CANDIDATE CONSERVATION AGREEMENT

Camp Shelby Burrowing Crayfish ***Fallicambarus gordoni***

September 2003

I. INTRODUCTION

This Candidate Conservation Agreement (Agreement) for the Camp Shelby burrowing crayfish, *Fallicambarus gordoni*, (CSBC) has been developed as a cooperative effort among State and Federal resource agencies in order to implement measures necessary for the conservation of the species. These measures are taken in accordance with the Endangered Species Act of 1973, as amended, 16 U.S.C.1531 *et. seq*. (Act). Implementation of this Agreement will significantly reduce or eliminate any current or potential threats to the CSBC and its habitat.

II. GOAL

The goal of this Agreement is to protect and improve CSBC habitats in Perry County, Mississippi, such that any current or potential threats are eliminated or significantly reduced to the degree that it is unlikely that the species will become threatened or endangered within the foreseeable future.

III. OBJECTIVES

The objectives of this Agreement are to identify and protect CSBC populations; develop and implement habitat management strategies that maintain or enhance the CSBC's wetland habitats; and monitor the response of the species to management. These objectives will be accomplished through the implementation of specific measures set forth in Sections X and XI of this Agreement.

IV. ADDITIONAL BENEFITS

The primary focus of this Agreement is the conservation of the CSBC and its habitat, which consists of pitcher plant bogs. However, other rare animal and plant species associated with these unique pitcher plant bog communities will likely also benefit. Therefore, the implementation of this Agreement may significantly reduce or eliminate threats to other species associated with these communities, such as *Calopogon barbatus* (bearded grass pink), *Plantanthera blephariglottis* (white-fringed orchid) and others.

Improvement and stabilization of the status of the CSBC will also facilitate future interactions among the involved parties (identified in Section V, below) under applicable State and Federal environmental laws and regulations.

V. PARTIES

Mississippi Department of Wildlife Fisheries and Parks
    Mississippi Museum of Natural Sciences (MMNS)

U.S. Department of Defense
    Mississippi Army National Guard, Camp Shelby, Mississippi (MSNG)

U.S. Department of Agriculture
    U.S. Forest Service, DeSoto National Forest (USFS)

U.S. Department of Interior
    U.S. Fish and Wildlife Service, Southeast Region (FWS)

The parties will implement and coordinate conservation actions of this Agreement, as set forth in Section X, below.

VI. AUTHORITY

The signatory parties enter into this Agreement under Federal and State law, as applicable, including, but not limited to section 2(c)(1) of the Act, (16 U.S.C. 1531(c)(1)), which states “the policy of Congress is that all Federal departments and agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes” of the Act.

The Act contributes several working tools to establish a cooperative working relationship among the parties toward conservation of the CSBC and the ecosystem on which it depends. Under section 6 the “Secretary shall cooperate to the maximum extent with the States...”, 16 U.S.C. 1535(a). Further under Section 6, the Secretary may authorize under cooperative agreement with a State program, a State agency to establish conservation initiatives; and may provide financial assistance to the State to monitor the status of a species within a State to prevent significant risk to the well-being of any such species, 16 U.S.C.1535(c).

All parties to this Agreement recognize that they each have specific statutory responsibilities that cannot be delegated, particularly with respect to the management and conservation of wildlife and its habitat. Nothing in this Agreement is intended to abrogate any of the parties’ respective responsibilities.

This Agreement is subject to and is intended to be consistent with all applicable Federal and State laws.

VII. STATUS AND DISTRIBUTION OF THE CSBC

The CSBC is a small burrowing crayfish less than 30 millimeters (1.5 inches) in length that was described in 1987 from southeast Mississippi (Fitzpatrick 1987). It is distinguished from closely related species by a broader rostrum, characters of the chela,

and characters of the male and female sexual organs. The species is found in association with flat woodland pitcher plant wetlands, locally referred to as pitcher plant bogs. Extensive surveys of pitcher plant wetlands in southern Mississippi and Alabama have documented the CSBC only from a small area in central Perry County, Mississippi (Fitzpatrick 1987, 1991, Johnston and Figiel 1995, Leonard *et al.* 1999, Eversole and Welch 2001, Welch 2002).

The CSBC is a short-lived (2 to 3 years) burrowing crayfish that estivates during dry summer months, and is active during late fall, winter, and spring (Johnson and Figiel 1997). Reproductively active males (Form I) are found throughout this activity period. Females bearing eggs have only been collected during late fall and early winter. Egg numbers range from 7 to 25 per female. Juveniles are present during most of the year, but are more frequently collected in the late spring. Burrows consist of a shallow oval chamber connected to the surface by one to four tunnels. High concentrations of burrows are found only in pitcher plant wetlands. Observations on the distribution of the species indicate that the maintenance of open-bog habitats is important to the survival of CSBC (Johnson and Figiel 1997, Eversole and Welch 2001, Welch 2002).

The CSBC appears to have a small, naturally limited range, which is typical of most species of *Fallicambarus* (Johnston and Figiel 1997). Extensive surveys of wetlands in southern Mississippi and Alabama have documented the CSBC only from a localized portion of the Leaf River watershed in central Perry County, Mississippi, within the DeSoto National Forest. All of this area is currently under lease to the Mississippi Army National Guard's (MSNG) Camp Shelby for troop and tank training grounds.

Surveys for CSBC have been conducted by Fitzpatrick (1991), Johnston and Figiel (1995), Leonard *et al.* (1999), Eversole and Welch (2001), and Welch (2002). A few other researchers have also made collections of this species (MS Natural Heritage Program Database). Currently CSBC have been found at 54 locations (Fig. 1). CSBC have only been found within the DeSoto National Forest and most sites are within the

Camp Shelby Training Site (Fig. 1). Early surveys suggested that CSBC were limited to a small area in the upper reaches of the Cypress Creek watershed (Fitzpatrick 1991). However, more recent surveys located a few populations of CSBC in the Beaumont Creek drainage (Eversole and Welch 2001). Welch (2002) developed a model based on hydrology, soils, etc., to predict the potential of CSBC occurrence. Applying the model in the upper and lower Cypress Creek watersheds, he was able to identify new CSBC populations in the upper Cypress Creek watershed. CSBC, however, were not found in predicted areas in the lower Cypress Creek watershed.

Originally CSBC were only found in pitcher plant bogs and this was believed to be the natural limit of its range. Welch (2002) sampled across habitat types and found CSBC in pitcher plant bogs, pitcher plant savannas (areas with higher pine density), and mixed palustrine wetlands that did not have pitcher plants; however, densities of burrows in the pitcher plant savannas with high pine densities and mixed palustrine wetlands were lower than in the pitcher plant bogs. Eversole and Welch (2001) collected a CSBC from a roadside ditch where pitcher plants were observed, but this is not typical pitcher plant bog habitat. While CSBC are not limited to open pitcher plant bogs, populations within this type of habitat are more robust.

Observations on the distribution of the species suggest that CSBC may be dependent on the maintenance of open-bog habitat for survival. CSBC populations found in pitcher plant savannas and mixed palustrine wetlands may be relict populations of pitcher plant bogs that have succeeded to later forest stages. Therefore, conditions where pitcher plants thrive are considered optimal for CSBC.

The CSBC was included in *Federal Register* notice of review for candidate species in 1991, 1994, 1996, 1999, 2001, and 2002. It was included as a Category 2 species in notices of review published in 1991 (56 FR 58804) and 1994 (59 FR 58982). At that time, a Category 2 species was one that was being considered for possible addition to the Federal List of Endangered and Threatened Wildlife, but for which conclusive data

on biological vulnerability and threat were not available to support a proposed rule. Designation of Category 2 species was discontinued in the February 28, 1996, Notice of Review (61 FR 7596). The CSBC was identified as a candidate species by the Service in the 1999 (64 FR 57534), 2001 (66 FR 54808), and 2002 (67 FR 40657) Notices of Review. A candidate species is defined as a species for which the Service has on file sufficient information on biological vulnerability and threats to support issuance of a proposed rule.

VIII PROBLEMS FACING THE SPECIES

The success of any conservation program is dependent on eliminating or significantly reducing the impact of threats to the species existence. This section provides a detailed review of the current threats to the CSBC that must be considered by the Service, as required by Section 4(a)(1) of the Act. In addition, this section establishes a baseline understanding of the current threats to the CSBC and its habitat, for the purpose of providing a framework for implementation of conservation measures needed to address those threats.

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The CSBC is believed to be naturally limited in range. It is found primarily in pitcher plant wetlands on USFS lands currently used by the MSNG Camp Shelby for troop and tank training. Approximately 117,000 of the 134,000 acres that comprise the Camp Shelby Training area are USFS lands authorized under a Special Use Permit to the MSNG for training purposes. Within the Camp Shelby Training area, all pitcher plant wetlands combined comprise less than 500 acres, and the CSBC has been associated with only some of these (M. Duran, Mississippi Department of Wildlife, Fisheries, and Parks, Hattiesburg, MS, *in litt*. 1999).

The CSBC is vulnerable to activities that would directly destroy its burrows, compact the soil, or alter the hydrology of its wetland habitat. The primary activities occurring in areas surrounding CSBC habitat include silvicultural activities by the USFS and tank and troop maneuvers by the MSNG. Silvicultural activities that could harm the species include complete canopy removal, toxic runoff from pesticide and herbicide applications, soil compaction and rutting from heavy equipment operation, and soil dessication that may result from some of these activities. MSNG troop and tank maneuvers within CSBC habitat can kill or entomb animals, compact the soil, and/or affect hydrology through rutting.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

CSBCs are not utilized for commercial or recreational purposes. Their cryptic habits also protect them from commercial, recreational, or scientific collection.

C. Disease or predation.

Diseases affecting the CSBC are unknown. Although a number of vertebrate predators are known to prey on CSBC, natural predation does not appear to be a threat.

D. The inadequacy of existing regulatory mechanisms.

CSBC wetland habitats have been considered under USFS (1987, 1989) management plans, and the MSNG's (2001) management plan. However, the species currently is not subject to any existing regulatory mechanism.

E. Other natural or manmade factors affecting its continued existence.

Pitcher plant bogs are naturally maintained by periodic burning. Fire exclusion results in shading, changes in soil moisture, and allows the invasion of other plant and animal

species that are not normally associated with these habitats, including competitive crayfish species.

All Terrain Vehicle (ATV) use is high in the area where the CSBC occurs. ATV trails have been observed through pitcher plant bogs inhabited by CSBC. Recreational ATV use in these areas may result in direct mortality to CSBC.

IX. CONSERVATION STRATEGY

The CSBC is a small crayfish that spends most of its life in underground burrows. Its cryptic nature makes it a difficult species to study, quantify, and monitor. However as noted above, the CSBC is highly adapted to pitcher plant bogs and wetlands in a relatively small area of Perry County. As far as is known, this represents the total historic range of the species. Surveys by MSNG and others over the past decade have identified 54 locations currently supporting CSBC. Densities of the species appear to be directly correlated with the condition of the habitat. Pitcher plant bogs and wetlands are easily delineated, and there are well developed management actions that have been shown to maintain and improve the bog habitat (e.g., periodic burning, select timber removal, etc.). Field evidence indicates that CSBC populations will respond favorably to the conditions resulting from such management. Therefore, the conservation actions outlined below focus on protection, management and improvement of the primary habitat of the CSBC (pitcher plant bogs and associated wetlands). We believe these habitat oriented actions will ensure the conservation of the CSBC and preclude the need for its protection under the Act. However, this will be confirmed through monitoring the response of CSBC populations to habitat management. Information obtained from surveys, habitat management, and monitoring will increase our understanding of the CSBC and its management needs, and this knowledge will be applied using the concepts of Adaptive Management and through periodic assessment and modification of conservation actions as needed (see Sections X and XI, below).

X. CONSERVATION ACTIONS TO BE IMPLEMENTED

In order to accomplish the goal and objectives of this Agreement, the parties agree to undertake the following specific measures:

A. HABITAT PROTECTION:

1. Upon execution of this Agreement by each of the signatory parties, the following guidelines, developed from the Mississippi Army National Guard's Integrated Natural and Cultural Resources Management Plan (2001), the U.S. Forest Service's Final Environmental Impact Statement for Vegetative Management in the Coastal Plain/Piedmont (1989), and the U.S. Forest Service's Forest Plan for the National Forests in Mississippi (1987), will be immediately implemented in wetland areas known to be occupied by CSBC:

   - A 100-foot protective buffer will be posted around occupied wetlands, and vehicles*, equipment*, off-road vehicles, livestock (horses), and pesticides will be prohibited within the buffer.
   - Fire breaks, fire lanes, or ditches will not be constructed through the occupied wetlands.
   - Timber harvesting in occupied wetlands will be limited to the removal of planted slash pines (see Habitat Management, below).
   - Occupied wetlands will not be replanted with trees.
   - No applications of herbicides will occur within occupied wetlands or their buffers except for treatment of noxious invasive weeds (e.g., cogon grass) using aquatic-labeled herbicides with prior approval by the CSBC Team (see Section XI, below).

   *Activities within the posted buffers that have been previously approved under the

Environmental Impact Statement for the Camp Shelby Special Use Permit Area on National Forest Land (i.e., existing and future firing ranges requiring limited periodic maintenance for line of sight, or ephemeral wetland crossings for tracked and wheeled armor on Combined Arms Area ranges) may be conducted upon development and approval of maintenance protocols and/or mitigation requirements by the CSBC Team (see Section XI, below).

Responsible Party: USFS, MSNG.

2. Within 6 months of the parties' signing of this Agreement, all existing ATV trails through wetlands currently known to be occupied by CSBC will be blocked and posted. Responsible Party: USFS, MSNG.

3. Prior to any construction, timber harvesting, or military training activities within pitcher plant wetlands in the upper Cypress Creek or Beaumont Creek watersheds, surveys will be conducted by the responsible Party to determine the presence or absence of CSBC in wetland areas. If CSBC are present, the Measures identified under Section X.A.1, above, will be implemented. Responsible Party: USFS, MSNG.

B. HABITAT MANAGEMENT

Wetlands are currently managed and protected to some degree by both USFS (1989, 1987) and MSNG (2001). Upon execution of this Agreement by the signatory parties, the following management actions will be implemented in CSBC occupied wetlands:

- Fire management: wetlands will be burned every 2 to 3 years during the growing season, beginning in 2004, weather permitting. Responsible Party: USFS.
- Erosion control: silviculture and military training activities in uplands draining into CSBC wetlands will employ erosion Best Management

Practices (BMPs); existing erosion problems near wetlands will be repaired. Responsible Party: USFS, MSNG.

- Hydrology: natural hydrological flow from adjacent uplands into CSBC habitats will be maintained. Responsible Party: USFS, MSNG.
- Restoration: slash pines will be removed from overgrown wetland areas where there are currently low densities of CSBC. Responsible Party: USFS.
- Timber management: slash pine removal will be by chainsaw when the soil is dry. Where possible, cut pines will be scattered at the site. If mechanical removal of trees is required, it will be monitored by a representative of MSNG or USFS to ensure minimal soil disturbance and compaction. Responsible Party: USFS.

C. MONITORING

Monitoring is an essential component of any conservation strategy and plan. However, as noted previously, CSBC live in subterranean burrows and are difficult to quantify. The presence of any species of burrowing crayfish, including the CSBC, is easily established in wetlands by the presence of burrow "chimneys." However, in order to identify the species of crayfish making the burrow, it is usually necessary to excavate the burrow. Although CSBC burrows may have one to four chimneys, and may be occupied by one or more individuals, the presence and density of burrows is a nondestructive measurement of crayfish response to management. CSBC are most abundant in open, high quality pitcher plant wetlands. Therefore, vegetation monitoring will also be an effective tool in assessing the health of the community and the CSBC, and the effectiveness of habitat management.

Within three months of execution of this Agreement by the signatory parties, a CSBC/vegetation monitoring plan will be developed and submitted to all parties

for approval. Upon approval of the monitoring plan, an initial burrow census will be conducted in areas known to be inhabited by CSBC. Vegetation baseline data will also be developed for each site.

Annual monitoring of selected habitats will be conducted during the initial term of this Agreement (see Section XII, below). Monitoring sites will be identified by the CSBC Conservation Team established in Section XI, below. Periodic limited excavation will be conducted to establish that CSBC is the species constructing burrows in the wetlands. Annual monitoring reports will be submitted to all parties by January 1 of each year. Responsible Party: USFS, MSNG. Census/monitoring techniques will be modified as information is developed.

D. EDUCATION AND INFORMATION TRANSFER

Awareness can promote higher levels of environmental stewardship and protection for the CSBC and its habitat. Activities within the areas occupied by the species include silviculture, troop training, hunting, and sport riding. Within one year of the execution of this Agreement by the signatory parties, educational materials describing pitcher plant wetlands, and the unique presence of CSBC and other sensitive species will be developed and distributed to targeted audiences, including the National Guard, loggers, and ATV users. Responsible Party: USFS, MSNG, FWS, and MMNS.

XI. CONSERVATION SCHEDULE AND ASSESSMENT

In order to meet the objectives of this Agreement, the conservation measures noted above will be implemented. In addition, four general administrative actions - coordinating conservation activities, conservation schedule implementation, funding conservation actions, and assessing conservation progress - will be implemented as outlined below:

Coordinating Conservation Actions

Administration of the Agreement will be conducted by the CSBC Conservation Team (CSBC Team). The CSBC Team will consist of one or more designated representatives from each signatory parties to this Agreement and may include technical and legal advisors and other members as deemed necessary by, and with the mutual consent of, the parties.

Because the CSBC is limited in distribution to lands under the management of the USFS, the designated CSBC Team leader will be the USFS representative.

Authority of the CSBC Team shall be limited to developing and making recommendations for the conservation of the CSBC. The CSBC Team will meet as needed, but at least once annually, to assess CSBC conservation efforts; review conservation results and new study proposals; and make recommendations to modify the Agreement as necessary.

Meetings of the CSBC Team will be open to interested entities. Minutes of the meetings will be kept and distributed by the CSBC Team leader to any interested entity, upon written request.

Conservation Schedule Implementation

All conservation actions set forth in this Agreement will be implemented upon execution of this Agreement by all parties, unless noted otherwise, and will remain in effect for the life of the Agreement.

As leader of the CSBC Team, USFS will coordinate the conservation activities and monitor the conservation actions being conducted by the signatories to this Agreement

to determine whether all actions are in accordance with the Agreement.

Funding Conservation Actions

Each party to this Agreement commits to seek funding for implementation of the conservation measures set forth in this Agreement. Funding for conservation actions will be provided by a variety of sources, including but not limited to:

1) Federal sources, including but not limited to, the USFS, MSNG, and/or FWS; and,

2) State funding sources, including but not limited to, the MMNS.

In-kind contributions in the form of personnel, field equipment, supplies, etc., will be provided by the parties and other entities who are not parties to this Agreement.

It is understood that all funding commitments made under this Agreement are subject to approval by each party's appropriation process and subject to the requirements of the Anti-Deficiency Act 31 U.S.C. 1341, *et seq*. This Agreement does not commit any participatory party to spend resources beyond its jurisdiction.

Conservation Progress Assessment

An annual assessment of progress towards implementing conservation actions will be made by the CSBC Team, based on monitoring reports, updates and evaluations by its members. This assessment will determine the effectiveness of this Agreement and whether revisions are warranted.

XII. DURATION AND AMENDMENT OF THE AGREEMENT

Long-term protection and management, as outlined in this Agreement, are necessary for the continued conservation of the CSBC. The initial term of this Agreement shall be ten (10) years. This Agreement shall be extended for additional five (5) year increments upon agreement by the parties until long-term habitat management and protection, and conservation of the CSBC is assured. Any party may withdraw from this Agreement upon sixty (60) days written notice to the other parties. Changes to this Agreement may be made upon agreement in writing of all the parties.

XIII. EFFECT OF THE AGREEMENT IN EVENT OF LISTING DECISION

It is the intent and expectation of the parties that the execution and implementation of this Agreement will lead to the conservation of the CSBC. If subsequent to the effective date of this Agreement the Secretary of the Interior should determine pursuant to section 4(a) of the Act (U.S.C. 1533(a)), that the CSBC is threatened or endangered, then signatory parties will participate in recovery planning for the CSBC.

XIV. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

Signing of this Agreement is covered under the authorities outlined in Section VI, above. We anticipate that any survey, collection, or research activities for implementation and maintenance of this Agreement will not entail significant Federal actions under the NEPA and will be given a categorical exclusion designation. All other actions will be evaluated prior to implementation and will comply with NEPA regulations.

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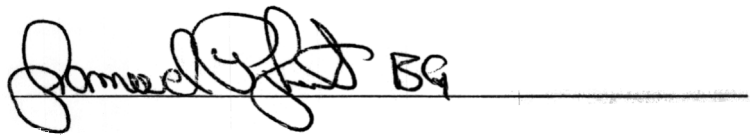

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September 2003

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Camp Shelby Burrowing Crayfish ***Fallicambarus gordoni***

September 2003

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Figure 1. Camp Shelby Burrowing Crayfish Locations