07°13'13" E	11.31
L45	N 23°19'43" E	32.27
L46	N 01°10'04" E	32.27
L47	N 12°39'56" W	120.45
L48	N 05°21'28" E	45.49
L49	N 86°19'20" E	101.53
L50	N 72°24'48" E	54.23
L51	S 07°28'02" E	7.41
L52	S 17°10'29" W	34.23
L53	S 43°39'49" W	37.53
L54	S 15°14'36" W	40.45
L55	S 20°03'46" W	39.34
L56	S 06°37'25" W	45.43
L57	S 49°43'04" W	58.00
L58	S 11°52'51" E	39.37
L59	S 11°43'35" W	51.45
L60	S 54°12'45" W	74.61
L61	S 62°59'29" W	39.82
L62	S 35°12'21" W	112.54

LEGEND:
 THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

- UNMARKED POINT
- EXISTING IRON REBAR W/2"X4" (R)
- 5" NEW IRON REBAR (NR)
- EXISTING IRON PIPE (EIP)
- PIPE SPIKE FOUND
- PK MARK FOUND
- PK MARK SET
- CONCRETE MONUMENT FOUND
- CONCRETE MONUMENT SET
- N/W RIGHT OF WAY
- C/V CENTER LINE
- N.T.S. NOT TO SCALE
- SUBJECT PROPERTY
- WETLAND AREA LINE
- TE LINE
- RIGHT OF WAY LINE
- LINE PLATTED FROM DEEDS OR RECORDED PLATS OR AS NOTED
- OVERHEAD POWER LINE
- STREAM
- RIVER
- GEODETIC CONTROL STA. / TE
- CONTROL CORNER
- ALL EXISTING AND NEW IRONS ARE FLUSH WITH THE GROUND UNLESS OTHERWISE NOTED.

CALLS ALONG JURISDICTIONAL AREA BOUNDARY

LINE	BEARING	DISTANCE
L1	N 20°21'13" E	51.27
L2	N 13°07'34" E	61.92
L3	N 10°57'27" E	66.00
L4	N 05°19'28" E	47.60
L5	N 05°53'45" E	54.25
L6	N 15°15'49" E	25.72
L7	N 52°00'29" E	34.65
L8	N 75°00'39" E	40.31
L9	N 82°57'31" E	38.50
L10	N 69°21'15" E	58.80
L11	N 87°43'48" E	25.00
L12	N 87°43'48" E	25.00
L13	N 86°41'48" E	25.41
L14	S 48°03'40" E	30.78
L15	N 89°23'51" E	33.89
L16	S 87°21'06" E	51.76
L17	S 87°45'17" E	42.78
L18	S 78°30'29" E	33.89
L19	S 78°30'29" E	33.89
L20	S 73°09'39" E	51.53
L21	S 73°09'39" E	51.53
L22	S 74°34'54" E	37.42
L23	S 84°29'47" E	79.95
L24	S 71°43'31" E	64.33
L25	S 67°31'26" E	109.73
L26	S 70°13'59" E	79.30
L27	S 67°12'22" E	79.30
L28	S 67°12'22" E	79.30
L29	S 61°30'29" E	65.22
L30	S 67°06'37" E	73.83
L31	S 67°06'37" E	51.53
L32	S 61°01'30" E	109.73
L33	S 44°10'39" E	46.58
L34	S 26°08'46" E	48.76
L35	S 11°55'08" E	53.06
L36	S 08°54'05" E	46.92
L37	S 08°54'05" E	46.92
L38	S 08°54'05" E	46.92
L39	S 08°54'05" E	46.92
L40	N 74°50'55" W	841.10
L41	N 74°50'55" W	841.10
L42	N 70°02'30" W	807.04



- TOTAL PROJECT AREA = 15.730 ACRES (CALLS L1 thru L42)
 - JURISDICTIONAL TOTAL WETLAND AREA = 13.952 ACRES (Shaded)
 - NON JURISDICTIONAL AREA (UPLANDS) = 0.958 ACRES (41,715 SQ. FT.) (CALLS L43 thru L65)
 - JURISDICTIONAL EAST FORK PIGEON RIVER = 0.774 ACRES (33,753 SQ. FT.) (Length = 1,411.8)
 - JURISDICTIONAL STREAM = 0.046 ACRES (1,994 SQ. FT.) (Length = 664.3)

I, DAVID K. ALLEY, CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL FIELD SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 452, PAGE 952 AND MAP CABINET "C", SLIDE 5802). THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION IN BOOK, PAGES "AS SHOWN"; THAT THE RATIO OF PRECISION IS "1:20,000"; AND THAT THIS MAP MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 56.1600).

THIS 28TH DAY OF OCTOBER, 2010

N. C. PROFESSIONAL LAND SURVEYOR L-4492

THE LINES CALLS

LINE	BEARING	DISTANCE
T1	S 35°21'57" W	2.60
T2	E 25°00'00" S	2.60
T3	S 31°52'24" E	6.28
T4	S 10°28'28" W	38.20
T5	N 74°50'55" W	19.87
T6	N 74°50'55" W	10.96

SURVEY FOR:
 State of North Carolina
 Ecosystem Enhancement Program
 East Fork of the Pigeon River Wetlands
 NC BEP Project Number: 94203
 SPO File Number: 044-p
 Current Owner: Helen Holcombe Coleman
 EAST FORK TOWNSHIP, HAYWOOD COUNTY, NORTH CAROLINA

DATE: October 25, 2010
 SCALE: 1" = 200'
 DRAWN BY: DKA
 CHECKED BY: DKA

NOBELS LICENSE NO. G-1973

CAVANAUGH
 Solutions through Integrity and Partnership

Cavanaugh & Associates, P.A.
 2386/1250 6007 Inc. 252/779-1005 www.cavanaughpa.com



APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Asheville

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Project area = 15.73 acres
State: North Carolina County/parish/borough: Haywood City: Canton
Center coordinates of site (lat/long in degree decimal format): Lat. 35.4606° **N**, Long. -82.8430° **W**.
Universal Transverse Mercator:

Name of nearest waterbody: East Fork of Pigeon River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pigeon River

Name of watershed or Hydrologic Unit Code (HUC): French Broad / USGS Cat. Unit No. 06010106

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date:

Field Determination. Date(s): October 6, 2010 site inspection conducted with Mr. Tyler Crumbley, USACE, Asheville.

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

TNWs, including territorial seas

Wetlands adjacent to TNWs

Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs

Non-RPWs that flow directly or indirectly into TNWs

Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

Impoundments of jurisdictional waters

Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: 2,076 linear feet: variable width (ft) and/or 0.820 acres.

Wetlands: 13.952 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual

Elevation of established OHWM (if known): .

2. Non-regulated waters/wetlands (check if applicable):³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
Explain: .

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: _____

Summarize rationale supporting determination: _____

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": _____

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: _____ inches
Average annual snowfall: _____ inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

- Tributary flows directly into TNW.
- Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: _____

Identify flow route to TNW⁵: _____
Tributary stream order, if known: _____

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

- Tributary is: Natural
 Artificial (man-made). Explain:
 Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **1:1**

Primary tributary substrate composition (check all that apply):

- | | | |
|--|--|-----------------------------------|
| <input type="checkbox"/> Silts | <input type="checkbox"/> Sands | <input type="checkbox"/> Concrete |
| <input type="checkbox"/> Cobbles | <input type="checkbox"/> Gravel | <input type="checkbox"/> Muck |
| <input type="checkbox"/> Bedrock | <input type="checkbox"/> Vegetation. Type/% cover: | |
| <input type="checkbox"/> Other. Explain: | | |

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: **1:1**

Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: **1:1**

Estimate average number of flow events in review area/year: **1:1**

Describe flow regime:

Other information on duration and volume:

Surface flow is: **1:1**. Characteristics:

Subsurface flow: **1:1**. Explain findings:

- Dye (or other) test performed:

Tributary has (check all that apply):

- | | |
|---|---|
| <input type="checkbox"/> Bed and banks | |
| <input type="checkbox"/> OHWM ⁶ (check all indicators that apply): | |
| <input type="checkbox"/> clear, natural line impressed on the bank | <input type="checkbox"/> the presence of litter and debris |
| <input type="checkbox"/> changes in the character of soil | <input type="checkbox"/> destruction of terrestrial vegetation |
| <input type="checkbox"/> shelving | <input type="checkbox"/> the presence of wrack line |
| <input type="checkbox"/> vegetation matted down, bent, or absent | <input type="checkbox"/> sediment sorting |
| <input type="checkbox"/> leaf litter disturbed or washed away | <input type="checkbox"/> scour |
| <input type="checkbox"/> sediment deposition | <input type="checkbox"/> multiple observed or predicted flow events |
| <input type="checkbox"/> water staining | <input type="checkbox"/> abrupt change in plant community |
| <input type="checkbox"/> other (list): | |
| <input type="checkbox"/> Discontinuous OHWM. ⁷ Explain: | |

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

- | | |
|--|--|
| <input checked="" type="checkbox"/> High Tide Line indicated by: | <input checked="" type="checkbox"/> Mean High Water Mark indicated by: |
| <input type="checkbox"/> oil or scum line along shore objects | <input type="checkbox"/> survey to available datum; |
| <input type="checkbox"/> fine shell or debris deposits (foreshore) | <input type="checkbox"/> physical markings; |
| <input type="checkbox"/> physical markings/characteristics | <input type="checkbox"/> vegetation lines/changes in vegetation types. |
| <input type="checkbox"/> tidal gauges | |
| <input type="checkbox"/> other (list): | |

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷Ibid.

(iv) **Biological Characteristics. Channel supports (check all that apply):**

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. **Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW**

(i) **Physical Characteristics:**

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List**.

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) **Chemical Characteristics:**

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) **Biological Characteristics. Wetland supports (check all that apply):**

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. **Characteristics of all wetlands adjacent to the tributary (if any)**

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)

Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:

TNWs: linear feet width (ft), Or, acres.

Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**

Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Rationale: The subject tributary (RPW) is identified as the East Fork of Pigeon River. At the project site location, this tributary was classified by MACTEC scientists as a perennial stream based on the protocols in NCDENR DWQ document "Methodology for Identification of Intermittent and Perennial Streams and Their Origins, Version 4.1." This perennial stream (RPW) is mapped as a blue line feature on the USGS topographic quadrangle. The stream (RPW) flows into the Pigeon River, which is presumed to be the TNW. Finally, a smaller, unnamed tributary of the East Fork of Pigeon River occurs along the western boundary of the project site. This unnamed stream channel was characterized as perennial based on the aforementioned DWQ protocols.

- Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: **2,076** linear feet **variable** width (ft).
 Other non-wetland waters: _____ acres.
Identify type(s) of waters: _____

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: _____ linear feet _____ width (ft).
 Other non-wetland waters: _____ acres.
Identify type(s) of waters: _____

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: **Rationale: Based on the Cowardin Classification, the jurisdictional wetlands occurring within the project site are characterized as Palustrine forested broad-leaved deciduous (PFO1), Palustrine scrub/shrub broad-leaved deciduous (PSS1), and Palustrine emergent persistent (PEM1). These wetlands directly abut the bank of the RPW (i.e., the East Fork of Pigeon River) along the southern project boundary, as determined by direct visual observation made during the wetland delineation field effort.**

- Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: _____

Provide acreage estimates for jurisdictional wetlands in the review area: **13.952** acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: _____ acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: _____ acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from “waters of the U.S.,” or
 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

⁸See Footnote # 3.

⁹To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain: _____
- Other factors. Explain: _____

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: _____ linear feet _____ width (ft).
- Other non-wetland waters: _____ acres.
Identify type(s) of waters: _____
- Wetlands: _____ acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in “SWANCC,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).
- Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain: _____
- Other: (explain, if not covered above): _____

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): _____ linear feet _____ width (ft).
- Lakes/ponds: _____ acres.
- Other non-wetland waters: _____ acres. List type of aquatic resource: _____
- Wetlands: _____ acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): _____ linear feet, _____ width (ft).
- Lakes/ponds: _____ acres.
- Other non-wetland waters: _____ acres. List type of aquatic resource: _____
- Wetlands: _____ acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Wetland/Stream Survey prepared by PLS (encl.).
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters’ study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: See MACTEC JD request package provided to USACE (09/2010).
- USDA Natural Resources Conservation Service Soil Survey. Citation: See MACTEC JD request package to USACE (09/2010).
- National wetlands inventory map(s). Cite name: _____
- State/Local wetland inventory map(s): _____
- FEMA/FIRM maps: _____
- 100-year Floodplain Elevation is: _____ (National Geodetic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): _____

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

or Other (Name & Date): .
 Previous determination(s). File no. and date of response letter: .
 Applicable/supporting case law: .
 Applicable/supporting scientific literature: .
 Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD:

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

WETLAND SIDE

Project/Site: East Fork Pigeon River City/County: Haywood Sampling Date: 10/5/2010
 Applicant/Owner: NC Ecosystem Enhancement Program (Applicant) State: NC Sampling Point: Flag W1-8 (L.55)
 Investigator(s): Josh Witherspoon and James Cutler Section, Township, Range: N/A
 Landform: (hillslope, terrace, etc.) Floodplain Bottomland Local Relief (concave, convex, none): concave Slope (%): <1
 Subregion (LRR or MLRA) N Lat: 35.4612 at RD point Long: -82.8444 Datum: WGS 84
 Soil Map Unit Name: Dellwood cobbly sandy loam (DeA) NWI Classification: PSS1A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			

Remarks: Invasive plant 'Multiflora Rose' is abundant in understory within wetland.
 NWI Code PSS1A = Palustrine, Scrub/Shrub, Broad-leaved Deciduous, Temporary Flooded.
 Narrow transitional boundary between upland area and wetland area.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply):			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input checked="" type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>6 inches</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: Flag W1-8 (L55)

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator	
1. <u>Salix nigra</u>	15	Y	OBL	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86%</u> (A/B)
2. <u>Platanus occidentalis</u>	15	Y	FACW	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
30 = Total Cover				Prevalence Index worksheet: OBL species <u>75</u> x 1 = <u>75</u> FACW species <u>55</u> x 2 = <u>110</u> FAC species <u>5</u> x 3 = <u>15</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>25</u> x 5 = <u>125</u> Column Totals: <u>160</u> (A) <u>325</u> (B) Prevalence Index = B/A = <u>2.0</u>
Sapling Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator	
1. <u>Salix nigra</u>	25	Y	OBL	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is > 50% <input checked="" type="checkbox"/> Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator	
1. <u>Salix nigra</u>	10	Y	OBL	
2. <u>Rosa multiflora</u>	25	Y	UPL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				Definitions of Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator	
1. <u>Aster puniceus</u>	25	Y	OBL	
2. <u>Impatiens capensis</u>	25	Y	FACW	
3. <u>Juncus effusus</u>	5		FACW	
4. <u>Boehmeria cylindrica</u>	5		FACW	
5. <u>Rubus sp.</u>	5		FAC	
6. <u>Carex sp.</u>	5		FACW	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Woody Vine Stratur (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator	
1. _____				
2. _____				
2. _____				
2. _____				
_____ = Total Cover				

Remarks: (If observed, list morphological adaptations below)

Invasive plant 'Multiflora Rose' is abundant in understory within wetland (pockets).

SOIL

Sampling Point: Flag W1-8 (L55)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 to 18	7.5 YR 3/2	90	7.5 YR 3/1	10	D	M	Loam	Mottles common and faint

¹Type C = Concentration, D = depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains

²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P,T,U)
- 5 cm Mucky Mineral (A7) (LRR P,T,U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P,T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O,S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P,S,T,U)

- Polyvalue Below Surface (S8) (LRR S,T,U)
- Thin Dark Surface (S9) (LRR S,T,U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O,P,T)
- Umbric Surface (F13) (LRR P,T,U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P,S,T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12) (LRR T,U)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:
Depth (inches)

Hydric Soil Present? Yes No

Remarks: Low chroma

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

UPLAND SIDE

Project/Site: East Fork Pigeon River City/County: Haywood Sampling Date: 10/5/2010
 Applicant/Owner: NC Ecosystem Enhancement Program (Applicant) State: NC Sampling Point: Flag W1-8 (L55)
 Investigator(s): Josh Witherspoon and James Cutler Section, Township, Range: N/A
 Landform: (hillslope, terrace, etc.) Hillslope (toe) Local Relief (concave, convex, none): concave Slope (%): <1
 Subregion (LRR or MLRA) N Lat: 35.4612 at RD point Long: -82.8444 Datum: WGS 84
 Soil Map Unit Name: Dellwood cobbly sandy loam (DeA) NWI Classification: N/A
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	within a wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply):			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Much Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____		
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No hydrologic indicators present.			

VEGETATION - Use scientific names of plants.

Sampling Point: Flag W1-8 (L55)

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	70	Y	FACU	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
70 = Total Cover				Prevalence Index worksheet: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>10</u> x 2 = <u>20</u> FAC species <u>60</u> x 3 = <u>180</u> FACU species <u>100</u> x 4 = <u>400</u> UPL species <u>10</u> x 5 = <u>50</u> Column Totals: <u>180</u> (A) <u>650</u> (B) Prevalence Index = B/A = <u>3.6</u>
Sapling Stratum (Plot size: _____)				
1. <u>Carpinus caroliniana</u>	20	Y	FAC	
2. <u>Pinus strobus</u>	20	Y	FACU	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
= Total Cover				
Shrub Stratum (Plot size: _____)				
1. <u>Rosa multiflora</u>	10	Y	UPL	
2. <u>Pinus strobus</u>	10	Y	FACU	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
20 = Total Cover				
Herb Stratum (Plot size: _____)				
1. <u>Lonicera japonica</u>	10	Y	FAC	
2. <u>Toxicodendron radicans</u>	30	Y	FAC	
3. <u>Boehmeria cylindrica</u>	10	Y	FACW	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
50 = Total Cover				
Woody Vine Stratur (Plot size: _____)				
1. _____				
2. _____				
2. _____				
2. _____				
0 = Total Cover				

Hydrophytic Vegetation Indicators:

Dominance Test is > 50%

Prevalence Index is ≤ 3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

Remarks: (If observed, list morphological adaptations below)

SOIL

Sampling Point: Flag W1-8 (L55)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix		Color (moist)	Redox Features		Loc ²	Texture	Remarks
	Color (moist)	%		%	Type ¹			
0 to 1	7.5 YR 2.5/2	100					Loam	
1 to 18	10 YR 3/3	100					Loam	

¹Type C = Concentration, D = depletion, RM = Reduced Matrix, CS = Covered or Coated Sand Grains ²Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Organic Bodies (A6) (LRR P,T,U) <input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P,T,U) <input type="checkbox"/> Muck Presence (A8) (LRR U) <input type="checkbox"/> 1 cm Muck (A9) (LRR P,T) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A) <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O,S) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) (LRR P,S,T,U)		<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S,T,U) <input type="checkbox"/> Thin Dark Surface (S9) (LRR S,T,U) <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Marl (F10) (LRR U) <input type="checkbox"/> Depleted Ochric (F11) (MLRA 151) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O,P,T) <input type="checkbox"/> Umbric Surface (F13) (LRR P,T,U) <input type="checkbox"/> Delta Ochric (F17) (MLRA 151) <input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A) <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)		Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 1 cm Muck (A9) (LRR O) <input type="checkbox"/> 2 cm Muck (A10) (LRR S) <input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P,S,T) <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 153B) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) (LRR T,U) <input type="checkbox"/> Other (Explain in Remarks)	
---	--	--	--	--	--

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: Depth (inches)	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

Remarks: No hydric soil indicators present.

APPENDIX B

NCEEP FLOODPLAIN REQUIREMENTS CHECKLIST .



EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. Edward Curtis), NC Floodplain Mapping Unit (attn. John Gerber) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	'East Fork Pigeon River Wetlands'
Name if stream or feature:	East Fork Pigeon River
County:	Haywood
Name of river basin:	French Broad River Basin
Is project urban or rural?	Rural
Name of Jurisdictional municipality/county:	Haywood County Wetlands JD through U.S. Army Corps of Engineers
DFIRM panel number for entire site:	3701200190B
Consultant name:	MACTEC Engineering & Consulting, Inc.
Phone number:	(919) 876-0416
Address:	3301 Atlantic Avenue Raleigh, NC 27604

Design Information

Provide a general description of project (one paragraph). Include project limits on a reference orthophotograph at a scale of 1" = 500". *Project Description and Figure 1 are attached to this checklist.*

Summarize stream reaches or wetland areas according to their restoration priority.

Note: Stream preservation only

Reach	Length	Priority
<i>Northwest Perennial Stream</i>	<i>664 linear feet</i>	<i>Equal priority</i>
<i>East Fork Pigeon River</i>	<i>1,411 linear feet</i>	<i>Equal priority</i>

Floodplain Information

<p>Is project located in a Special Flood Hazard Area (SFHA)?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>
<p>If project is located in a SFHA, check how it was determined:</p> <p><input type="checkbox"/> Redelineation</p> <p><input type="checkbox"/> Detailed Study</p> <p><input type="checkbox"/> Limited Detail Study</p> <p><input checked="" type="checkbox"/> Approximate Study <i>Per FEMA, the land area covered by the floodwaters of the base flood is the SFHA on NFIP maps for Haywood County.</i></p> <p><input type="checkbox"/> Don't know</p>
<p>List flood zone designation: <i>A7 (A1–A30 = 'Areas of 100-year flood; base flood elevations and flood hazard factors determined.')</i></p>
<p>Check if applies:</p> <p><input type="checkbox"/> AE Zone</p> <p style="padding-left: 20px;"><input type="radio"/> Floodway</p> <p style="padding-left: 20px;"><input type="radio"/> Non-Encroachment</p> <p style="padding-left: 20px;"><input type="radio"/> None</p> <p><input checked="" type="checkbox"/> A Zone</p> <p style="padding-left: 20px;"><input checked="" type="radio"/> Local Setbacks Required</p> <p style="padding-left: 20px;"><input type="radio"/> No Local Setbacks Required</p>
<p>If local setbacks are required, list how many feet: <i>Thirty (30) feet from stream TOB for perennial streams depicted on USGS map (Haywood County Ordinances: Chapter 151 [Watershed Protection] - Section 151.34 [Buffer Areas Required]).</i></p>

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?
Note: Not applicable to this project; i.e., stream preservation proposed, not restoration.
 Yes No

Land Acquisition (Check)
 State owned (fee simple)
 Conservation easment (Design Bid Build)
 Conservation Easement (Full Delivery Project)
Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program? *Haywood Co. (CID#370120)*
 Yes No
Note: if community is not participating, then all requirements should be addressed to NFIP (attn: Edward Curtis, (919) 715-8000 x369)

Name of Local Floodplain Administrator: *Kris Boyd (Haywood County)*
Phone Number: *(828) 452-6632*

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

- No Action
- No Rise
- Letter of Map Revision
- Conditional Letter of Map Revision
- Other Requirements

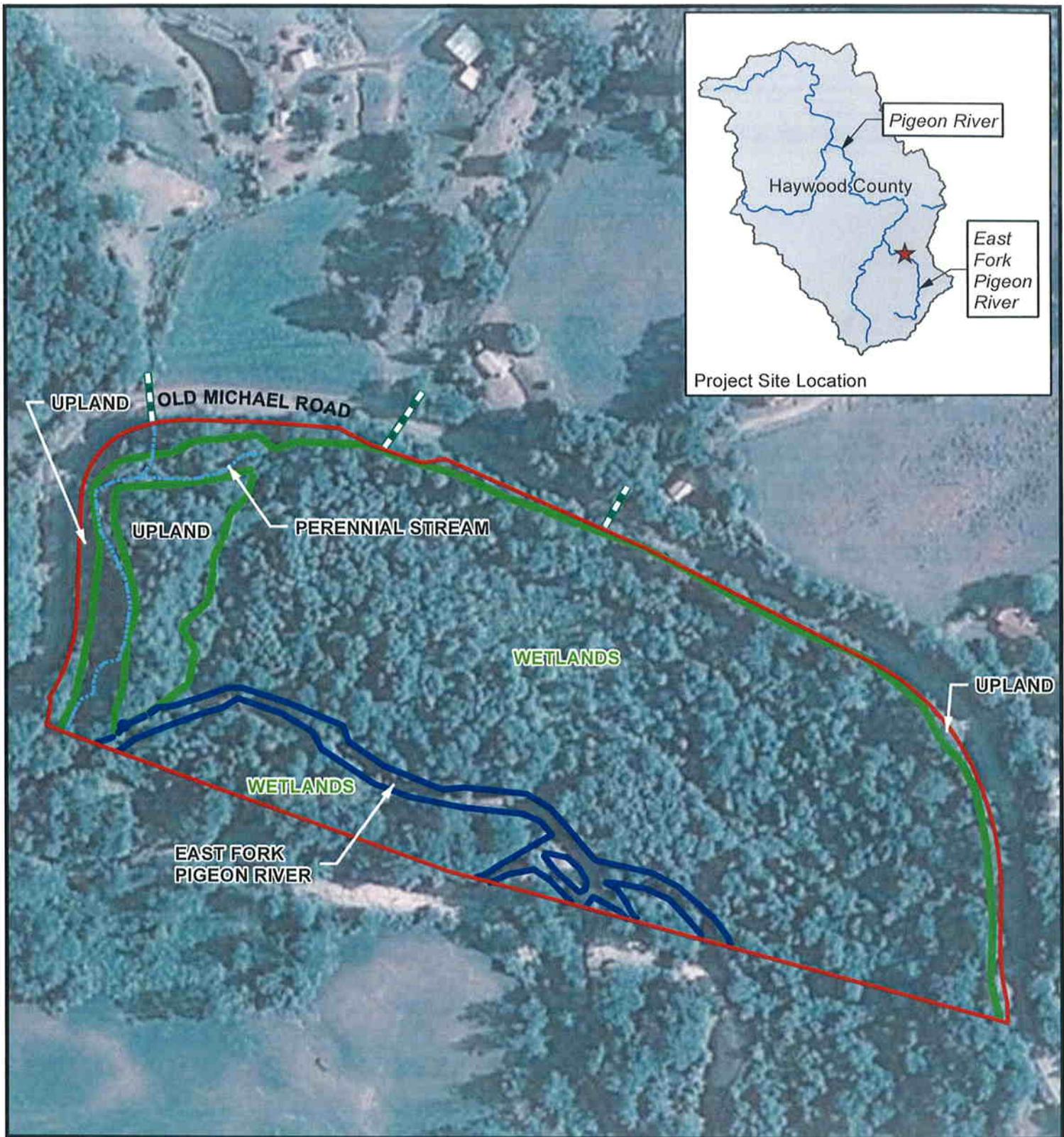
List other requirements:
No floodplain requirements are planned for this project.

Comments:
Project will not involve any development activities within the floodplain.

Name: Richard G. Harmon Signature: Richard G. Harmon
Title: Principal Scientist Date: 10 March 2011

EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
Haywood County, North Carolina
Project Description - March 2011

MACTEC Engineering and Consulting, Inc. (MACTEC) was awarded a Design Contract (SCO ID 10-07350-01) for the East Fork Pigeon River Wetlands project by the North Carolina Ecosystem Enhancement Program (NCEEP). The project site is a 15.73-acre parcel of land that is located to the south of the Town of Canton, in Haywood County, North Carolina. The project site presently consists of a bottomland hardwood forest, numerous shrub and groundstory openings, and a small upland pine island. Surface waters include a perennial stream channel and the East Fork Pigeon River. The NCEEP has obtained a conservation easement for the project site. The Wetland Mitigation Plan for the project proposes wetland enhancement of the bottomland hardwood forest which encompasses the floodplain of the East Fork Pigeon River. Nuisance plant species have become established over time within the bottomland hardwood forest (jurisdictional wetlands) on site. The Wetland Mitigation Plan presents methods for the control of six (6) nuisance plant species. The Wetland Mitigation Plan also includes a planting program to install desirable wetland plant species within the jurisdictional wetland area. The elements of the nuisance species control program and the planting plan will be approved by the NCEEP prior to implementation. The wetland enhancement will provide a quantified amount of NCEEP wetland mitigation credit for various permitted projects which occur within the French Broad River Basin Hydrologic Unit Code 06010106010010. This HUC is identified as a Targeted Local Watershed in NCEEP's 2009 French Broad River Basin Restoration Priority. The restoration goals and objectives for the East Fork Pigeon River Wetlands project include: (1) Protecting the existing project wetlands and wildlife habitat with a permanent conservation easement and (2) Enhancing the existing project wetlands and wildlife habitat by removing identified invasive plant species through manual and chemical methods and by planting native species within the project site.



Source: http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer, dated 2010.

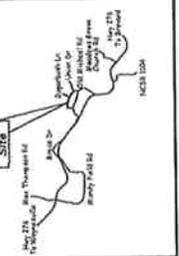
— Project Boundary - - - Perennial Stream — East Fork Pigeon River — Wetland - - - Culvert



**EEP FLOODPLAIN REQUIREMENTS CHECKLIST
EAST FORK PIGEON RIVER WETLANDS PROJECT
WETLAND MITIGATION PLAN
HAYWOOD COUNTY, NORTH CAROLINA**

PREPARED BY SJM	DATE 3/11/2010	CHECKED BY JDC	DATE 3/11/2010	JOB NUMBER 6470-10-0214	FIGURE 1
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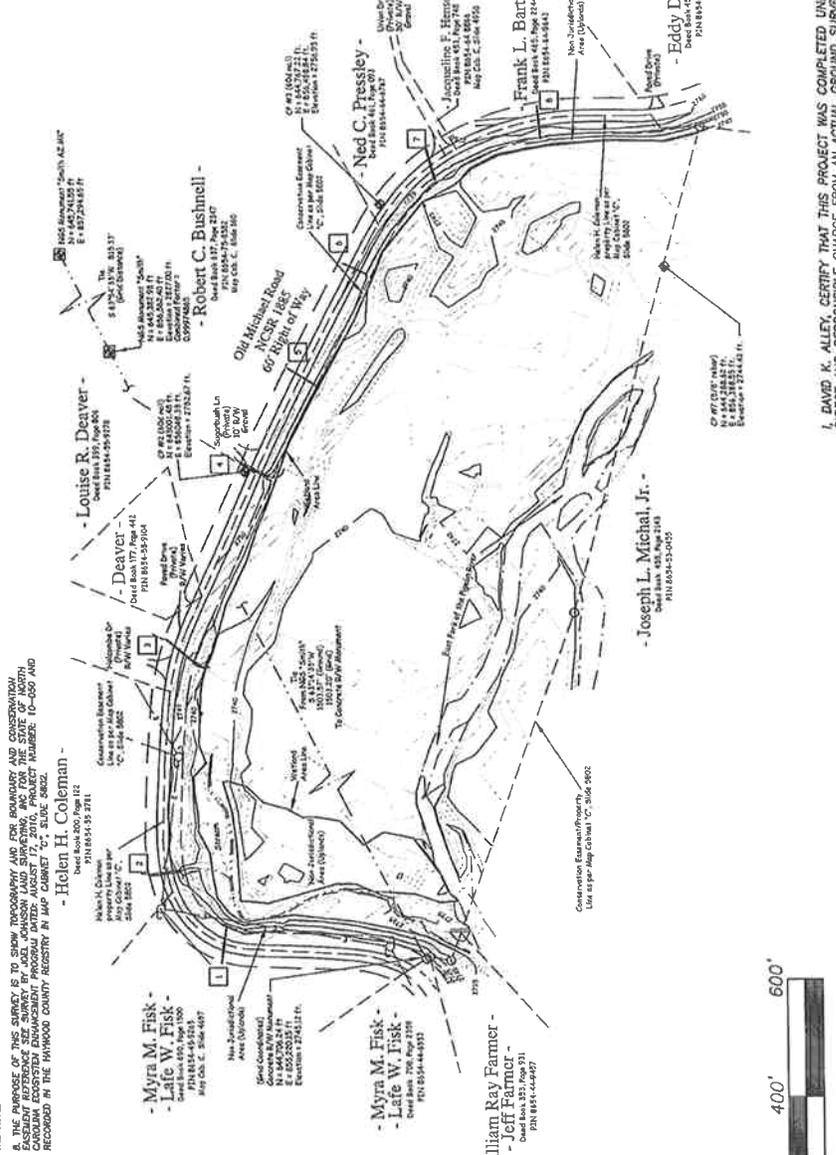
APPENDIX C
SPECIFIC PURPOSE TOPOGRAPHIC SURVEY



VICINITY MAP
(N.T.S.)

- NOTES**
1. THIS PROPERTY IS SUBJECT TO ANY EASEMENTS (WRITTEN OR UNWRITTEN).
 2. THIS PROPERTY WAS SURVEYED WITHOUT THE BENEFIT OF A TITLE SEARCH AND THEREFORE MAY NOT SHOW ALL ENCUMBRANCES.
 3. ALL CORNERS ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
 4. THIS PROPERTY IS SHOWN AS OPEN 4854-54-8075
 5. DEED REFERENCES: DEED BOOK 482, PAGE 808
 6. AREA SHOWN HEREON WAS COMPUTED BY THE COORDINATE METHOD.
 7. WETLAND AREAS SHOWN WERE FLAGGED BY JACQUES ENGINEERING AND CONSULTING, INC. ON 02/08/2010. THE WETLAND AREAS SHOWN WERE FLAGGED BY JACQUES ENGINEERING AND CONSULTING, INC. ON 02/08/2010. THE WETLAND AREAS SHOWN WERE FLAGGED BY JACQUES ENGINEERING AND CONSULTING, INC. ON 02/08/2010.
 8. THE PURPOSE OF THIS SURVEY IS TO SHOW TEMPORARY AND PERMANENT AND CONSERVATION EASEMENT REFERENCE SIZE SURVEY BY JACQUES ENGINEERING AND CONSULTING, INC. FOR THE STATE OF NORTH CAROLINA. EASEMENT REFERENCE SIZE SURVEY BY JACQUES ENGINEERING AND CONSULTING, INC. FOR THE STATE OF NORTH CAROLINA. EASEMENT REFERENCE SIZE SURVEY BY JACQUES ENGINEERING AND CONSULTING, INC. FOR THE STATE OF NORTH CAROLINA.
 9. RECORDS IN THE TOWNSHIP COUNTY REGISTRY IN LAKESIDE, N.C. SLAVE 8082.
 10. THE VERTICAL DATUM IS BASED ON NAVD 83.

- LEGEND:**
- THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.
- UNMARKED POINT
 - EXISTING IRON NAIL (EN)
 - EXISTING IRON PIPE (EP)
 - EXISTING BRONZE PIPE (EBP)
 - R.R. SPOKE FOUND
 - R.R. SPOKE SET
 - P.K. NAIL FOUND
 - P.K. NAIL SET
 - CONCRETE MANHOLE FOUND
 - CONCRETE MANHOLE SET
 - TRANSFORMER
 - SEPTIC SYSTEM (LOW PRESSURE)
 - CONTROL POINT
 - SUBJECT PROPERTY
 - WETLAND AREA LINE
 - TIE LINE
 - RIGHT OF WAY LINE
 - LINES PLATTED FROM DEEDS OR RECORDED PLATS OR AS NOTED
 - OVERHEAD POWER LINE
 - STREAM
 - RIVER
 - GEODETIC CONTROL STA. / TIE
 - CONTROL CORNER
- * ALL EXISTING AND NEW IRONS ARE FLUSH WITH THE GROUND UNLESS OTHERWISE NOTED.



STANDARD SYMBOLS

INSET # - INSET OUT - SIZE/TYPE

1. 2751.33 2794.11 18" CUP
2. 2743.10 2738.24 24" CUP
3. 2747.59 2743.66 42" CUP
4. 2751.78 2746.48 18" CUP
5. 2755.15 2750.89 30" CUP
6. 2760.41 2753.70 18" CUP



I, DAVID K. ALLEY, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THIS TOPOGRAPHIC SURVEY WAS PERFORMED TO MEET THE FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS AS APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AS INDICATED BY THE DATE; THAT THE CONTOURS SHOWN ON THESE LINES MAY NOT MEET THE STATED STANDARD; AND ALL COORDINATES ARE BASED ON NAD 83 (2007), NAVD 88.

11/27/10
DATE

N. C. PROFESSIONAL LAND SURVEYOR L-4492

NOTES

1. THIS PROPERTY IS SUBJECT TO ANY EASEMENTS (WRITTEN OR UNWRITTEN).
2. THIS PROPERTY WAS SURVEYED WITHOUT THE BENEFIT OF A TITLE SEARCH AND THEREFORE MAY NOT SHOW ALL ENCUMBRANCES.
3. ALL CORNERS ARE MARKED AS SHOWN IN THE LEGEND UNLESS OTHERWISE NOTED.
4. THIS PROPERTY IS SHOWN AS OPEN 4854-54-8075
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9. RECORDS IN THE TOWNSHIP COUNTY REGISTRY IN LAKESIDE, N.C. SLAVE 8082.
10. THE VERTICAL DATUM IS BASED ON NAVD 83.

DATE: Nov. 27, 2010
SCALE: 1" = 200'
DRAWN BY: DKA
CHECKED BY: DKA

SURVEY FOR:
State of North Carolina
Ecosystem Enhancement Program
East Fork of the Pigeon River Wetlands
NC BEP Project Number: 94203
SPO File Number: 044-P

Current Owner: Helen Hecombe Coleman
EAST FORK TOWNSHIP, HANCOCK COUNTY, NORTH CAROLINA

CAVANAUGH
Solutions through Integrity and Partnership

Charlotte, North Carolina, P.A.
520 North Trade St., Suite 500, Winston-Salem, NC 27101
336-729-0001 Fax: 336-729-1000 www.cavanaughhs.com

NCBEPS LICENSE NO. C-1773

APPENDIX D
GROUND LEVEL SITE PHOTOGRAPHY

PHOTOGRAPHIC LOG
EAST FORK PIGEON RIVER WETLANDS PROJECT
Haywood County, North Carolina



Photograph #1: View of the East Fork Pigeon River along Southern Boundary of the East Fork Pigeon River Wetlands Project Site (April 30, 2010).



Photograph #2: View of Bottomland Hardwood Forest (Wetlands) within Western Portion of the East Fork Pigeon River Wetlands Project Site (April 30, 2010).



Photograph #3: View of Open Shrub/Groundstory Area (Wetlands) within Western Portion of the East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #4: View of Bamboo Stand within Eastern Portion of the East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #5: View of Bamboo Stand along Southern Shoulder of Old Michael Road, Abutting East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #6: View of Bamboo Stand along Northern Shoulder of Old Michael Road, North of East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #7: View of Cattail Cluster in Open Area (Wetlands) within North-Central Portion of East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #8: View of Japanese Knotweed within Southeastern Portion of East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #9: View of Kudzu within Southeastern Portion of East Fork Pigeon River Wetlands Project Site (October 5, 2010).



Photograph #10: View of Kudzu along the Southern Shoulder of Old Michael Road, Northwestern Portion of East Fork Pigeon River Wetlands Project Site (April 30, 2010).



Photograph #11: View of Japanese Honeysuckle along the Eastern Shoulder of Old Michael Road, Western Portion of East Fork Pigeon River Wetlands Project Site (April 30, 2010).



Photograph #12: View of Beaver Dam within Eastern Portion of East Fork Pigeon River Wetlands Project Site (April 30, 2010).