

October 22, 2003

Memorandum

To: Regional Director, FWS, Atlanta, GA

From: Field Supervisor, FWS, Daphne, AL

Subject: Biological opinion for intra-agency consultation on the proposed Chewacla Creek Safe Harbor Agreement for the conservation of the endangered ovate clubshell mussel (*Pleurobema perovatum*) and southern clubshell mussel (*Pleurobema decisum*), and the threatened fine-lined pocketbook (*Lampsilis altilis*) in Chewacla Creek, Lee County, Alabama.

**APPLICANTS**

Landowners: Alabama Department of Conservation and Natural Resources (ADCNR):  
M. Barnett Lawley, Acting Commissioner, 334/242-3486, 64 North Union  
Street, Room 474, Montgomery, Alabama, 36130

Bob and Fannie Harris, LLC (Harris): Dr. Charles Harris, 301/460-0285,  
13908 Turnmore Road, Silver Spring, Maryland, 20906

John W. Pace III (Pace): Betty M. Pace, 251/344-8408, 615 Skyline  
Drive, Mobile, Alabama, 36609

Phillips Family Partnership, Ltd. (Phillips): Elaine P. Espy, 334/502-0310,  
1458 South Donahue Drive, Auburn, Alabama, 36832

Water Works Board of the City of Auburn, Alabama (Water Board): Rex  
B. Griffin, Jr., Manager, 334/887-4911 ext. 224, 114 No. Donahue Drive,  
Auburn, Alabama, 36830

Martin Marietta Materials, Inc. (Martin Marietta): David Barkley, Martin  
Marietta Aggregates, Shorter Sand and Gravel Plant, 334/727-6662, P.O.  
Box 339, Shorter, Alabama, 36075

Cooperator: The City of Auburn, Alabama (City): Doug Watson, City Manager,  
334/501-7260, 144 Tichenor Avenue, Auburn, Alabama, 36830

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) based on our review of the proposed Enhancement of Survival Permits (ESP) to be issued by the Service to the applicants, listed above, for the implementation of conservation measures in Chewacla Creek, Auburn, Alabama, for the benefit of the endangered ovate clubshell mussel (*Pleurobema perovatum*) and southern clubshell mussel (*Pleurobema decisum*), and the threatened fine-lined pocketbook (*Lampsilis altilis*), following section 7 of the Endangered Species Act of 1973 (Act), as amended, (16 U.S.C. 1531 *et seq.*). The Service's approval of an ESP is a federal action subject to consultation under section 7(a)(2) of the Act.

This BO is based on information in the applications for ESP, the accompanying Safe Harbor Agreement (SHA), the Environmental Assessment (EA), and other sources of information. Additional information used in this opinion was derived from telephone conversations and/or meetings with representatives of the Service (Paul Hartfield, Larry Goldman, Lee Andrews, and Richard Gooch), ADCNR (Jon Hornsby and Will Gunter), the SHA applicants and their agents, and other sources of information. A complete administrative record of this consultation is on file at the Service's Daphne Alabama Ecological Services Field Office.

## **CONSULTATION HISTORY**

May 1, 2001: An initial meeting was held between the Service and the applicants to discuss conservation actions the applicants were proposing to take in order to restore flow to portions of Chewacla Creek and improve the habitat for three Federally protected mussels previously located there. We also discussed the different protections from incidental take available through section ten of the Act.

September 6, 2001: A meeting was held between the Service and the applicants to discuss the initial draft of the SHA.

February 21, 2002: A meeting was held between the Service and the applicants to discuss several aspects of the proposed draft SHA, including proposed minimum flow releases from the dam.

March 28, 2002: A meeting was held between the Service and the applicants to discuss the specific details of the proposed SHA, answer questions and receive input from each of the applicants concerning the ESP permit process, and discuss several outstanding issues with the SHA.

December 13, 2002: The Applicants provided a final draft of the SHA to the Service along with the applications and fees for the ESP.

April 10, 2003: The Service published a Notice of Availability regarding the proposed Chewacla Creek SHA in the Federal Register (68:11405-11406). At that time the Service entered into formal intra-Service consultation.

June 17, 2003: A draft BO was provided to the Service's Southeast Regional Office (RO) for review and comment.

June 19, 2003: The RO responded with comments.

August 7, 2003: The applicants provided their final signed version of the SHA, which included a revision to the baseline mussel population numbers, to the Service.

August 18, 2003: The entire permit package was transmitted from the Daphne ES office to the RO.

October 22, 2003: BO and EA revised per request of the Regional Solicitor's Office and resubmitted to RO.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF PROPOSED ACTION**

Chewacla Creek's headwaters originate south of Opelika, Alabama. The creek flows through pasture, commercial, and private developments before emptying into Lake Ogletree, which is the primary drinking water source for the residents of Auburn, Alabama. The SHA properties are located in Lee County, Alabama, within Township 18 North, Range 25 East, Sections 13 & 24; and Township 18 North, Range 26 East, Sections 16, 17, & 18. The properties included in the SHA lie within the Piedmont ecoregion, a transitional area between the Appalachian Mountains to the northeast and the relatively flat coastal plain to the south and southeast (Webber and Blevins, 2000).

The upstream end of the SHA properties is Lake Ogletree and the surrounding adjacent land owned by the Water Board. As it flows downstream from the lake through the SHA properties, Chewacla Creek flows over several geologic formations including the Manchester Schist, the Chewacla Marble, and the Hollis Quartzite (Buss, 2001).

Chewacla Creek, downstream of the base of Lake Ogletree dam, currently loses water into subsidence features located within, and adjacent to, the creek (Buss, 2001). Buss (2001) identified a total of 109 subsidence features located in the immediate vicinity of the Martin Marietta Materials' limestone quarry (Quarry). The term "subsidence features" includes the following four different types of features (Buss, 2001): (1) Closed depressions, where the soil is intact and ground surface has no apparent collapse, but surface water is internally drained, (2) Sinkholes, where soil or bedrock is collapsed in a circular-like shape, (3) Solutioned fractures, which are similar to sinkholes but linear in dimension, and (4) Swallow holes, which are funnel shaped and receive surface water runoff. These subsidence features act to funnel water into the ground causing a portion of Chewacla Creek to become dry during most of the year. The area of Chewacla Creek that is directly affected by the subsidence features is about 51,600 feet in length and about 20 feet wide, totaling 1.18 acres. The lack of constant stream flow in this section of the creek has made it unsuitable as habitat for the three listed mussels that previously occurred in the area. It has also physically and genetically isolated a population of fine-lined pocketbook mussel, which occurs upstream of this section, from downstream populations within Chewacla Creek.

The proposed conservation measures, repair of subsidence features located within and immediately adjacent to the creek and restoration of a consistent stream flow, would increase the quantity and quality of available habitat for the species covered by the SHA. Without the proposed SHA and ESP, the applicants would have to obtain a permit under the Act prior to

taking any action that would result in incidental take of listed species. The participation in the SHA and ESP eliminates a need for the applicants to comply with section 9 take regulations of the Act when they propose new actions in this creek.

### *Overview of Conservation Measures*

Conservation measures that will provide a net conservation benefit to the covered species will be implemented on each SHA property by the applicants. These measures will be coordinated to increase the quality and quantity of available habitat for the three mussel species. Martin Marietta, as authorized by the other applicants, will repair subsidence features in Chewacla Creek, and within ten feet of its banks, within the SHA properties. Water will be pumped from the Quarry pits operated by Martin Marietta and conveyed by a pipeline to discharge into Lake Ogletree. With the availability of this additional water, the Water Board will provide a two million gallon per day (MGD) minimum flow in Chewacla Creek at the base of Lake Ogletree Dam. Martin Marietta will monitor for, and repair if necessary, any new subsidence features which form within the SHA properties so that the minimum flow is not diminished downstream. Adaptive management by Martin Marietta and the Water Board, in the form of periodic monitoring and bioassessment, will be part of the implementation of these measures. The specific conservation measures that are authorized and will be implemented for each SHA property are described below.

### *Subsidence Feature Control*

Martin Marietta will monitor for and repair subsidence features, either new or existing, located in or within ten feet of Chewacla Creek within the SHA properties, to maintain a minimum continuous stream flow adjacent to the Quarry equal to two MGD as measured at gauging station four. Locations of all gauging stations are depicted on the map (Attachment 1). In addition, Martin Marietta will repair subsidence features in the portions of Chewacla Creek adjacent to the Quarry if, in the opinion of the Geological Survey of Alabama (GSA), there is a decrease in stream flow between gauging station two and gauging station four. These obligations will be carried out by Martin Marietta as long as they are operating the Quarry. Should the flow in Chewacla Creek at gauging station two be less than two MGD, then Martin Marietta is only required to repair subsidence features to the extent necessary to maintain a quantity of flow at gauging station four equal to that measured at gauging station two. It is anticipated that the Water Board will seek the water rights from each Landowner, respectively, associated with the Quarry after reserves are no longer extracted from the Quarry. Assuming the Water Board obtains water rights, it will assume Martin Marietta's repair obligation described above. Subsidence feature repair work under this paragraph will be performed as soon as reasonably practicable in the judgment of the party performing the work based on weather and stream flow conditions and subject to any applicable laws and regulations.

### *Supply of Quarry Water to Lake Ogletree*

Martin Marietta currently holds permits to discharge water from the Quarry pits into Chewacla Creek at two outfalls. The locations of these outfalls are depicted on the map (Attachment 1). Outfall one is from the new (West) pit. The outfall one discharge point into Chewacla Creek is on the Pace property and the West pit is located on the Phillips property. Outfall two is from the old (East) pit. Outfall two's discharge is located on the Harris property, while the East pit is located on the Harris and Pace properties.

Martin Marietta has received approval from the Alabama Department of Environmental Management (ADEM) for a new discharge point into Lake Ogletree. This discharge will use an

existing underground 16 inch ductile iron pipeline on easements from Lake Ogletree to a point on the Harris property on the bank of Chewacla Creek. A new underground pipeline will be constructed from this point to connect with outfall two. The discharge of the Quarry water into Lake Ogletree, as opposed to directly into Chewacla Creek as it is presently, will allow the removal of sediment and a moderation of pH levels. ADEM has requested an emergency discharge capability at the base of the dam (to be controlled by the Water Board). Martin Marietta will pump the pit water from the old pit to existing outfall two as required for mining operations. Martin Marietta will continue to discharge from outfall one to Chewacla Creek, and it reserves the right to continue to discharge from outfall two in periods of high flow, to reduce overall pumping cost to Lake Ogletree. Pumping records will be kept by Martin Marietta and the Water Board and filed monthly. The Water Board will maintain the pumping records as a public record.

The new discharge point into Lake Ogletree will need the installation of a booster pump and construction of approximately 1,400 feet of pipeline from outfall two to the existing underground pipeline, described above. The Water Board will purchase, install, operate, and maintain this equipment following manufacturer's recommendations. Martin Marietta will be responsible for the cost of the electric power necessary to pump the amount of water needed to provide the minimum flow, until this obligation is transferred to the Water Board.

#### *Minimum Flow from Lake Ogletree*

The Water Board will guarantee a minimum flow of two MGD at the base of Lake Ogletree dam for as long as the Quarry is in operation and thereafter, provided the Water Board obtains the water rights as anticipated. Historically, the old pit has produced from five to nine MGD and the new pit has produced about 0.23 MGD (Martin Marietta, 2000). If old pit fails to produce at least 3.5 MGD, the Water Board's minimum flow obligation will be reduced in direct proportion. For example, if only 0.7 MGD is available from the old pit, then the Water Board's minimum flow obligation will be reduced to 0.4 MGD. The GSA has estimated that 0.4 MGD is the natural "7Q10" for Chewacla Creek downstream of Lake Ogletree (GSA, 2002). Pumping records maintained by Martin Marietta for 2000, a severe drought year, indicate that the least amount of water produced daily by the old pit was 2.25 MGD, which would be a minimum flow at Lake Ogletree Dam of 1.28 MGD.

In addition, the two MGD minimum flow will be subject to staged reduction under the following water shortage circumstances. In the event the City imposes mandatory water use restrictions on its customers, the minimum flow will be reduced over a three-day period to 0.4 MGD. If the City has imposed mandatory water use restrictions and the Water Board determines, in consultation with the City, that it will not be able to meet the restricted demand for water, the minimum flow obligation will be waived. In such a situation, the Water Board will try to provide flows to Chewacla Creek that do not interfere with its obligation to meet the demand for environmental support and city water. Historically, the City has never imposed mandatory water use restrictions. Thus, the staged flow provided for in the SHA is expected to result in increased flows within the SHA properties except in unforeseen circumstances. The Water Board will notify the Service in advance of any anticipated flow reductions under sections 4.2 and 4.6 of the SHA. Additionally, the Water Board will coordinate such reductions with Service and implement recommendations that still allow meeting customer water needs.

The method of siphoning or pumping water from Lake Ogletree to the Creek will be determined by the Water Board under applicable rules and regulations. Water will be pumped or siphoned from a depth sufficient that assures adequate dissolved oxygen downstream, as shown by the annual bioassessment.

### *Monitoring and Bioassessment*

The Water Board and Martin Marietta commit to the continuous monitoring of stream flow at six points: (1) downstream of Lake Ogletree dam, (2) just upstream of the Pretty Hole, (3) approximately 1500 feet downstream of Pretty Hole, (4) approximately 1500 feet downstream of outfall two, (5) at the Wright's Mill Road bridge, and (6) just downstream of the confluence with Town Creek. The locations of these gauging stations are depicted in Attachment 1. The cost of the stream gauging equipment will be the joint and equal obligation of Martin Marietta (or any subsequent operator of the Quarry) and the Water Board, for as long as the Quarry is in operation, and thereafter the sole obligation of the Water Board. This stream gauging obligation will continue for the Water Board so long as either Lake Ogletree or the Quarry is serving as a water source for the City of Auburn.

In addition, the Water Board agrees to conduct an annual bioassessment of Chewacla Creek at sites (1), (2), (3), (4), and (6). The bioassessment will include an assessment of macroinvertebrate, mussel, and fish communities, with water chemistry analysis and a visual physical habitat assessment for a period of 15 years. At the end of the 15 year bioassessment period, this requirement will stop if the Service reasonably determines that the conservation measures have been properly implemented. This monitoring and bioassessment obligation will continue for Martin Marietta so long as it is extracting reserves from the Quarry pit and for the Water Board so long as either Lake Ogletree or the Quarry is serving as a water source for the City of Auburn.

### **Action Area**

The action area for this BO includes all of Chewacla Creek because implementation of the conservation measures should result in a more natural flow in all sections of the creek. However emphasis is placed on the areas within the SHA properties because of the lack of consistent flows which currently exist upstream of Martin Marietta's outfall two. Downstream from outfall two there will not be an increase in the amount of flow in Chewacla Creek, only a moderation of flow consistency. In addition to Chewacla Creek, the land area where the new waterline and pump will be installed, needed to transport water from the quarry to Lake Ogletree, is also included in the action area. A map of the area is included as Attachment 1. The SHA properties are highlighted and labeled with the property owners name on the map.

The Water Board owns Lake Ogletree and the land surrounding it, including several hundred yards of Chewacla Creek downstream of the dam, and a small parcel of land on the south side of the creek downstream of Martin Marietta's outfall number one. Further downstream, on the northern side of the Creek, the ADCNR owns and operates Chewacla State Park. Opposite the State Park on the south side of the creek are three private land owners, from east to west, Harris, Pace, and Phillips. Martin Marietta leases land from these three landowners. Between the Water Board upstream property and the ADCNR/Harris property, Chewacla Creek flows adjacent to multiple properties, the landowners of which are not parties to the SHA. The property within and adjacent to Chewacla Creek downstream from the ADCNR/Phillips property is also owned by multiple property owners and is not included in the SHA.

### **STATUS OF THE SPECIES/CRITICAL HABITAT**

## **Species/critical habitat description**

Three species of unionid mussels in Chewacla Creek receive Federal protection under the Act. The southern clubshell mussel and ovate clubshell mussel were listed as endangered, and the fine-lined pocketbook was listed as threatened on March 17, 1993 (Service, 1993). These mussel species are endemic to portions of the Mobile River Basin, which is composed of seven major river systems (Mobile, Tombigbee, Black Warrior, Alabama, Cahaba, Coosa, and Tallapoosa) and drains portions of Alabama, Georgia, Mississippi, and Tennessee.

Critical habitat has been proposed for eight endangered and three threatened mussels in the Mobile River Basin, including the ovate clubshell, southern clubshell, and fine-lined pocketbook (Service, 2003). Unit 17 of the critical habitat proposal includes a portion of Chewacla Creek extending from its confluence with Opintlocco Creek upstream to Lee County Road 159. A portion of the Phillips and ADCNR properties lie within the proposed critical habitat area.

## **Life History**

Very little reproductive information exists for these three mussels. The fine-lined pocketbook is usually found in substrates composed of sand and silt mixed with gravel. The ovate and southern clubshell are found in sand and fine gravel substrates. These species prefer streams with a moderate current and water depths of three feet or less (Parmalee and Bogen, 1998).

## **Population dynamics**

In laboratory experiments, Haag *et al.* (1997) showed that redeye (*Micopterus coosae*), spotted (*M. punctulatus*) and largemouth bass (*M. salmonoides*) may serve as fish hosts for fine-lined pocketbook glochidia. The host fish for the southern clubshell have been identified as the blacktail (*Cyprinella venusta*), Alabama (*C. callistia*), and tricolor shiner (*C. trichroistia*) (Haag and Warren, 2001; as cited in Service, 2003). The host fish for ovate clubshell glochidia is unknown (Parmalee and Bogen, 1998). Gravid fine-lined pocketbook females have been observed March through June (Service, 2003). Both the ovate and southern clubshell gravid females have been observed in June and July (Service, 2003).

## **Status and distribution**

The fine-lined pocketbook was historically reported from the Tombigbee, Black Warrior, Cahaba, Alabama, Tallapoosa, and Coosa Rivers and many of their tributaries. The presence of this species has been confirmed in the Cahaba and Little Cahaba Rivers, Coosa River, Terrapin Creek and South Fork Terrapin Creek, Big Canoe Creek, Cheaha Creek, Yellowleaf Creek and its tributary Muddy Prong, Kelly Creek and its tributary Shoal Creek, Tallasahatchee Creek, and the Tallapoosa River and its tributaries Uphapee, Choctafaula, Chewacla, Opintlocco, Cane, Little Cane, and Muscadine Creeks. This species' range has become severely restricted in recent years with small localized populations within these streams (Hartfield, 2000).

The ovate clubshell historically occurred in the Tombigbee, Black Warrior, Alabama, Cahaba, and Coosa Rivers and tributaries, and Chewacla, Uphapee and Opintlocco Creeks in the Tallapoosa River drainage, in Alabama. Currently, the species is known to survive in the Buttahatchee River, Luxapalila Creek and its tributary Yellow Creek, Sipsey River, Sucarnoochee River, Coalfire Creek, Chewacla Creek, and Coosa River downstream of Weiss

Dam (Hartfield, 2000). Populations of the ovate clubshell are small and localized.

The southern clubshell was formerly known from every major stream system in the Mobile River Basin, including Chewacla Creek. Currently, the species is limited to the East Fork of the Tombigbee River, Bull Mountain Creek, Buttahatchee River, Luxapalila Creek, Sipse River, Alabama River, Bogue Chitto Creek, Chewacla Creek, Coosa River downstream of Weiss Dam, Kelly Creek, Big Canoe Creek, and Terrapin Creek. The southern clubshell is relatively common in localized reaches of the Buttahatchee and Sipse Rivers, but is rare to uncommon in other occupied streams (Hartfield, 2000).

### **Analysis of the species/critical habitat likely to be affected**

The proposed action should provide beneficial effects to the mussels and their habitat. However, withdrawal of any participants would make computation of the benefits of the SHA difficult because it would not be a complete project. Potential effects include returning the habitat to baseline conditions, consisting of sinkholes within the streambed and little or no flow for portions of the year within the section of Chewacla Creek downstream of the Lake Ogletree Dam and upstream of its confluence with Moore's Mill Creek. These habitat alterations would affect any mussel populations which were to re-colonize these habitats. No adverse affects to the baseline population, described below, of the three mussel species within the proposed action area is expected. Adverse effects and incidental take of the baseline populations of the three mussels is not covered in this BO.

Critical habitat for the three listed mussels has been proposed, but not finalized, therefore the proposed action would not result in adverse modification of critical habitat. Once the critical habitat determination is finalized, a portion of the SHA properties downstream of Chewacla Creek's confluence with Moore's Mill Creek, may be within designated critical habitat; however, the implementation of conservation measures included in the proposed action should not result in adverse modification of this area.

## **ENVIRONMENTAL BASELINE**

### **Status of the species within the action area**

Baseline conditions for the SHA, and associated ESP, are described with reference to each SHA property. Included in each property, for the purposes of the baseline descriptions in this section, is the bed and banks of Chewacla Creek adjacent to that property. The baseline is described in terms of locations and numbers of covered species. The aquatic habitat within the SHA properties is described in Webber and Blevins (2000) and Richardson (2001).

The following is the baseline description for each property in terms of locations and numbers of the covered species:

#### *Water Board property*

Garner (2002) conducted a survey for freshwater mussels at the Water Board property downstream from Lake Ogletree Dam. Garner located and identified ten live fine-lined pocketbook individuals, but located no southern clubshell or ovate clubshell individuals. However, based on the description of where these mussels were located it was unclear whether

they were actually on Water Board property or on adjacent property, outside of the creek area covered by the SHA. Gangloff and Feminella (2003) conducted a new survey of the Water Board property to correctly determine the baseline population for this property. They found one live fine-lined pocketbook and no ovate or southern clubshell mussels within the Water Board property. Gangloff and Feminella (2003) describe the habitat within the Water Board property as “suboptimal”, except for the last 50 meters of stream reach closest to their downstream property boundary, due to a lack of sufficient flow for mussel reproduction. Thus, the baseline for the Water Board property downstream from Lake Ogletree Dam is one for the fine-lined pocketbook and zero for the southern clubshell and ovate clubshell.

Between the Water Board upstream property and the Harris property, Chewacla Creek flows adjacent to multiple properties, the landowners of which are not parties to the SHA. Populations of fine-lined pocketbook in Chewacla Creek in this area are described in Gangloff (2001).

The downstream parcel of the Water Board property is adjacent to Chewacla Creek near the Wright’s Mill Road bridge. Gangloff (2001) reported none of the covered species or any other member of the Unionidae family at the Wrights Mill Road bridge. Richardson (2001) also reported none of the covered species at a site just upstream of the Wrights Mill Road bridge. Thus, the baseline for all three mussel species for this downstream parcel of the Water Board property is zero.

#### *Harris property*

Garner (2002) conducted a survey for freshwater mussels at the Harris property, but located no live specimens of any of the covered species. Sampling performed by Richardson (2001) in Chewacla Creek adjacent to the Harris property also revealed none of the covered species. Moreover, as noted by Garner (2002), much of Chewacla Creek adjacent to the Harris property (from Pretty Hole downstream to outfall 2) is of an ephemeral nature and currently can not maintain a baseline population for any of the covered species. Thus, the baseline for the Harris property is zero for all three mussel species.

#### *Pace property*

Recent sampling performed in Chewacla Creek adjacent to the Pace property revealed none of the covered species. Gangloff (2001) reported none of the covered species or any other member of the Unionidae family at the Wrights Mill Road bridge (near the western boundary of the enrolled property). Richardson (2001) sampled for mussels in Chewacla Creek adjacent to the Pace property near its eastern boundary and just upstream of the Moore’s Mill Creek confluence and reported none of the covered species. Weber and Blevins (2000) conducted sampling for invertebrates, including mussels, over a 300 foot stretch of Chewacla Creek adjacent to the Pace property and counted none of the covered species. Thus, the baseline for the three mussels for this property is zero.

#### *Phillips property*

Sampling in Chewacla Creek adjacent to the Phillips property also revealed none of the covered species. Gangloff (2001) reported none of the covered species or any other member of the Unionidae family at the Wrights Mill Road bridge (near the eastern boundary of enrolled property). Richardson (2001) sampled for mussels in Chewacla Creek adjacent to the Phillips property near its eastern boundary and reported none of the covered species. Weber and Blevins (2000) conducted sampling for invertebrates, including mussels, over a 300 foot stretch of Chewacla Creek adjacent to the Phillips property and counted none of the covered species. Thus,

the baseline for the mussel species for this property is zero.

#### *ADCNR property*

The ADCNR property is located on the north side of Chewacla Creek directly across from the Harris, Pace, downstream Water Board, and Phillips properties. Thus, the baseline for the ADCNR property is zero for all three mussel species, the same as the baseline for the Harris, Pace, downstream Water Board, and Phillips properties as described above. Chewacla Creek runs for about 252,300 feet and averages about 25 feet wide through these properties, totaling 5.79 acres.

#### *Action area downstream from the Phillips/ADCNR properties*

Chewacla Creek downstream of the Phillips and ADCNR properties is a free flowing creek bordered by mostly private land owners. Although slight fluctuations in flow occur due to releases from the Martin Marietta quarry, the creek flows continuously at a depth sufficient to support the listed mussels and their host fish. Webber (2002) conducted stream quality assessments at seven locations downstream from the enrolled properties. He found that water chemistry reflected inputs of nutrients and sediment from both point and non-point sources. Webber (2002) also concluded that the macroinvertebrate community was slightly to moderately impaired, in part due to deposition of fine sediments in the stream bed.

No comprehensive mussel survey has been done for the entire length of Chewacla Creek; therefore, no quantitative measure of the mussel baseline for this area is available. In 2000, Gangloff (2001) conducted mussel surveys at two sites in Chewacla Creek downstream from the enrolled properties. He found all three listed mussels in the creek at Macon County Road 22 and two of the three at Macon County Road 71. Hartfield (2000) states that Chewacla Creek supports small localized populations of the fine-lined pocketbook, southern clubshell, and ovate clubshell downstream from Lee County Road 33. Pierson (1991) found an abundance of southern clubshell downstream from Macon County Road 22 in 1991, but nine years later was unable to confirm the existence of the species at the same location (Pierson, personal communication). Shelton (1994) reported finding fine-lined pocketbook and southern clubshell mussels in a pool immediately downstream from Macon County Road 22.

#### **Factors affecting the species environment within the action area**

These riverine mussels are intolerant of impoundments and are generally limited to high quality, stable gravel or gravel and sand substrates in flowing water (Hartfield and Jones, 1989; and Pierson, 1991). Impoundments adversely affect riverine mussels by: killing them during construction; suffocation by accumulation of sediments; lower food and oxygen availability by the reduction of water flow; and local extirpation of the fish host. Lake Ogletree dam was constructed on Chewacla Creek in the 1940s to provide a reliable drinking water source for the City of Auburn. The initial spillway elevation was 481.5 feet above mean sea level (msl); however, since 1991 the elevation has been raised to 486 feet msl. Lake Ogletree has not discharged a continuous flow into Chewacla Creek since its construction (Buss 2001). Increased water usage by the residents of Auburn, compounded by drought conditions during recent years, has restricted the amount of water flowing into Chewacla Creek downstream of the dam. This has resulted in habitat degradation to Chewacla Creek, as described above, within the action area.

Martin Marietta Materials took over operation of a limestone quarry on the Harris, Pace, and Phillips enrolled properties in 1995; however, the quarry has been in constant operation since the early 1970s and construction aggregate has been produced at this site, off and on, since the 1920s (Buss 2001). The quarry at this location has impacted the water quality of Chewacla Creek mainly through sedimentation from permitted effluent outfalls. These water quality impacts are considered minimal, and effects are absent a short distance downstream. Historic quarry operations coupled with the geology of the area may be factors in the development of sinkholes within Chewacla Creek and the surrounding enrolled properties (Richardson 2001). These subsidence features in, and adjacent, to the stream bed allow creek water to flow into the ground. This has resulted in a section of the creek to become seasonally dewatered. This dewatered portion directly eliminates habitat from being available to the mussels. It also restricts host fish from being able to transport the mussel glochidia to other portions of the creek.

Sedimentation may cause direct mortality by deposition and suffocation (Ellis, 1936) and eliminate or reduce recruitment of juvenile mussels (Negus, 1966). Suspended sediments can also interfere with feeding (Dennis, 1984). Due to a lack of consistent stream flow between the dam and dewatered section, excess sedimentation accumulates between storm flushing events reducing habitat quality. Moore's Mill and Town Creeks both enter Chewacla Creek within the State Park enrolled property. Both creeks originate in the immediate Auburn area, a rapidly developing urban area. Sedimentation and non-point source pollutants from residential and commercial development impacts the water quality in these creeks, as well as Chewacla Creek (Webber and Blevins 2000, Jones 2001). This excess sedimentation also reduces habitat quality within the action area. Moore's Mill Creek is listed on ADEM's 303(d) list of impaired streams for excess sedimentation (ADEM 2002). Turbidity has been observed to be present in Chewacla Creek several miles downstream of the enrolled properties (Richardson 2001).

Other types of water quality degradation from both point and non-point sources affect these mussel species within the action area. Point sources of water quality degradation include runoff from agricultural fields, pastures, wastewater effluents, active and abandoned mine sites, and highway and road drainage (Service, 1993). Martin Marietta currently has two NPDES discharge points in Chewacla Creek within the action area. Stream discharge from these point and non-point sources result in decreased oxygen concentration, increased acidity and conductivity, and other changes in water chemistry which may impact mussels and/or their host fishes.

Exotic mussel species are also a problem in this area. The Asiatic clam (*Corbicula fluminea*), which is locally abundant in Chewacla Creek within the action area, reproduces rapidly, does not need a fish host for reproduction, and can reach high densities that out compete native mussels for food and physical space (Dillon, 2000).

There are several platted subdivisions along the north side of Chewacla Creek between the dam and Chewacla State Park and two individual parcels on the south side between the lake and the Harris enrolled property. The subdivision lots which border the creek are either single family homes or are vacant. The parcels on the south side of the creek were historically used for forestry or agriculture. These parcels are currently vacant and their future development potential is unknown. Minor recreational and residential impacts to the creek are associated with the parcels and subdivision lots (Richardson 2001). There may also be minimal recreational effects along the creek on the Chewacla State Park property.

## **EFFECTS OF THE ACTION**

## **Factors to be considered**

All activities authorized by the Service under section 10(a)(1)(A) must meet permit issuance criteria at 50 CFR §§ 17.22, .32. Or .52. All activities considered in this BO must be justified in relation to enhancement of survival and recovery, effects to the wildlife species, peer review, and qualifications of permittees. By definition then, authorized activities should benefit recovery with minimal adverse effect by qualified permittees.

## **Analyses for effects of the action**

### *Beneficial effects*

The subsidence features in and immediately adjacent to the Chewacla Creek act to funnel water into the ground causing a portion of the creek to become dry during most of the year. The lack of constant stream flow in this section of Chewacla Creek, downstream of the Pretty Hole to Martin Marietta's outfall 2, has made that section of the creek habitat unsuitable to the ovate clubshell, southern clubshell and fine-lined pocketbook. It has also physically and genetically isolated the population of fine-lined pocketbook mussel which occurs upstream of this section.

Implementation of the proposed conservation measures, repair of subsidence features located within and immediately adjacent to the creek and restoration of a consistent stream flow, would increase the quantity and quality of available habitat for the covered species. The repair of subsidence features within the creek should prevent flow from draining out of the creek channel, allowing the flow to continue to downstream portions of the creek. Pumping water from the quarry into Lake Ogletree will allow for excess nutrients and sediment in the Quarry water to settle out in the lake, moderating the pH of the water which will be released into the creek. Pumping water into Lake Ogletree will also allow for a guaranteed minimum flow release from the lake, which will result in flows mimicking more natural flows in Chewacla Creek. The increased flow and repaired creek bed should result in a more natural creek channel and should allow the mussels and host fish to locate within the action area. A total of 5.97 acres of mussel habitat is covered by the SHA action area, all of which will be improved through the implementation of the SHA conservation measures.

Once the subsidence features have been repaired and a minimum guaranteed stream flow restored, beneficial effects should take place relatively quickly. The increased flow will improve habitat quality for the upstream population of the fine-lined pocketbook immediately. Fish host species will be able to move into the previously dry creek section shortly after flow is restored. Once the habitat is restored and the host fish are able to use it, reestablishment of the mussel population could follow in a short period of time. Quantifying the timing and degree of the beneficial effects would be difficult, if not impossible, due to the numerous factors which will figure into the recolonization of this area by the mussels, once conservation measures have been implemented and stream flow restored to the creek.

Chewacla Creek downstream of the action area will indirectly benefit from the improved upstream water quality and increased more natural flows. These increased flows will also aid in transporting excess sedimentation, coming into Chewacla Creek from several creeks flowing out of Auburn area, further downstream.

### *Direct effects*

All of the direct effects of the proposed action are beneficial effects which are described above.

### *Indirect effects*

Indirect effects are the effects caused by the proposed action which occur at a different location or later in time than the proposed action. The indirect effects associated with the proposed action are beneficial effects and are described above.

### **Species' response to the proposed action**

Only one individual of the covered mussel species currently exists within the action area. A single fine-lined pocketbook mussel was found on the upstream Water Board property (Gangloff and Feminella, 2003). The majority of the habitat in this area of the creek is less than optimal, with slow moving stagnant water containing large algal mats and excessive fine sediments (Webber and Blevins, 2000). The occupied habitat, totaling only 0.03 acre, is the only suitable mussel habitat in this section of the upstream Water Board property (Gangloff and Feminella, 2003). A larger population of fine-lined pocketbook mussel was found immediately downstream of the Water Board property (Garner, 2002; Gangloff 2001), but not within the action area of the SHA. This population of fine-lined pocketbook located in this section of the creek should benefit from the increased flow, which will aid in transporting the fine sediments downstream and prevent algal mats from forming, and open up new habitat for expansion of the existing population.

No southern clubshell or ovate clubshell mussels have been found within the immediate project area, including the dewatered section and the creek upstream from this area; however, we believe that once flow is returned to the dry section of Chewacla Creek, the mussels will be able to naturally re-colonize this area. Populations of all three mussels have been identified in Chewacla Creek downstream of the SHA enrolled properties, with the closest confirmed location about 5 miles downstream near Macon County Road 22 (Hartfield, 2000; Gangloff, 2001). The action area portion of Chewacla Creek downstream from the enrolled properties currently maintains sufficient water to support mussel populations and their host fish. The only effects from the proposed project in this portion of the action area would be slight alterations in the timing of flow. Quantity of flow will be the same, only spread out to reflect a more natural flow regime for Chewacla Creek. Implementation of the SHA conservation measures will not result in take of any of the mussels in this section of the action area and should result in increases in the mussel populations above current baseline numbers.

### **CUMULATIVE EFFECTS**

Cumulative effects include the impacts of reasonably foreseeable future State, local or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of Act.

The Service consulted with the City, Water Board, and ADCNR to aid in our determination of future actions which may occur adjacent to or within Chewacla Creek within the action area, from Lake Ogletree Dam downstream to the downstream ADCNR/Phillips property boundary. Martin Marietta is continuing to operate a limestone quarry adjacent to the creek. Residential and commercial construction around the city of Auburn will continue in the foreseeable future, contributing to excess sedimentation and reductions in water quality for Chewacla Creek and

several of its tributaries. Although these actions are expected to continue within the action area in the future, conservation measures outlined in the EA and SHA should result in a reduction in adverse effects, an increase in beneficial effects to the creek, and will not contribute to take of the three listed mussels. Chewacla Creek may also be affected by other outside influences in the area of the enrolled properties. No other reasonably foreseeable future actions have been identified that would effect Chewacla Creek.

## **CONCLUSION**

After reviewing the current status of the ovate clubshell mussel, southern clubshell mussel, and fine-lined pocketbook, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the ovate clubshell mussel, southern clubshell mussel, or fine-lined pocketbook, and is not likely to destroy or adversely modify designated critical habitat. Critical habitat for these species has been proposed, but not finalized, for these species in portions of Chewacla Creek, however, this action will not affect that area and no destruction or adverse modification of that critical habitat is anticipated.

## **INCIDENTAL TAKE STATEMENT**

Sections 9 of Act and Federal regulation pursuant to section 4(d) of the Act prohibit take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed Chewacla Creek SHA and its associated documents clearly identify expected impacts to affected species likely to result from the proposed taking and measures that are necessary and proper to minimize those impacts. All conservation measures described in the proposed SHA, together with the terms and conditions described in any associated Implementing Agreement and any section 10(a)(1)(A) permit or permits issued with respect to the proposed SHA, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this Incidental Take Statement under 50 CFR § 402.14(I). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the Act to apply. If the permittees fail to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(A) permit and section 7(o)(2) may lapse. The amount or extent of incidental take expected under the proposed Chewacla Creek SHA, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the SHA and its accompanying section 19(a)(1)(A) permit.

## **AMOUNT OR EXTENT OF TAKE EXPECTED**

Mortality or unintended injury to listed mussels should not occur as a result of implementing conservation measures of the proposed action; however, should one or more of the applicants withdraw from participation in the SHA, take may result for all or part of these mussel populations above baseline conditions and habitat conditions would return to baseline conditions. Quantifying the take which might occur would be difficult, if not impossible, due to the numerous natural factors which will figure into the extent and nature of the expansion of the mussel populations once conservation measures have been implemented and stream flow restored to the creek. The incidental take would be in the form of indirect harm or mortality to the mussel species caused by negative effects to habitat conditions.

The amount of incidental take allowable is equal to the amount of habitat created and mussel population increase within the SHA properties above baseline conditions. Incidental take is not allowed for the baseline population of mussels, totaling one fine-lined pocketbook, as described above, without further endangered species consultation. Only 0.03 acre of the 5.97 total acres of habitat, which will be improved by the project, is currently occupied. Therefore, the maximum take of habitat which could result is 5.94 acres.

## **EFFECT OF THE TAKE**

In this BO, the Service has determined that the level of anticipated take is not likely to result in jeopardy to the three mussels identified above. Critical habitat has not been finalized for these species; therefore, none will be affected.

## **REASONABLE AND PRUDENT MEASURES**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the impacts of incidental take of the three listed mussels in Chewacla Creek.

The Service will issuance a section 10(a)(1)(A) permit to each applicant for the implementation of the proposed conservation measures, identified in the SHA, based on current biological information on the three mussel species.

## **TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The applicants must allow the Service, or its authorized representative, reasonable access to their property for the purpose of ascertaining the status of the covered species, habitat conditions, and/or elements of the baseline conditions present, and to conduct monitoring and compliance inspections in accordance with the SHA and associated ESP.

2. The applicants will provide to the Service annual stream flow, bioassessment, and water quality monitoring reports, as described in Attachment 3 of the SHA. The Service will review these documents and provide a timely response to the applicants with input and guidance toward continued implementation of conservation measures.

3. Should circumstances come to the attention of either the permittees or the Service that could result in unanticipated adverse effects to the three listed mussels, or their habitat, in Chewacla Creek, the party identifying the unforeseen circumstance must promptly notify the other. Within ten working days of such notification, representatives of the permittees and the Service will meet to discuss the unexpected circumstances, and will agree to proper corrective measures.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. The Service anticipates that implementation of the proposed conservation measures will not result in take and that only take above baseline conditions could occur if proposed conservation measures were discontinued. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Service must immediately provide an explanation of the causes of the taking and review with the need for possible modification of the reasonable and prudent measures.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize and avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We have not identified actions the Service could take to address section 7(a)(1) that are not part of our normally mandated mission. The Service will evaluate individual permit proposals, such as the ESP associated with this action, to identify opportunities to facilitate recovery of affected species.

### **REINITIATION NOTICE**

This concludes formal consultation on the action outlined in the opening paragraph. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Service involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take exceeds baseline conditions; (2) new information reveals effects of the Service's action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the Service's action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions about this project or this BO, please contact Mr. Darren LeBlanc of the Service's Daphne, Alabama Ecological Services Field Office at (251) 441-5859.

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**Attachment 1**  
Chewacla Creek Safe Harbor Agreement Map