

A Status Survey of the Caney Fork Crayfish
(*Cambarus pristinus*) and Hardin County Crayfish
(*Orconectes wrighti*)

With notes on the Brawley's Fork crayfish (*Cambarus williamsi*)

Final Report



Photo courtesy Todd Crabtree

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Introduction and Summary

The Division of Natural Heritage (DNH) was contracted by the Tennessee Wildlife Resources Agency (TWRA) to conduct distributional surveys for two-state endangered crayfish, the Caney Fork crayfish (*Cambarus pristinus*) and Brawley's Fork crayfish (*Cambarus williami*) for fiscal year (FY) 04-05, the results of which were reported in August 2005. For FY 05-06 this contract was renewed and amended to include a third state-endangered crayfish, the Hardin County crayfish (*Orconectes wrighti*). As the vast majority of work on *C. williami* was completed during the FY 04-05 project, the current study touches only minimally on that species. Rather, this study focuses on potential unsampled *C. pristinus* sites identified during the FY 04-05 project, and on historical and novel sites potentially containing *O. wrighti*. Surveys for the three species were undertaken between fall 2005 and summer 2006.

Cambarus (Veticambarus) pristinus Hobbs was described in 1965 from specimens collected in Whiteoak Creek, Cumberland County, Tennessee (Hobbs, 1965). Its probable distribution is regarded as the sandstone-dominated tributaries of the upper Caney Fork drainage in Van Buren, Cumberland, White, and Bledsoe counties, Tennessee (Hobbs, 1989; Williams, 2001). The species was reported from ten sites (of seven streams) prior to the initiation of the FY 04-05 study, five of which were considered historical. That study documented the species from an additional six streams and reconfirmed two other locations in Cumberland County. The current effort documents the species from an additional nine sites in eight streams, and reconfirms three locations in Cumberland County. This adds six streams known to support *C. pristinus*, bringing the total known to nineteen.

Cambarus (Glareocola) williami Bouchard & Bouchard was described in 1995 from specimens collected in Brawley's Fork, Cannon County, Tennessee (Bouchard & Bouchard, 1995). This species is believed to be restricted to the cobble-dominated upper portion of the East Fork Stones River and its tributaries in Cannon County, Tennessee (Bouchard & Bouchard, 1995; Williams, 2001; Withers & McCoy, 2005). Prior to initial surveys conducted by the DNH 1999-2001, this species was only reported from the type locality, Brawley's Fork. The earlier DNH surveys documented the species in an additional eleven segments in nine streams. The FY 04-05 surveys documented the species at another 21 sites in nine streams, including the East Fork Stones River proper. Two previously known records were reconfirmed. The current study adds one new location and reconfirms two records first obtained in 1999-2000. *C. williami* is now known from eighteen streams in Cannon County.

Orconectes (Faxonius) wrighti Hobbs was described in 1948 from specimens collected in Robinson Creek, Hardin County, Tennessee (Hobbs, 1948). The species is believed to be restricted to a few tributary drainages of the Tennessee River from Alcorn County, Mississippi to central McNairy and Hardin counties, Tennessee (Hobbs, 1989; INHS, 2006; NMNH, 2006; Butler, 2002). All drainages containing the species empty into the left-descending bank of the Tennessee River, spanning approximately 19.5 river miles from Robinson Creek near Pickwick Dam to Beason Creek northeast of Adamsville. The species was known from four historical locations before 2005. The current study has documented the species at two of the historic locations, and reports them in another nineteen sites in seventeen streams. *O. wrighti* is now reported from nineteen streams in Hardin & McNairy counties in Tennessee.

Species Description and Habitat

Cambarus pristinus was described in Hobbs, 1965. Compared to their congeners, adults of this species can be recognized by the greenish-brown mottled pattern of the carapace and tail, comparatively large eyes, and distinct gonopod structure. The two congeners often found in the same habitats with *C. pristinus*, *C. parvovulus* and *C. sphenoides*, both have gonopods (first pleopods) with the central projection angled at least 90° away from the principal shaft of the appendage (see Hobbs, 1989). In

C. pristinus, however, the central projection is angled no more than 45° away from the principal shaft. Chelae of *C. pristinus* also express significantly more abundant setae than either congener. Total length of *C. pristinus* can range to approximately 10 cm.

Cambarus pristinus appears to be restricted to sandstone-derived streams of the upper Caney Fork drainage of the Cumberland Plateau. Williams (p.c.) has documented a strikingly similar species in similar habitats of the upper Sequatchie drainage, but believes this may represent an undescribed *Cambarus*. This “Sequatchie form” of *C. pristinus* is not treated in this study.

Cambarus pristinus is generally found in small to large streams under slabrock resting on bedrock, with interspersed small rocks, cobble, and sand, and occupying areas from 0-100% canopy cover. They may also be found under slabrock resting on wholly unconsolidated substrates. Williams *et al.* (2004) noted that during their surveys “the occurrence of *C. pristinus* was directly related to the presence of the preferred cover habitat- large flat rocks in shallow pools with slow current.”

Both *Cambarus pristinus* and *C. williamsi* are associated strongly with relatively headwater systems in their respective drainages.

A thorough description of *Cambarus williamsi* is presented in Bouchard & Bouchard, 1995. The distinguishing features of the species include its green to greenish brown color, small size, distinctively setose or “hairy” pincers, and burrowing habit. Adult specimens may reach a total length of up to approximately 3.5 cm. The areola is broad (4.2 to 6.6 times longer than broad), representing 37.4 to 41.1% of total carapace length (Bouchard & Bouchard, 1995). Males of the two species with which it is likely to be confused, *C. brachydactylus* and *C. friaufi*, differ from *C. williamsi* by having a gonopod with the central projection angled at least 90° away from the principle shaft of the appendage (Williams, 2001). The central projection of *C. williamsi* is only angled approximately 35° away from the principle shaft (Williams, 2001). The geometry of the annulus ventralis of female specimens also differs markedly from that of either *C. brachydactylus* or *C. friaufi*, and may be used to differentiate specimens if no males are available.

Cambarus williamsi is generally restricted to the gravel-cobble substrate of fast-moving streams in the escarpment of the Eastern Highland Rim of Cannon County. The species may be found in small burrows at or near the surface of cobble substrates in these streams, both in areas of uniform cobble distribution and in more isolated pockets of such material in streams with more prevalent bedrock. The density of specimens seems to be well correlated with the relative abundance of unconsolidated cobble and gravel substrates.

Orconectes wrighti is described in Hobbs, 1948. Body color is generally brownish olive-drab with greenish overtones, usually with a solid dark band at the most posterior portion of the carapace and a broken or lighter band bisecting the carapace laterally anterior to the areola. The second through fourth periopods express alternating light and dark bands, and the pincers are red-tipped with black bands posterior. Distinguishing characters of the species include setose pincers and carapace, large eyes, and distinctly curved gonopods. Adult specimens may range to a total length of approximately 7.9 cm. The “areola is moderately broad (5.9 times longer than broad) with four or five punctuations in narrowest part- punctuations crowded and strongly setiferous, particularly in cephalolateral portions; cephalic section of carapace about 2.1 times as long as areola (length of areola about 32.0% of entire length of carapace).” (Hobbs, 1948) The only Tennessee species that might be confused with *Orconectes wrighti*, *O. erichsonianus*, is remarkably less setose on the chelae and carapace, and only rarely expresses the broken band bisecting the carapace.

O. wrighti is endemic to the “Western Uplands” of the lower Tennessee River system, occurring generally in streams dominated by deposits of alluvial gravel (Butler, 2002). Of Robinson Creek, Dr. Mike Wright notes “the bottom of the creek was of red clay and gravel with a few rocks forming riffles. The flow was relatively slow and large pools of relatively quiet waters were formed. The pools had large amounts of clay along the shore in the deeper areas, becoming quite soft and muck in such regions. The water was about one foot deep at the gravel bars, deepening to as much as 5 or 6 feet in a few of the pools. The stream was 10 to 15 feet wide, heavily shaded, and had some water-side vegetation. Exposed gravel bars were occasionally found along the bank, at which damselflies congregated in considerable numbers.” (Wright, 1946 as noted in Hobbs, 1948) We have found *O. wrighti* habitats to be highly variable in respect to the relative amounts of sand and cobble in the substrate, but that sand is never more than co-dominant.

Methods & Materials

Prior to initiation of the current project, all known data sources for the three species were evaluated, and relevant records were incorporated into the Heritage Biotics GIS data system. Site selection in part was based on historical distribution, but especially for *C. pristinus* included sites identified for revisits during the FY 04-05 project.

The type locality for all species was visited both to update the database record and to familiarize DNH staff with the targets and sympatric species. Sites were then selected based on access to a public right-of-way (ROW), probable suitable habitat, and relationship to the target watersheds. Type localities for *C. williami* & *C. pristinus* were examined during the FY 04-05 surveys, while the type locality for *O. wrighti* was sampled initially during the current study.

Prior to the FY 04-05 study, historic records for *C. pristinus* were spaced approximately 29 miles apart with relatively few intervening collection sites. For FY 04-05 we sampled numerous streams that lie between the known limits of the species’ range, including nineteen segments of sixteen streams in Cumberland, Van Buren, and Bledsoe counties. That work resulted in six additional sites containing *C. pristinus*. The current study evaluated 61 segments of 45 streams in Cumberland, Van Buren, Bledsoe, and White counties, and portions of the Caney Fork, Calfkiller, Obed, Sequatchie, and Rocky River watersheds.

Survey sites for *C. williami* were selected to augment the earlier DNH research of the species (circa 2000-01). Because of the apparent restriction of the species to the upper East Fork Stones River drainage, emphasis was placed on surveying streams in the greater Woodbury area that had not been previously examined. During the FY 04-05 project a total of 44 segments of nineteen streams were inventoried for the species in Cannon and Rutherford counties where habitat seemed suitable, including three segments in the Caney Fork River drainage. The current study extended downstream surveys for the species in East Fork Stones River proper.

Orconectes wrighti survey sites were selected based in part on the previously estimated range of the species, and numerous tributaries to the larger streams were sampled, including additional portions of streams named in historical records. Additionally, apparently suitable habitats were sampled north, west, and northwest in streams believed to be outside of the historical range of the species, one stream was sampled on the right descending (east) side of the Tennessee River, and one site was likewise sampled in the Mississippi drainage. This study evaluated 66 sites in 51 streams.

Stream surveys were conducted during daylight hours, and with a few exceptions only during base flow of each stream examined. Sample crews ranged from one to four individuals, and for each station the approximate number of man-hours was calculated. Each segment was sampled using appropriately sized dipnets for the habitat in question. Potential *Cambarus pristinus* streams were sampled by overturning rocks and slabrocks and quickly netting beneath them. This was accomplished either individually by each crewmember, or as appropriate, by two to three crewmembers jointly. Potential *Cambarus williami* habitats were sampled either by a *de facto* kick seine method (but using large dip nets), or by pressing nets beneath cobble substrates and removing a portion of the material to the shoreline to examine for crayfish. *C. williami* could also be netted by careful excavation of visible burrows, and sometimes by netting individuals exposed atop the substrate. *Orconectes wrighti* was most frequently collected by dipnet from leaf litter or coarse woody debris (CWD), or by seining suitable locations.

Vouchered specimens will be submitted to the TWRA Reference Collection of Crayfish, with duplicates remaining in the DNH. Specimens collected during these surveys are noted in an associated file included with the electronic version of this report. All crayfish not collected as reference specimens were returned at or near the point of capture. Particular care was given to the handling of female specimens in berry or with early instar young.

For each site, approximate stream dimensions (width, depth) and flow were estimated, and basic descriptions of the habitat were recorded. When equipment was available, the temperature, pH, dissolved oxygen, and conductivity of water at each site were noted. Digital photographs were taken at each sample site, including close-ups of occupied habitat, as appropriate, and photographs of representative specimens caught at each location. Voucher specimens of target species were made only when necessary to confirm the presence of the taxon in streams from which it had not been documented. Normally one adult male and one adult female were collected and preserved in approximately 70% ethanol. In certain circumstances no voucher collection was made (e.g. when only one specimen of the target species was caught). In those instances photographs were made of the specimen in question. Voucher specimens of non-target species were made when necessary to confirm the identification of that species. No ovigerous female crayfish (bearing eggs or young) were collected for any taxa.

Site Descriptions

Stream segments surveyed for this study are summarized in Table 1 (including *C. pristinus* FY 04-06, and *C. williami* and *O. wrighti* FY 05-06) and an expanded table is included with the electronic version of this report. The table indicates the stream name, GPS reference, latitude and longitude as decimal degrees, USGS quadrangle name, county, and if the target species was found, the corresponding Heritage Biotics reference number. The temperature (Celsius), pH, dissolved oxygen (mg/l), and conductivity (as micromhos, uS) of each site are noted, when available. Flow is estimated as cubic feet per second (cfs). Catch per unit effort (CPUE) of the target species is presented as the number observed per man-hour. Site descriptions and survey information is presented, as appropriate. Tentative species identifications are preceded with “cf.” A number of sites identified for future surveys are included, particularly for *C. pristinus* and *O. wrighti*.

Landowner information for sites known to contain priority populations of *Cambarus pristinus* and *Cambarus williami* was presented in the FY 04-05 report. The Tennessee Natural Heritage Program

(NHP) will gladly assist with determining landowner information for other priority sites identified in this report.

Results & Discussion

Biotics records for all *Cambarus pristinus* and *Orconectes wrighti*, and for FY 05-06 records of *C. williamsi*, are presented in Appendix 1.

During the FY 04-05 surveys *C. pristinus* was documented at an additional six streams, and two previously documented sites from Cumberland County were reconfirmed. Two historic locations in Van Buren County were examined but *C. pristinus* was not observed. The current study documented the species from another nine segments and an additional six streams. One historic location did not reveal the species, but three others were reconfirmed. The species is now known from 24 sites in nineteen streams from the upper Caney Fork River watershed in Cumberland and Van Buren counties (Figure 1).

Several sites contained a particular abundance of *C. pristinus*, including Puncheoncamp Creek, Laurel Creek, and West Fork Creek. Each of these sites should be a high conservation priority.

Puncheoncamp Creek, a tributary flowing into the Caney Fork in the TWRA Centennial Wilderness, contained an outstanding population of *C. pristinus* (CPUE 12.9). The site at Puncheoncamp Creek Road is approximately 1.4 stream miles upstream of the present Centennial property boundary. We did not determine whether the species occurs in Puncheoncamp Creek within the current borders of Centennial, but believe strongly that the addition of the balance of the Puncheoncamp Creek watershed to Centennial represents an urgent and necessary conservation action. The 2006 Bowater sale of much of the Puncheoncamp Creek watershed to a timber management company represents a unique opportunity for the TWRA to seek permanent easements, streamside management zones (SMZ), or fee simple ownership of critical tracts.

One stream on the TWRA Centennial Wilderness, Polly Branch, was sampled extensively but did not produce *C. pristinus*.

C. pristinus was documented at two sites in **West Fork Creek**, including Taylors Chapel Road (CPUE 2.5) and Browntown Road (CPUE 6+). The Browntown Road population appears the more robust and dense, and the CPUE does not adequately reflect this observance. Numerous adult *C. pristinus* were visible under rocks and slabrocks at the site but were not collected and were excluded from the CPUE calculation.

The population in **Laurel Creek** at Webb Road (CPUE 6+) is likewise robust, with *C. pristinus* the most abundant crayfish species. Numerous specimens also were visible under rocks that were not collected or used to determine the CPUE.

Other sites that exhibited a particular abundance of the species include West Fork (Little Cane Creek) at Newton Road (CPUE 6.7-13.3), and Jumping Branch at Flat Rock Road (CPUE 9.1). The former is remarkable not only for the presence of *C. pristinus*, but also for the abundance of Pleurocerid snails at the site (cf *Elimia* sp.)- the only such survey site to contain them. West Fork at this site also is used for baptisms by at least one local congregation.

Henderson Branch at Spring Gap Road (CPUE 4+), like Laurel Creek and Puncheoncamp Creek, hosted numerous adult *C. pristinus* that were observed but not collected. This stream also was notable for its small size (second order), having only an estimated 889 acres in the drainage area upstream of this point. The stream in the sample reach was deeply shaded and contained a diverse assemblage of woody and herbaceous plants.

Maple Branch at Glade Creek Road (CPUE 6.0) was reported to contain *C. pristinus* by the TWRA in 2004 and was reconfirmed during these surveys. We observed numerous specimens under cover rocks that were not collected.

Bridge Creek at Cumberland Cove Road is the only sample point taken within the Calfkiller River drainage. The suspicion was that the Calfkiller system might support *C. pristinus* as a tributary to the Caney Fork. At this site, however, we found a dense population of a similarly patterned Bouchard's crayfish (*Cambarus crinipes*), apparently the first documented occurrence of this species in the Calfkiller or Caney Fork drainage.

Little Obed River at SR127 was sampled in concert with Roger Thoma (Ohio State University, OSU) and as anticipated, no *C. pristinus* was collected. This site is part of Thoma's continuing investigation of an undescribed *Cambarus* that is apparently endemic to the Emory-Obed system. The Little Obed at this location, however, is notable for a pervasive and apparently introduced population of *Orconectes placidus*.

Specimens of *Procambarus* cf *lophotus* species were again collected from Glade Creek at the CC Road in Bledsoe State Forest, where they appear to be abundant and thriving. This unexpected occurrence first came in FY 04-05 from a stream segment that until recently had been largely impounded due to logjams, siltation, and probable beaver activity. During the current study the same *Procambarus* was found in two other segments of Glade Creek and in one tributary. No *C. pristinus* was collected in Glade Creek or its tributaries.

Several streams were presumably impacted by pre-law mining leachate, upstream impoundments, or both. These include Millsea Branch at the confluence of Clifty Creek, Camps Gulf Branch at SR285, and Duncan Creek at Mayland Road. Millsea Branch and Camps Gulf appeared to be the most egregiously contaminated, with a pH reading of 3.73 at the former. Camps Gulf had little aquatic life of any kind and a strong, unidentifiable odor. Duncan Creek appears to be impaired by discharges from an upstream impoundment.

Flynn Creek along Flynn Creek Road contained excellent physical habitat and deep shade, but was severely degraded by sediment from further upstream and from Sawmill Branch. Both streams may be impacted by discharges from the Cumberland County landfill, which straddles the divide between the two streams. TDEC-Water Pollution Control (WPC) has initiated an investigation.

Raccoon Creek was surveyed at a logging road crossing and *C. pristinus* was found in small number. Deep mud was noted at the site. TDEC-WPC, TWRA, and the Tennessee Division of Forestry (TDF) conducted a follow-up investigation and determined that the BMP's in place were adequate.

At Harper Branch of the Rocky River drainage we discovered numerous *Cambarus* cf *sphenoides* with whitish undersides, apparently caused by the protozoan *Thelobania contejeani*, known to affect crayfish in this manner and generally believed to be fatal (Roger Thoma, p.c.). We are uncertain if this

represents an epizootic in particular streams, or if it is associated with environmental stressors or other factors. Though we did not encounter any *C. pristinus* specimens appearing to be infected, we did diagnose another *Cambarus* specimen in a tributary to Laurel Creek similarly.

This study indicates that the primary threat to *C. pristinus* populations comes from siltation associated with poor silvicultural and agricultural practices. Many of the sub-watersheds occupied by the species drain considerably large tracts of private forestlands and pastures. During these surveys certain stream segments were inadequately protected from sediment transported from nearby timberlands and associated roads. We also noted several sites where livestock had unrestricted access to streams occupied by *C. pristinus*. Proper BMPs for erosion control would help maintain *C. pristinus* habitats in a natural state.

At the present time residential development pressures on streams occupied by *C. pristinus* appear to be minimal.

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Cambarus williami was documented at an additional 21 sites in nine streams during the FY 04-05 study and two previously documented sites in Brawley's Fork were reconfirmed. For FY 05-06 the species was reconfirmed at one location first discovered in 2001, and located further downstream in East Fork Stones River proper. The species approaches but apparently does not enter Rutherford County. *C. williami* is now known from 34 sites in eighteen streams, all in the East Fork Stones River drainage of Cannon County.

The greatest relative abundance of the species was documented at several locations in the East Fork Stones River upstream of Woodbury, including East Fork at SR53 (11.9 specimens per man-hour), and at three more headwater sections adjacent to Stones River Road (10.0-11.9 specimens per man-hour). Conservation of the East Fork upstream of Woodbury should be a high priority. A brief revisit to this segment in August 2006 confirmed the high density of specimens noted during the FY 04-05 study.

The primary threat to *Cambarus williami* also appears to be sedimentation. The greater Woodbury area is experiencing considerable residential growth and a concomitant increase in the construction of new or improved utilities to service that growth. During the FY 04-05 study a gas pipeline was being installed hurriedly alongside the East Fork Stones River in the escarpment to the Eastern Highland Rim. Poor erosion control and several stream crossings caused a significant amount of unconsolidated material to enter this uppermost part of the watershed. Though the actual impact of such activity on *C. williami* cannot be determined at present, streams in which the species has been thought to flourish (e.g. Brawley's Fork) have only minimal suspended or buried sediment.

And while the largely rural, agricultural nature of much of the area is of great benefit to the integrity of streams supporting *C. williami*, certain areas are apparently void of the species due to that same relationship. We noted at least one site that appeared to have good physical habitat for the crayfish, save for the unobstructed access that cattle had to the creek. This particular stream, Doolittle Branch, had become stagnant and eutrophied, and with no canopy cover, was far warmer than other similar segments. The stream likely supports the species in other more upstream segments, however.

Though apparently wholly restricted to the upper East Fork Stones River drainage of Cannon County, *C. williamsi* is apparently secure in the area. Status of the species should be evaluated periodically as the area continues to grow.

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Orconectes wrighti was reconfirmed at the two historic locations examined and further documented at nineteen segments of seventeen streams, from the Mississippi state line to the greater Adamsville area in Hardin & McNairy counties (Figure 2). In certain streams the species is abundant and thriving, far outnumbering other lotic crayfish species. In other systems with similar habitats the species appears to be wholly absent. While this study cannot with certainty identify causal agents for their absence, many streams appear potentially and severely impacted by poor agricultural practices, limited riparian buffers & in-stream habitat diversity, improper ATV use, and competition from other species.

The most significant *O. wrighti* populations are believed to exist in the following streams: Beason Creek (including North and South Fork Beason, Dollar Creek), Fulwood Branch (Snake Creek), Little Owl Creek, Middle Fork Owl Creek, Dillon Branch (Owl), Chambers Creek, and Robinson Creek. Portions of each of these watersheds should be a high conservation priority.

Beason Creek Watershed

Several high priority sites were found in the Beason Creek drainage. These include North Fork Beason Creek at Glendale Road (CPUE 10.6) and at Old Union Road (CPUE 5.6), South Fork Beason Creek at SR69 (CPUE 9.3), Beason Creek at Seaton Loop (CPUE 7.3), Dollar Creek at Old Morris Chapel Road (CPUE 6.4), and Stratton Branch at Old Morris Chapel Road (CPUE 2.3). Because the Beason Creek drainage appears to be the northern limit for *O. wrighti*, protection of stream segments in greater Adamsville is imperative. And while growth in the community may not be rapid, we noted that Dollar Creek at North Elm Street (city limit) appeared to be severely polluted. This is approximately 2 stream miles upstream of the Old Morris Chapel Road site, so clearly the stream recovered substantially over that distance. Ironically, the Adamsville sewer plant and waste lagoon lies between these two points, and discharges to Dollar Creek.

Snake Creek Watershed

O. wrighti appears to be relatively sparsely distributed in the Snake Creek watershed, but was found at two tributaries on SR117 south of Adamsville (Clear Creek, Graham Creek). Of these, Clear Creek is clearly the higher priority. *O. wrighti* was located at two sites, indicating a probable three-mile distribution in that system (from SR224 to SR117), with CPUE values of 2.5 (SR117) and 6.0 (SR224). Much of the balance of Snake Creek and its tributaries appears to be channellized and deeply incised, dominated by shifting sandy substrates, or both- making such sites unlikely to support *O. wrighti*. A number of tributaries are noted in electronic version of Table 1 as possible revisit sites, and other more upstream tributaries and segments away from public ROWs also should be evaluated (e.g. Yellow Bank Creek, Factory Branch, portions of Lick Creek tributary to Snake Creek). We also believe that Fulwood Branch @ SR117 is a good candidate based on its proximity to the confluence of Owl Creek and Snake Creek. All of the known Snake Creek tributaries supporting the species occur in the lower 6 stream miles of Snake Creek.

Owl Creek Watershed

Owl Creek rivals Beason Creek in the number and apparent vitality of *O. wrighti* sites and populations documented in this survey, with seven locations in six streams supporting the species. These streams include Winningham Branch, Howell Branch, Dillon Branch, Middle Fork Owl Creek, Little Owl Creek, and Owl Creek proper. CPUE values ranged from 2.0 (Winningham Branch) to 7.5 (Little Owl Creek), though juvenile specimens dominated the latter site. Middle Fork Owl Creek was interesting on two levels- that only juveniles were observed at this site, and that numerous fossilized mussel shells (*Exogyra costata*) were present in the exposed marl. A particular disappointment with Owl Creek (but noted elsewhere as well) is the preponderance of ATV use in parts of the watershed. Several vehicles entered Owl Creek @ SR142 during one sample trip and sped off downstream, within the channel. This site is occupied by *O. wrighti*. Unfortunately, the species was not documented in streams on Shiloh National Military Park (NMP) despite apparently ideal substrate, cover, and minimal sediment. We certainly expected the species from lower Glover Branch near the confluence with Owl Creek, but that site was dominated by *Orconectes (Trisellescens) etnieri* and *Cambarus cf. striatus*. We believe that lower Glover Branch (on Shiloh NMP) and Shiloh Branch at Hurley need further inspection for *O. wrighti*.

Chambers Creek Watershed

Only one occurrence of *O. wrighti* was found in the Chambers Creek watershed, though five streams and six sites were sampled. The only extant occurrence came from Chambers Creek at the confluence of Hoover Branch at Campbell Mill Road, on the southern fringe of the TWRA Chambers Creek Wetland Area. Several streams that contained apparently appropriate cobble substrates and cover- including Leath Creek, upper Hoover Branch, and Woods Branch- did not reveal *O. wrighti*. Other sites- including Battles Branch and many others noted for possible revisits- were deeply incised, contained heavy sediments, or were impacted by beaver. Further attention needs to be given to the *O. wrighti* population at the Chambers Creek Wetland Area, to other Tennessee tributaries not accessed in this study (e.g. Wardlow Creek, Waldrop Creek, Singleton Creek) and to those Chambers Creek tributaries in Mississippi. The Illinois Natural History Survey (INHS) reported the species from a Mississippi tributary to Chambers Creek in 1996.

Robinson Creek Watershed

The population of *O. wrighti* in Robinson Creek (type locality), though robust (CPUE 2.7 & 3.7), appears restricted to the main stem and to the lower end of Houston Branch. The species was not found in upper Houston Branch. This makes the conservation of this system a high priority, as only a fraction of the watershed occurs on public lands (Pickwick Landing State Park, TVA Pickwick Reservoir Reservation). Other nearby Tennessee River tributaries- including Sulphur Creek, Winn Springs Branch, and Red Sulphur Springs Branch- have apparently suitable cobble substrates and cover. The former was sampled but *O. wrighti* was not discovered. The latter two are suggested as sites to revisit.

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Despite extensive inventory, *O. wrighti* was not found on the Shiloh NMP, though it could be present in extremely small numbers. Also remarkable is the apparent absence of the species from the Lick Creek watershed, despite numerous and repeated attempts to locate the species in

apparently suitable environments. Nor was the species found in smaller direct Tennessee River tributaries within the known range of *O. wrighti*, including Gattis Creek and Wicker Branch. These streams appear to be dominated by *O. etnieri*.

One outcome from this study has been the discovery of the strikingly similar species *Orconectes (Crockerinus) erichsonianus* in Stewman Creek, approximately 14 air miles from the nearest *O. wrighti* location. This appears to be the mostly southerly and westerly known population of *O. erichsonianus* on the left-descending side of the Tennessee River in the state, and is separated from the Beason Creek drainage by two major and four minor tributaries to the river. Another population was previously reported from Turnbo Creek in Decatur County (INHS, 2006). After careful examination of the putative *O. wrighti* and *O. erichsonianus* collections, the tentative identifications were determined to be valid. Although there appears to be significant similarity in the Form I gonopods of the two species, they may be separated by the density of setae on the chelae and by the structure of the annulus ventralis.

Conclusions and Recommendations for further study

Cambarus pristinus exhibits a rather spotty distribution throughout the upper tributaries of the Caney Fork River system. Several locations with apparently suitable physical habitat, forest cover, and flow regime did not reveal the species (e.g. Farmers Creek, and Laurel Creek at Taylors Chapel Road). Others however included surprisingly dominant populations, especially given the headwater nature of these tributaries (most notably, Henderson Branch and West Fork Creek). Though the current study could not establish firm causal relationships controlling presence and abundance of *C. pristinus*, we suspect that sediment load and substrate suitability play major roles. Two streams in particular bear further inspection, Spring Creek and Beam Creek. In these systems *C. pristinus* was only observed as young-of-the-year (YOY), and no adults were collected. Spring Creek, in particular, has relatively little sediment and abundant, layered rock and slabrock substrates, making effective sampling extremely difficult. By contrast, Beam Creek has a particularly heavy sediment bed load, possibly limiting the success of *C. pristinus* in that system.

One small segment of Oldfield Branch within Bledsoe State Forest was inhabited by *C. pristinus*, and other streams on the forest are expected to support the species. At present however this appears to be the only extant population on public lands, as *C. pristinus* has not been found in Glade Creek at Bledsoe State Forest, and the Fall Creek Falls State Park record is now considered historical.

At the conclusion of this study we believe that we have sampled nearly all publicly accessible stream crossings within the probable range of the species. We encourage the TWRA to expand these surveys to streams and segments found wholly within private lands, especially those that these data suggest may contain key populations. Most notably, we suggest a more thorough investigation of the Puncheoncamp Creek, Laurel Creek, Little Cane Creek, Spring Creek, Beam Creek, Potts Creek, and Hughes Creek watersheds. We also believe that a recheck of Polly Branch on Centennial Wilderness is warranted, along with Big Laurel and Little Laurel creeks immediately west of the TWRA property.

In addition to surveys into other streams within the known range, inventories for the species should continue in segments from other headwater streams of large Caney Fork tributaries outside of this range. Surveys may include sandstone-dominated streams feeding the Falling Water, Calfkiller, Rocky, and Collins river systems in the Cumberland Plateau.

* * *

Although *Cambarus williami* appears to be well distributed throughout the upper East Fork Stones River watershed in Cannon County, numerous streams and stream segments have yet to be examined. Additional portions of the East Fork Stones River between Gooch Ford (Rutherford County) and Culpepper (Cannon County) should be surveyed to determine the most downstream location for the species. The occurrence of *Cambarus cf. friaufi* from Northcutt Branch, a downstream tributary to the East Fork Stones, suggests that *C. friaufi* and *C. williami* may have overlapping ranges in at least a portion of the watershed. This relationship needs to be further examined.

Additional surveys of spring-fed headwater streams in the adjoining drainages (Duck, Collins, Caney Fork, and Middle Fork Stones) need to be undertaken to determine the fidelity of *Cambarus williami* to the East Fork Stones River basin. The Duck and East Fork drainages are commingled in at least one location, as Burk Cave, a sinkhole in the Duck River drainage of Coffee County, pirates water beneath the drainage divide and into the headwaters of Brawley's Fork. Other such situations likely exist and associated streams need to be evaluated for the presence of *C. williami* or closely allied species. Of special interest is Mountain Creek draining east from Short Mountain. This stream was not sampled over the course of this inventory. Also, Doolittle Branch (East Fork Stones) should be inventoried in its more ecologically intact headwater sections, as should any perennial springs feeding it.

* * *

Perhaps the most perplexing issue concerning the distribution of *O. wrighti* is its proximity and relatedness to *O. erichsonianus*. At present we do not believe the two species to be sympatric, though numerous streams remain to be sampled between the two closest populations. The latter species is reported from Turnbo Creek in Decatur County, and this study documented the same from Stewman Creek in Decatur County as well.

Although several streams lying between Turnbo Creek and the Beason Creek drainage were investigated, many others remain. Of those investigated, however, none revealed *O. erichsonianus* or *O. pagei*, the latter reaching the southern end of its distribution in the White Oak Creek watershed (Taylor & Sabaj, 1997). Representative segments of these Tennessee River tributaries need to be inventoried, including Doe Creek & its tributaries, and several south-flowing tributaries to White Oak Creek along SR69.

Because of the paucity of first-form male *O. wrighti* collected in this study, we strongly recommend that further confirmation of the most northerly *O. wrighti* sites through collection of adult males in reproductive molt. Additionally, first-form male *O. erichsonianus* are needed from both Turnbo and Stewman creeks. While we noted minor differences in the second-form gonopods of putative *O. wrighti* and *O. erichsonianus*, the gonopods of at least one Form I *O. wrighti* bore a strong resemblance to published accounts of those structures of *O. erichsonianus*. Other characters, however, clearly indicated these specimens to be *O. wrighti*. We are uncertain, however, whether these particular specimens reflect an aberrant gonopod structure or express particular character plasticity within the range of *O. wrighti*. The genetic relationships between proximal *O. wrighti* and *O. erichsonianus* populations should be elucidated.

* * *

Conservation opportunities for the two *Cambarus* are many. Several *C. pristinus* sites are significantly influenced (or wholly surrounded) by large tracts of corporate timberland. We encourage the TWRA to engage these landowners in measures that protect and enhance the integrity of streams occupied by *C. pristinus*. Acquisition and restoration of critical watersheds is strongly advised.

At present no public lands exist in the East Fork Stones River watershed of Cannon County. These surveys have identified several landowners who border significant lengths of streams occupied by *C. williamsi*, or who control much of these streams' drainage areas. We encourage the TWRA to review the potential sales of farms and larger tracts that adjoin streams occupied by the species, in order to bring a portion of the occupied range into public ownership. We also hope the Agency will evaluate ongoing land use in the upper East Fork Stones watershed and work with private landowners to address means by which to protect streams occupied by *C. williamsi*.

Priority conservation sites for *O. wrighti* should include at least one stream segment in each of the drainages occupied by the species: North and South Forks of Beason Creek, Snake Creek, Owl Creek, Chambers Creek, and Robinson Creek. The Robinson Creek population is only marginally protected by Pickwick Landing State Park and TVA Pickwick Reservoir Reservation, and needs additional portions of the watershed set aside in public ownership. The same is true for the Chambers Creek population, the single known observation occurring only proximally to the TWRA Chambers Creek WMA, in a popular unregulated stream recreation area. The TWRA may extend some benefit to the population in Dollar Creek, Adamsville, by partnering with that city to enhance water quality along that portion of the creek they own, and further by working cooperatively with TDEC to ensure that discharges from the Adamsville sewer plant are protective of *O. wrighti*.

Staff from the DNH is available to assist with prioritization of sites for conservation action for each of these species. We strongly encourage the TWRA and its partners to carefully analyze the land use-land cover attributes of the watersheds supporting populations of these species, and to further investigate the biotic and abiotic factors influencing their distribution. With no sustainable populations of *Cambarus pristinus*, *Cambarus williamsi*, or *Orconectes wrighti* in public ownership, we believe that conservation action needs to focus quickly on these species.

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Table 1: Surveyed Stream Segments

Project Name	Date	Site Name	# Target Specimens Observed	Latitude (dd.dddd)	Longitude (dd.dddd)
Cambarus pristinus	2-Jun-06	Beam Creek @ Claysville Road	0	35.97497	-85.14172
Cambarus pristinus	10-Aug-06	Beam Creek at gravel road adj U.S. 70N	0	36.01116	-85.13866
Cambarus pristinus	10-Aug-06	Beam Creek upst. Claysville Road	3	35.97634	-85.14126
Cambarus pristinus	13-Jun-06	Beaverdam Branch (Dry Fork) @ SR 111	0	35.6788	-85.47604
Cambarus pristinus	12-Apr-06	Beaverdam Creek (Bee Creek) @ SR 101	0	35.73503	-85.19554
Cambarus pristinus	6-Jun-06	Beaverdam Creek (Bee Creek) @ SR 101	0	35.73503	-85.19554
Cambarus pristinus	7-Jun-06	Bee Ck @ SR 101	0	35.76296	-85.169
Cambarus pristinus	12-Apr-06	Bee Creek @ Grapevine Road	0	35.76951	-85.14882
Cambarus pristinus	15-Jun-06	Bee Creek @ Mutts Road	0	35.79466	-85.09723
Cambarus pristinus	13-Jun-06	Big Branch @ Rocky River Road	0	35.57466	-85.52322
Cambarus pristinus	20-Apr-05	Big Branch @ timber road	0	35.93324	-85.17426
Cambarus pristinus	8-Jun-06	Big Pole Bridge Branch @ Eastland Road	0	35.90573	-85.31026
Cambarus pristinus	11-Apr-06	Bridge Creek @ Cumberland Cove Road	0	36.06019	-85.2461
Cambarus pristinus	7-Aug-06	Bridge Creek @ Cumberland Cove Road	0	36.06019	-85.2461
Cambarus pristinus	26-May-06	Camps Gulf Branch @ SR 285	0	35.7307	-85.33797
Cambarus pristinus	7-Jun-05	Cane Creek @ Park Road	0	35.66093	-85.34688
Cambarus pristinus	Historic	Cane Creek @ Park Road		35.66093	-85.34688
Cambarus pristinus	7-Jun-05	Cane Creek @ SR 284	0	35.64007	-85.33342
Cambarus pristinus	1-Jun-06	Cane Creek @ SR30	0	35.74316	-85.39275
Cambarus pristinus	Historic	Caney Fork @ Bud Tanner Road		35.99128	-85.18063
Cambarus pristinus	2-Jun-06	Caney Fork @ Bud Tanner Road	2	35.99128	-85.18063
Cambarus pristinus	8-Jun-06	Caney Fork @ Taylors Chapel Road	0	35.91973	-85.18844
Cambarus pristinus	Historic	Caney Fork @ Taylors Chapel Road		35.91973	-85.18844
Cambarus pristinus	Historic	Caney Fork @ US 70		35.97079	-85.15672
Cambarus pristinus	15-Jun-06	Caney Fork @ US 70	1	35.97079	-85.15672
Cambarus pristinus	20-Apr-05	Caney Fork River @ Clifty	0	35.89108	-85.21786
Cambarus pristinus	10-Apr-06	Clifty Creek @ Eastland Road	0	35.8863	-85.25152
Cambarus pristinus	8-Jun-06	Clifty Creek @ Jimmy Dickens Road	0	35.93378	-85.27104
Cambarus pristinus	10-Aug-06	Clifty Creek @ Jimmy Dickens Road	0	35.93378	-85.27104
Cambarus pristinus	10-Apr-06	Clifty Creek imm. upst. confl. of Millsea Br	0	35.8863	-85.25152
Cambarus pristinus	7-Jun-06	Confluence of Flynn Creek & Sawmill Br.	0	35.85741	-85.15047
Cambarus pristinus	12-Apr-06	Coon Hollow Branch @ CMSP	0	35.89899	-85.00035
Cambarus pristinus	15-Jun-06	Cooper Creek @ Browntown Road	0	35.91143	-85.21561
Cambarus pristinus	11-Apr-06	Daddy's Creek @ Blalock Road	0	35.76204	-85.08104
Cambarus pristinus	7-Jun-05	Dry Fork @ Old SR 111	0	35.69783	-85.48621
Cambarus pristinus	19-Apr-05	Duncan Creek @ Mayland Road	0	36.00199	-85.20186
Cambarus pristinus	2-Jun-06	Duncan Creek @ Mayland Road	0	36.00199	-85.20186
Cambarus pristinus	15-Jun-06	Farmers Creek @ aband. Mecca Road	0	35.82714	-85.12981
Cambarus pristinus	1-Jun-06	Flat Creek @ Old Spencer Road	0	35.66337	-85.25292
Cambarus pristinus	7-Jun-06	Flynn Creek @ Flynn's Cove Road	0	35.85756	-85.15204
Cambarus pristinus	20-Apr-05	Gentry Creek @ Lowe Rd	0	35.90546	-85.15811

Cambarus pristinus	7-Jun-05	Glade Creek @ CC Road	0	35.71245	-85.26347
Cambarus pristinus	1-Jun-06	Glade Creek @ CC Road	0	35.71245	-85.26342
Cambarus pristinus	1-Jun-06	Glade Creek @ Heptner Road	0	35.68805	-85.25338
Cambarus pristinus	6-Jun-06	Glade Creek @ SR 285	0	35.75937	-85.26507
Cambarus pristinus	6-Jun-06	Glade Creek @ SR 30	0	35.67541	-85.25327
Cambarus pristinus	12-Apr-06	Glade Creek near Bledsoe SF	0	35.73392	-85.26978
Cambarus pristinus	11-Apr-06	Grassy Cove @ Periwinkle Spring	0	35.82723	-84.90593
Cambarus pristinus	13-Jun-06	Harper Branch @ Rocky River Road	0	35.60509	-85.55748
Cambarus pristinus	7-Jun-06	Henderson Branch @ Spring Gap Road	12	35.82187	-85.16057
Cambarus pristinus	2-Jun-06	Hood Branch @ Claysville Road	0	35.97335	-85.13487
Cambarus pristinus	8-Jun-05	Jumping Branch @ Flat Rock Road	10	35.866	-85.18389
Cambarus pristinus	20-Apr-05	Laurel Creek @ Erasmus	1	35.88769	-85.18757
Cambarus pristinus	8-Jun-05	Laurel Creek @ Flynn's Cove Rd	0	35.8569	-85.15765
Cambarus pristinus	7-Jun-06	Laurel Creek @ Flynn's Cove Road	0	35.8569	-85.15761
Cambarus pristinus	14-Jun-06	Laurel Creek @ SR 101	3	35.84082	-85.13202
Cambarus pristinus	7-Jun-06	Laurel Creek @ Webb Road	10	35.84043	-85.12339
Cambarus pristinus	15-Jun-06	Laurel Creek @ Webb Road	13	35.84043	-85.12339
Cambarus pristinus	12-Apr-06	Little Cane Creek @ Newton-Winesap Rd	0	35.78794	-85.20786
Cambarus pristinus	12-Apr-06	Little Laurel Creek @ Winesap	0	35.79079	-85.1657
Cambarus pristinus	11-Apr-06	Little Obed @ SR127	0	35.97619	-85.03816
Cambarus pristinus	Historic	Maple Branch @ Glade Creek Road		35.98578	-85.23138
Cambarus pristinus	15-Jun-06	Maple Branch @ Glade Creek Road	3	35.98578	-85.23138
Cambarus pristinus	20-Apr-05	Meadow Creek @ Lowe Rd	3	35.8882	-85.17751
Cambarus pristinus	20-Apr-05	Meadow Creek upst Meadow Park Lake	0	35.90686	-85.09555
Cambarus pristinus	26-May-06	Mill Branch @ County Road	0	35.72025	-85.34851
Cambarus pristinus	12-Apr-06	Mill Creek @ Correctional Facility	0	35.73513	-85.25
Cambarus pristinus	8-Jun-05	Miller Branch @ Newton Rd	4	35.79499	-85.22268
Cambarus pristinus	10-Apr-06	Millsea Branch imm. upst. confl. Clifty Ck	0	35.8863	-85.25152
Cambarus pristinus	26-May-06	Mitchell Branch @ Cardinal Road	0	35.75314	-85.33454
Cambarus pristinus	11-Apr-06	Nails Creek off timber road	0	35.76171	-85.12499
Cambarus pristinus	8-Jun-05	Oldfield Branch @ Newton Rd	2	35.7814	-85.2282
Cambarus pristinus	1-Jun-06	Pineorchard Creek @ CC Road	0	35.62184	-85.29626
Cambarus pristinus	7-Jun-05	Piney Creek @ SR 284	0	35.62685	-85.43674
Cambarus pristinus	Historic	Piney Creek @ SR 284		35.62685	-85.43674
Cambarus pristinus	Historic	Pokepatch Creek		35.95004	-85.21286
Cambarus pristinus	19-Apr-05	Pokepatch Creek	3	35.95004	-85.21286
Cambarus pristinus	8-Jun-06	Polly Branch @ Centennial Wilderness	0	35.87004	-85.27923
Cambarus pristinus	14-Jun-06	Puncheoncamp Creek @ Punch. Ck Rd	20	35.83635	-85.22596
Cambarus pristinus	7-Jun-06	Raccoon Creek @ Brewer Road	0	35.78677	-85.14399
Cambarus pristinus	14-Jun-06	Raccoon Creek @ SR 101	2	35.7794	-85.15958
Cambarus pristinus	12-Apr-06	Rogers Creek @ Rogers Creek Road	0	35.86492	-85.22662
Cambarus pristinus	14-Jun-06	Second Creek @ confl Laurel Creek	0	35.85824	-85.15802
Cambarus pristinus	13-Jun-06	Simmons Creek @ Simmons Creek Road	0	35.77161	-85.29401
Cambarus pristinus	26-May-06	Spring Creek @ SR 285	4	35.77083	-85.28831

Cambarus pristinus	8-Jun-06	Tantrough Creek @ Old US 70	0	35.96359	-85.14021
Cambarus pristinus	12-Apr-06	Unn. Trib to Glade Creek	0	35.72915	-85.26403
Cambarus pristinus	6-Jun-06	Unn. Trib to Glade Creek	0	35.69373	-85.24996
Cambarus pristinus	1-Jun-06	Wallingmill Creek @ Myers Road	0	35.6884	-85.34412
Cambarus pristinus	15-Jun-06	West Fork @ Browntown Road	6	35.92438	-85.21353
Cambarus pristinus	8-Jun-05	West Fork @ Newton Rd	9	35.8005	-85.2076
Cambarus pristinus	14-Jun-06	West Fork @ Newton Rd	2	35.8005	-85.20751
Cambarus pristinus	10-Apr-06	West Fork Creek @ Taylors Chapel Rd	5	35.91801	-85.20023
Cambarus pristinus	Historic	White Oak Creek		35.96955	-85.2
Cambarus pristinus	19-Apr-05	White Oak Creek	4	35.96955	-85.2
Cambarus pristinus	Historic	Wilkerson Creek		35.99095	-85.23302
Cambarus williami	13-Apr-06	Brawley's Fork @ US 64	1	35.72755	-86.17361
Cambarus williami	20-Oct-05	E. Fork Stones River @ Hwy 64	0	35.81365	-86.15136
Cambarus williami	20-Oct-05	E. Fork Stones River @ Old U.S. 70	0	35.82937	-86.17851
Cambarus williami	20-Oct-05	E. Fork Stones River @ Old U.S. 70	4	35.81987	-86.13764
Cambarus williami	11-Aug-06	East Fork Stones River adj Stones Rvr Rd	45	35.84542	-85.96658
Cambarus williami	11-Aug-06	East Fork Stones River headwaters	0	35.84737	-85.95367
Cambarus williami	13-Apr-06	Locke Creek @ Locke Creek Road	4	35.86325	-86.11383
Cambarus williami	11-Aug-06	Northcutt Branch @ Northcutt Road	0	35.88775	-86.13391
Cambarus williami	13-Apr-06	Shelton Branch @ Dickens Hill Road	0	35.72589	-86.15857
Cambarus williami	13-Apr-06	Shelton Branch @ Perkins Road	0	35.72411	-86.15043
Cambarus williami	13-Apr-06	Shelton Branch @ US 64	0	35.73572	-86.16745
Cambarus williami	13-Apr-06	Shelton Branch d/s of Dickens Hill Road	0	35.72888	-86.16073
Cambarus williami	13-Apr-06	Shelton Branch d/s of Dickens Hill Road	0	35.72794	-86.15948
Cambarus williami	13-Apr-06	Tolbert Hollow Spring @ Gilley Hill Road	1	35.68466	-86.15442
Orconectes wrighti	26-Apr-06	Anderson Branch @ Sulfurwell Road	0	35.36879	-88.23471
Orconectes wrighti	21-Jun-06	Battles Branch @ Campbell Mill Road	0	35.03338	-88.29308
Orconectes wrighti	27-Jun-06	Beason Creek @ Seaton Loop	11	35.22481	-88.33858
Orconectes wrighti	11-Oct-05	Beason Creek @ SR69	2	35.22904	-88.32408
Orconectes wrighti	28-Jun-06	Brown Br. (Miss. R.) @ Albert Owens Rd	0	35.28966	-88.55879
Orconectes wrighti	28-Jun-06	Brown Branch @ Pratt Road	0	35.12464	-88.3902
Orconectes wrighti	27-Jun-06	Caney Branch @ Caney Branch Road	0	35.20293	-88.35736
Orconectes wrighti	26-Apr-06	Chalk Creek @ V.R. Small Road	0	35.29915	-88.26983
Orconectes wrighti	29-Jun-06	Clear Creek @ SR 117	5	35.17512	-88.389
Orconectes wrighti	28-Jun-06	Clear Creek @ SR 224	6	35.16879	-88.43303
Orconectes wrighti	28-Jun-06	Coon Creek @ Coon Creek Science Ctr	0	35.33351	-88.42599
Orconectes wrighti	28-Jun-06	Coon Creek @ Enville Road	0	35.36361	-88.4115
Orconectes wrighti	27-Jun-06	Dillon Branch @ Benny Road	7	35.13195	-88.37602
Orconectes wrighti	20-Jun-06	Dollar Creek @ N. Elm Street	0	35.24325	-88.38046
Orconectes wrighti	27-Jun-06	Dollar Creek @ Old Morris Chapel Road	8	35.24151	-88.35358
Orconectes wrighti	26-Apr-06	East Prong Doe @ Presley Ridge Road	0	35.43049	-88.23371
Orconectes wrighti	27-Jun-06	Gattis Creek @ Phillips Road	0	35.21307	-88.32322
Orconectes wrighti	12-Oct-05	Glover Br. @ Cavalry Road, Shiloh NMP	0	35.146	-88.34155
Orconectes wrighti	27-Apr-06	Glover Branch @ Shiloh NMP	0	35.15735	-88.34264

Orconectes wrighti	29-Jun-06	Graham Creek @ SR 117	2	35.19458	-88.39559
Orconectes wrighti	21-Jun-06	Hindman Branch @ Bark Hindman Road	0	35.08687	-88.3396
Orconectes wrighti	27-Apr-06	Hoover Branch @ Center Hill Road	0	35.02404	-88.32345
Orconectes wrighti	11-Oct-05	Hoover Branch @ confl Chambers Creek	1	35.02543	-88.30753
Orconectes wrighti	28-Jun-06	Houston Branch @ Old SR 57	0	35.03294	-88.24062
Orconectes wrighti	28-Jun-06	Howell Branch @ Pratt Road	5	35.12472	-88.37249
Orconectes wrighti	21-Jun-06	Leath Creek @ Hamburg Road	0	35.06026	-88.30394
Orconectes wrighti	28-Jun-06	Lick Creek (Snake) @ Winding Ridge Rd	0	35.29691	-88.43812
Orconectes wrighti	21-Jun-06	Lick Creek @ North Prather Road	0	35.072	-88.46602
Orconectes wrighti	26-Oct-05	Lick Creek @ SR 142	0	35.08974	-88.35267
Orconectes wrighti	26-Oct-05	Lick Creek @ SR 22	0	35.07283	-88.39011
Orconectes wrighti	29-Jun-06	Lick Creek @ SR 224	0	35.07505	-88.4294
Orconectes wrighti	22-Jun-06	Little Creek @ SR 22	0	35.08288	-88.38391
Orconectes wrighti	21-Jun-06	Little John Branch @ Center Hill Road	0	35.00083	-88.33717
Orconectes wrighti	21-Jun-06	Little Lick @ Tulu Road	0	35.04852	-88.40001
Orconectes wrighti	22-Jun-06	Little Owl @ SR 224	10	35.11665	-88.42604
Orconectes wrighti	29-Jun-06	McDaniel Branch @ SR 142	0	35.15864	-88.41971
Orconectes wrighti	29-Jun-06	Middle Fork Owl @ Albert Robinson Road	4	35.13928	-88.46462
Orconectes wrighti	22-Jun-06	Middle Fork Owl @ Albert Robinson Road	10	35.13928	-88.46458
Orconectes wrighti	27-Jun-06	Middleton Creek @ SR 100	0	35.49334	-88.38845
Orconectes wrighti	26-Apr-06	Miles Creek @ SR 69	0	35.3821	-88.22794
Orconectes wrighti	12-Oct-05	Miles Creek at Saltillo Road	0	35.37303	-88.22241
Orconectes wrighti	27-Apr-06	North Fork Beason @ Glendale Road	7	35.24787	-88.33124
Orconectes wrighti	26-Oct-05	North Fork Beason @ Glendale Road	28	35.24787	-88.33124
Orconectes wrighti	20-Jun-06	North Fork Beason @ Old Union Road	7	35.26144	-88.34866
Orconectes wrighti	Historic	North Fork Beason @ SR69		35.26478	-88.35342
Orconectes wrighti	27-Apr-06	Owl Creek @ Shiloh NMP Boundary	0	35.16954	-88.34457
Orconectes wrighti	12-Oct-05	Owl Creek @ SR 142, Hurley	3	35.14129	-88.3706
Orconectes wrighti	22-Jun-06	Owl Creek @ SR 224	12	35.12141	-88.42295
Orconectes wrighti	21-Jun-06	Pisgah Branch @ Pisgah Road	0	35.08008	-88.35424
Orconectes wrighti	Historic	Robinson Creek @ SR 57		35.04829	-88.25166
Orconectes wrighti	25-Oct-05	Robinson Creek @ SR 57	6	35.04829	-88.25166
Orconectes wrighti	21-Jun-06	Robinson Creek @ May Hall Road	5	35.04111	-88.25905
Orconectes wrighti	12-Oct-05	Shiloh Branch @ Shiloh NMP	0	35.13088	-88.35359
Orconectes wrighti	29-Jun-06	Smith Fork @ US 64	0	35.25594	-88.07389
Orconectes wrighti	12-Oct-05	Snake Creek @ Sam Kirby Road	0	35.26456	-88.47329
Orconectes wrighti	Historic	Snake Creek @ SR22		35.17997	-88.32628
Orconectes wrighti	Historic	South Fork Beason Creek @ SR69		35.23147	-88.32442
Orconectes wrighti	11-Oct-05	South Fork Beason Creek @ SR69	7	35.23147	-88.32442
Orconectes wrighti	26-Oct-05	South Fork Mud Creek @ SR 69	0	35.29931	-88.35647
Orconectes wrighti	27-Apr-06	Spain Branch @ Federal Road	0	35.11871	-88.31866
Orconectes wrighti	26-Apr-06	Stewman Creek @ SR 202	0	35.41882	-88.15872
Orconectes wrighti	20-Jun-06	Stewman Creek @ SR 202 (revisit)	0	35.41882	-88.15872
Orconectes wrighti	22-Jun-06	Stratton Branch @ Old Morris Chapel Rd	3	35.24494	-88.35298

Orconectes wrighti	25-Oct-05	Sulphur Creek @ Pickwick Landing SP	0	35.05105	-88.23852
Orconectes wrighti	25-Oct-05	Sulphur Creek @ Pickwick Landing SP	0	35.04862	-88.23676
Orconectes wrighti	29-Jun-06	Sulphur Spring Branch @ Beauty Hill Rd	0	35.2898	-88.50433
Orconectes wrighti	20-Jun-06	Turnbo Creek @ SR 69	0	35.44119	-88.09949
Orconectes wrighti	20-Jun-06	unn. trib to Beason Creek @ Box Elder Rd	2	35.26427	-88.32091
Orconectes wrighti	20-Jun-06	unn. trib to Beason Creek @ Harris Road	4	35.26157	-88.33478
Orconectes wrighti	22-Jun-06	Walker Branch SNA @ Pittsburg Road	0	35.17438	-88.26491
Orconectes wrighti	27-Jun-06	Wicker Branch @ Seay Road	0	35.21114	-88.33968
Orconectes wrighti	28-Jun-06	Winningham Branch @ Pratt Road	2	35.12495	-88.37914
Orconectes wrighti	21-Jun-06	Woods Branch @ Center Hill Road	0	35.01576	-88.32706

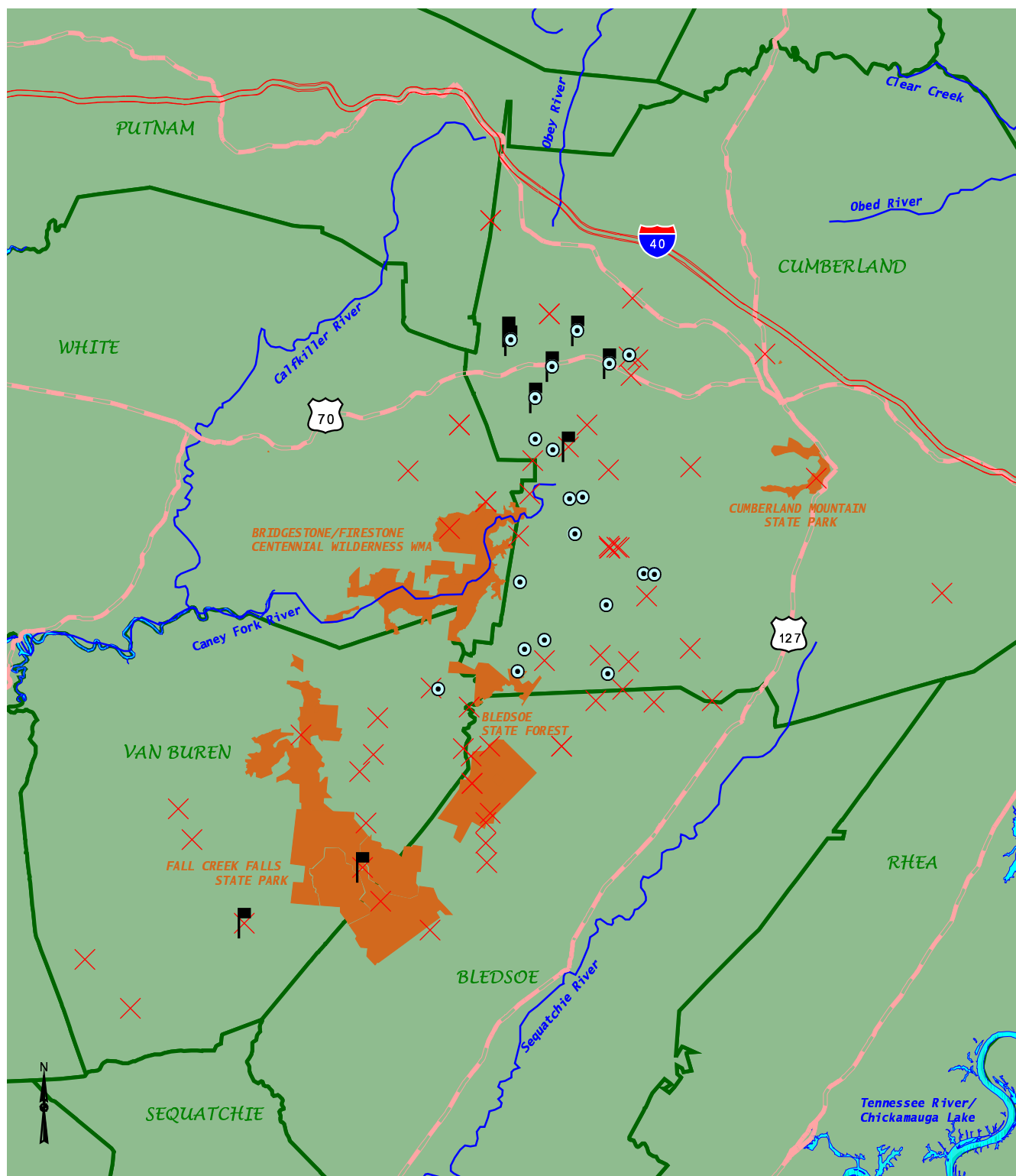


Figure 1. Known Range of *Cambarus pristinus*

5 0 5 10 Miles

- New Record, 2004-2006
- Historic Occurrence
- × Surveyed but not Found

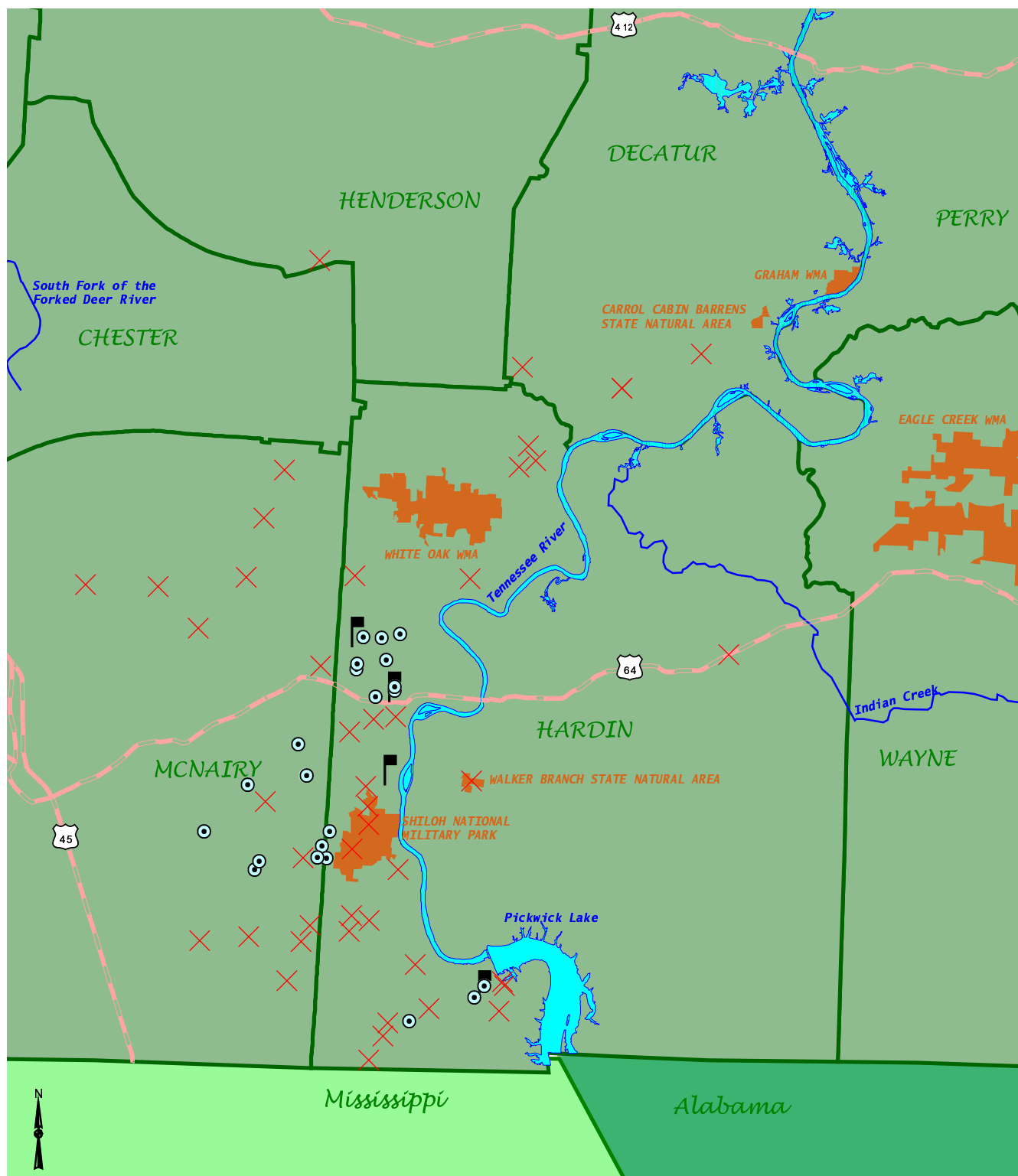


Figure 2. Known Tennessee Range of *Orconectes wrighti*

5 0 5 10 Miles

- New Record, 2004-2006
- Historic Occurrence
- × Surveyed but not Found

Appendix 1: Biotics Database Records

EO ID:	12809	EO_NUM	1	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name
WHITE OAK CREEK

Directions "Tributary of White Oak Creek, 3.9 mi E of White-Cumberland Co. line." Plotted along US 70S.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355817N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851156W

<u>Watershed</u> 05130108 - Caney	<u>Physiographic Province</u> CU
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Survey Information

<u>Surveyors</u>	Horton Hobbs, Jr.
<u>Surveyors</u>	Chris Taylor

Survey Date	1995-07-26
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First Observation Date	1962-04-19	Last Observation Date	1995-07-26
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EO Data 1995: INHS 5148, 4 specimens collected (2 males/2 females coll. by C.A. Taylor and J.C. Porterfield); 1962: Fitzpatrick and Hobbs coll. 8 Form I males, 7 females, and 3 ovigerous females (NMNH #115528, 115555).

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank
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EO Rank Comment

Description

General Description "The specimens were collected from under small, flat pieces if [sic] rock in very shallow water (less than 0.3 m). Stream width at collection site was about 3 m and current was very slow." (Chris Taylor 3/17/2000 e-mail to Roger McCoy)

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen
Taylor, C.A. and J.C. Porterfield. INHS #5148
Fitzpatrick & Hobbs. NMNH #115528 (holotype), #115555 (paratype)

EO ID:	14883	EO_NUM	2	Scientific Name	Cambarus pristinus	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name
Wilkerson Creek (lower)

Directions Wilkerson Creek at Mayland Road bridge crossing, just N of Pleasant Hill and ca 9.5 air miles WNW Crossville.

Locators

County		Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355859N	
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851128W	
<u>Watershed</u>	<u>Physiographic Province</u>				
05130108 - Caney	CU				

Survey Information

<u>Surveyors</u>	Carl E. Williams
<u>Surveyors</u>	Rick D. Bivens
<u>Surveyors</u>	Bart D. Carter

Survey Date	2004-12-16		
First Observation Date	2004-12-16	Last Observation Date	2004-12-16

EO Data One Form I male, one adult female, and one juv. male C. pristinus coll. by TWRA Region 4 Stream Survey Crew during 3 man-hour crayfish survey of all habitat types at the bridge crossing. Also coll.: Cambarus parvovulus (4 Form I males, 5 adult females, 3 juv. males, 1 juv. female) and C. sphenoides (1 juv. female).

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank	
EO Rank Comment			

Description

General Description Stream condition: Temp- 4 degrees C, pH- 6.2, Conductivity- 15 micromhos/cm, Avg. stream width- 8 meters, Stream flow- 27.2 cfs.

MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
TWRA Field Coll. # CEW 121604-36

EO ID:	14884	EO_NUM	3	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B - Good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Maple Branch

Directions Maple Branch just upstream of Glade Creek Road bridge crossing, WNW of Pleasant Hill and ca 11.8 air miles W of Crossville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355907N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851354W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	Carl E. Williams
<u>Surveyors</u>	Rick D. Bivens
<u>Surveyors</u>	Bart D. Carter
<u>Surveyors</u>	David Withers and Glenn Rohrbach

Survey Date 2006-06-15

First Observation Date 2004-12-16	Last Observation Date 2006-06-15
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EO Data 2006-06-15: One adult Form II male and 2 adult female Cambarus pristinus with YOY attached were quickly coll. by Withers and Rohrbach in 0.5 man-hours. One juv. C. sphenoides also observed. No vouchers taken. 2004-12-16: Three Form I male and two adult female C. pristinus coll. by TWRA Region 4 Stream Survey Crew during 1.5 man-hour crayfish survey of all habitat types just upstream of bridge crossing. Also coll.: Cambarus parvovulus (4 Form I males, 2 Form II males, 15 females, 2 juv. males) and C. sphenoides (1 female, 3 juveniles).

EO Rank

Basic EO Rank	B - Good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description "Here the stream was small and relatively shallow, large flat rocks were abundant, and crayfish specimens were easily collected" (Williams et al., 2004). Avg. stream width- 3.5 meters.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

TWRA Field Coll. # CEW 121604-37

EO ID:	14912	EO_NUM	4	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Whiteoak Creek

Directions Whiteoak Creek imm. upstream of culvert crossing on Browntown Road, just S of Hwy 70 near Pleasant Hill, ca 9.8 air miles W of Crossville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355810N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851201W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

<u>Surveyors</u>	Chris E. Skelton
<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers
<u>Surveyors</u>	Carl Williams
<u>Surveyors</u>	Rick Bivens
<u>Surveyors</u>	Bart Carter

Survey Date 2005-04-19

First Observation Date 1996-12-06	Last Observation Date 2005-04-19
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EO Data 2005-04-19: McCoy & Withers coll. & released one adult male (Form I), 1 adult female in berry, and two juv. female C. pristinus during approx. 2.5 man-hour survey of creek from bridge upstream approx. 100 m (to upstream side of powerline ROW); also obs. C. parvocus, C. sphenoides, and several juv. Cambarus sp.; 2004-12-16: One Form I male, two adult female, and one juv female C. pristinus coll. by TWRA Region 4 Stream Survey Crew during 3.0 man-hour crayfish survey of all habitat types just upstream of culvert crossing. Also coll.: Cambarus parvocus (2 Form I males, 1 Form II male, 15 adult females, 4 juv males, 9 juv females) and C. sphenoides (1 adult female, 4 juv females); 1996-12-06: Williams, Bivens, & Skelton coll. 6 Form I male and 5 adult female C. pristinus (TWRA 1-300).

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description 19 April 2005: Perennial stream avg ca 3.5 m wide and 15 cm deep, cool (60's F), with slab rock on bedrock or sand, minimal sediment, but with some erosion at ATV trail by powerline ROW.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

2004: Field Coll. #CEW 121604-40; 1996: TWRA #1-300.

EO ID:	14916	EO_NUM	5	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	C? - Possibly fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Caney Fork River at US Hwy 70S

Directions Caney Fork River at US 70S, approx. 6.5 miles E of White-Cumberland County line, E of Pleasant Hill.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355813N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0850918W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

<u>Surveyors</u>	Carl Williams
<u>Surveyors</u>	Rick Bivens
<u>Surveyors</u>	Chris Skelton
<u>Surveyors</u>	P.C. Holt
<u>Surveyors</u>	Horton Hobbs, Jr.
<u>Surveyors</u>	R.W. Bouchard
<u>Surveyors</u>	C. Comiskey
<u>Surveyors</u>	J.D. Way
<u>Surveyors</u>	J.F. Fitzpatrick
<u>Surveyors</u>	David Withers and Glenn Rohrbach

Survey Date 2006-06-15

First Observation Date	1961-07-22	Last Observation Date	2006-06-15
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EO Data 2006-06-15: Rohrbach and Withers coll. 1 adult female *Cambarus pristinus* from a 50 m segment (10 m upst. bridge and 40 m dnst. bridge). Also observed 3 female *C. sphenoides* with YOY attached. No voucher specimen taken. 1996-12-06: Williams, Bivens, & Skelton coll. 2 adult female *C. pristinus* (TWRA #1-303); 1971-10-09: Bouchard & Way coll. 22 Form I males, 40 females, 1 juv. male, and 1 juv. female (NMNH #217652); 1969-04-22: Hobbs coll. 1 Form I male, 2 juv. males, and 2 ovigerous females (NMNH #130608); 1968-08-13: Bouchard and Comiskey coll. 9 Form I males, 8 females, 3 juv. males, and 3 juv. females (NMNH #217647); 1968-08-04: Bouchard coll. 1 female (NMNH #217648); 1962-04-19: Fitzpatrick & Hobbs coll. 1 Form I male, 1 juv. male, 1 juv. female, and 3 ovigerous females (NMNH #115556); 1961-07-22: 3 females and 3 Form II males coll. by Holt (NMNH #115529-30, 115557).

EO Rank

Basic EO Rank	C? - Possibly fair estimated viability	Origin Subrank	
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EO Rank Comment

Description

General Description 2006-06-15: Slab and rock on deep sands; steep banks and deep water dnst bridge; rock on sand and more shallow water near bridge; high sediment, but clears mod. quickly. Large perennial stream.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

EO ID:	14917	EO_NUM	6	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Pokepatch Creek

Directions Pokepatch Creek at County Road 4385 (Browntown Road).

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355700N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851248W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	David ian Withers
<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	R.W. Bouchard

Survey Date 2005-04-19

First Observation Date	1969-07-08	Last Observation Date	2005-04-19
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EO Data 2005-04-19: Withers & McCoy coll./rel. 2 juv. male *C. pristinus*, 1 adult female *C. pristinus* in berry, and one probable male and one probable female, from approx. 100 m segment containing 50 m segment on either side of Browntown Road bridge; also obs. several probable *C. parvoculus*, including 3 females in berry and at least one Form I male (2.5 man-hour survey); 1969-07-08: Ray Bouchard coll. 4 female and 2 juv. male *Cambarus pristinus* from Pokepatch Creek (NMNH #217649).

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Perennial tributary to Caney Fork River with plentiful slab rocks.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

NMNH #217649

EO ID:	14918	EO_NUM	7	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	F - Failed to find	Precision_BCD	M
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Site/Directions

Survey Site Name

Caney Fork River @ Taylors Chapel Road

Directions Caney Fork River @ Taylors Chapel Road, approx. 2.2 air miles NE of Clifty.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355511N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851116W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

J.W. Parsons

Surveyors

David Withers, Todd Crabtree, Mark Thurman

Survey Date 2006-06-08

First Observation Date	1951-08-04	Last Observation Date	2006-06-08
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EO Data 2006-06-08: In an approx. 40 m segment dnst of bridge, Withers, Crabtree, and Thurman obs. only a few ad. and juv. Cambarus spheonoides. Cambarus pristinus was not collected during this survey. Corbicula and ramshorns present, but aquatic bugs were minimal; 1951-08-04: Parsons coll. 1 female Cambarus pristinus from this location (NMNH #115558).

EO Rank

Basic EO Rank	F - Failed to find	Origin Subrank
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EO Rank Comment

Description

General Description Large perennial stream. Moderately swift and clear water; substrate mostly bedrock with pockets of rock and slab on bedrock or sand; sections of littoral zone with good slab on sand; impacted by ORV use in creek; edges of creek shaded, ~20-30% canopy; Readings at bridge: DO 11.8 mg/L, pH 7.63, 51.6 uS, 21.8 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

NMNH #115558

EO ID:	14919	EO_NUM	8	Scientific Name	Cambarus pristinus	8/30/2006	EOCODE_BCD:	ICMAL07690
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B? - Possibly good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Caney Fork River @ Bud Tanner Rd.

Directions Caney Fork River at Bud Tanner Road between US Hwy 70S and 70N, approx. 1.2 miles NE Pleasant Hill.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355928N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851051W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	R. W. Bouchard
<u>Surveyors</u>	J. D. Way
<u>Surveyors</u>	David Ian Withers
<u>Surveyors</u>	Kirstin Condict

Survey Date	2006-06-02		
First Observation Date	1971-10-09	Last Observation Date	2006-06-02

EO Data 2006-06-02: Condict and Withers observed 1 adult male (II) and 1 adult female Cambarus pristinus. Also observed 1 adult male (II) C. sphenoides and 2 adult C. parvovulus (1 female "in berry" and 1 male [II]). 1971-10-09: Bouchard and Way coll. 4 Form I male Cambarus pristinus (NMNH #217653).

EO Rank

Basic EO Rank	B? - Possibly good estimated viability	Origin Subrank	
EO Rank Comment	Brief survey by two staff members.		

Description

General Description Large perennial stream.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
NMNH #217653; though no date shown on record (#217653), the same two collectors coll. #217652 on 9 Oct 1971 in same area.

EO ID:	14920	EO_NUM	9	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	F - Failed to find	Precision_BCD	S
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Site/Directions

Survey Site Name

Cane Creek

Directions Cane Creek, upstream from confluence with Rockhouse Creek, Fall Creek Falls State Park. Mapped at first Park road crossing upstream from Rockhouse Creek.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	353939N
Van Buren (TN)	35085-F3	Sampson	<u>Longitude</u>	0852050W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	R.W. Bouchard
<u>Surveyors</u>	McCoy & Withers

Survey Date 2005-06-07

First Observation Date	1969-07-09	Last Observation Date	1969-07-09
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EO Data 2005-06-07: McCoy & Withers observed 2 juv C. parvovulus and no C. pristinus; 1969-07-09: Bouchard coll. 1 female Cambarus pristinus from this location (NMNH #217650).

EO Rank

Basic EO Rank	F - Failed to find	Origin Subrank	
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EO Rank Comment

Description

General Description Stream ~10 m wide and swift, with rock and slabrock on bedrock, 30-120 cm deep. Many areas with piles of slabrock so deep that crayfish if present could easily escape. Temp 21.2 C, pH 7.36, Cond 43 uS.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
383	FALL CREEK FALLS STATE PARK	SSPPK	

Documentation

Specimen

NMNH #217650

EO ID:	14921	EO_NUM	10	Scientific Name	Cambarus pristinus	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish			
State Status	E	Global Rank	G1	
Fed. Status		Subnational Rank	S1	

Identifiers

Basic EO Rank	F - Failed to find	Precision_BCD	S
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Site/Directions

Survey Site Name
Piney Creek @ SR284

Directions "Piney Creek off TN Hwy 111 to Fall Creek Falls State Park." Mapped at Piney Creek crossing of Hwy 284.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		353738N
Van Buren (TN)	35085-F4	Spencer	<u>Longitude</u>		0852612W

<u>Watershed</u> 05130108 - Caney	<u>Physiographic Province</u> CU
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Survey Information

<u>Surveyors</u>	R.W. Bouchard
<u>Surveyors</u>	McCoy & Withers

Survey Date	2005-06-07
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First Observation Date	1969-07-09	Last Observation Date	1969-07-09
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EO Data 2005-06-07: From ~50 m d/s to 10 m u/s bridge, McCoy and Withers obs. numerous Cambarus parvovulus and C. sphenoides, including C. parvovulus in berry, but no C. pristinus. 1969-07-09: Bouchard coll. 2 Form II males and 1 juv. male Cambarus pristinus (NMNH #217651).

EO Rank

Basic EO Rank	F - Failed to find	Origin Subrank
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EO Rank Comment

Description

General Description Stream 4-5 m wide, but ~8 m wide at bridge, where becomes deep with ~50 cm thick sediments. In natural channel is rock and slabrock on cobble and sand, with riffles and glides. Depth 15-30 cm, becoming deeper under bridge, and to 1 m deep upstream. Temp 19.3 C, pH 6.31, Cond 192.2 uS. Much sediment upstream and under bridge.

MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
NMNH #217651

EO ID:	14922	EO_NUM	11	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary			
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Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers			
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Basic EO Rank	H - Historical	Precision_BCD	S
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Site/Directions			
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<u>Survey Site Name</u>	Big Brush Creek
Directions	Big Brush Creek, approx. 0.2 km downstream from confluence with Blair Creek. This coincides with trail crossing to Jordan Rock House.

Locators			
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County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	353104N
Bledsoe (TN)	35085-E4	Smartt Mountain	<u>Longitude</u>	0852426W

<u>Watershed</u>	<u>Physiographic Province</u>
06020004 - Sequatchie	CU

Survey Information			
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<u>Surveyors</u>	Gilbert
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Survey Date	1975-04-30
First Observation Date	1975-04-30
Last Observation Date	1975-04-30
EO Data	One Form I male <i>Cambarus pristinus</i> coll. by Gilbert and identified by Bouchard (NMNH #206274). This is regarded as the "Sequatchie" form as recognized by the TWRA, and may represent a new species.

EO Rank			
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Basic EO Rank	H - Historical	Origin Subrank	
EO Rank Comment	Note this may represent an undescribed species with a striking similarity to <i>C. pristinus</i> .		

Description			
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General Description	Perennial stream.
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MA/Ownership			
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Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation			
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<u>Specimen</u>	NMNH #206274
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EO ID:	14927	EO_NUM	12	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name

Bird Fork

Directions Bird Fork, approx. 0.4 mile upstream of confluence with Long Fork, approx. 7.7 air miles NNW of Dunlap.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	352944N
Sequatchie (TN)	35085-D4	Savage Point	<u>Longitude</u>	0852543W

Watershed

06020004 - Sequatchie

Physiographic Province

CU

Survey Information

Surveyors

Chris Skelton

Surveyors

C.J. Paxton

Survey Date 1996-07-04

First Observation Date 1996-07-04	Last Observation Date 1996-07-04
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EO Data Skelton and Paxton coll. 2 Form II male C. pristinus (typed by Carl Williams, TWRA). This is regarded as the "Sequatchie" form as recognized by the TWRA, and may represent a new species.

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank
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EO Rank Comment Note this may represent an undescribed species with a striking similarity to C. pristinus.

Description

General Description Perennial stream.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

TWRA #1-325, 2 Form II males

EO ID:	14928	EO_NUM	13	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name

Long Fork

Directions Long Fork upstream of confluence with Big Brush Creek. Plotted at trail crossing.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	353005N
Sequatchie (TN)	35085-E4	Smartt Mountain	<u>Longitude</u>	0852431W

Watershed

06020004 - Sequatchie

Physiographic Province

CU

Survey Information

Surveyors

Dan Murray

Surveyors

C.J. Paxton

Survey Date 1998-09-09

First Observation Date	1998-09-09	Last Observation Date	1998-09-09
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EO Data Murray coll. 1 Form I male *C. pristinus* (typed by Murray and Carl Williams, TWRA). This is regarded as the "Sequatchie" form as recognized by the TWRA, and may represent a new species.

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank
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EO Rank Comment Note this may represent an undescribed species with a striking similarity to *C. pristinus*.

Description

General Description Perennial stream.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

TWRA #1-363, 1 Form I male

EO ID:	14929	EO_NUM	14	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name	Glady Fork
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Directions	Glady Fork, both upstream and downstream of Hwy 111 crossing.
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Locators

County	Mapsheets			
County Name	Mapsheet Code	Mapsheet Name	Latitude	353133N
Sequatchie (TN)	35085-E4	Smartt Mountain	Longitude	0852809W
Watershed	Physiographic Province			
05130108 - Caney	CU			

Survey Information

Surveyors	Chris Skelton
Surveyors	C.J. Paxton
Surveyors	Carl Williams
Surveyors	Rick Bivens

Survey Date	1996-12-06
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First Observation Date	1996-10-18	Last Observation Date	1996-12-06
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EO Data	1996-12-06: Williams, Bivens, & Skelton coll. 8 Form I male, 8 Form II male, and 9 female C. pristinus; 1996-10-18: Skelton & Paxton coll. 1 Form I male C. pristinus (typed by Carl Williams, TWRA). This is regarded as the "Sequatchie" form as recognized by the TWRA, and may represent a new species.
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EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank	
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EO Rank Comment	Note this may represent an undescribed species with a striking similarity to C. pristinus.
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Description

General Description	Perennial stream.
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MA/Ownership

Managed Area			
MA ID	Name	Type	Contained

Documentation

Specimen	
	TWRA #1-327, 1 Form I male
	TWRA #1-296, 8 Form I males, 8 Form II males, 9 females

EO ID:	14930	EO_NUM	15	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name

Flatrock Branch

Directions Flatrock Branch at logging road crossing, ca 12.8 air miles SW Pikeville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	353039N
Bledsoe (TN)	35085-E4	Smartt Mountain	<u>Longitude</u>	0852304W

Watershed

06020004 - Sequatchie

Physiographic Province

CU

Survey Information

Surveyors

Chris Skelton

Surveyors

C. Jones

Survey Date 1996-07-17

First Observation Date 1996-07-17	Last Observation Date 1996-07-17
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EO Data 1996-07-17: Skelton & Jones coll. 1 Form II male C. pristinus (typed by Carl Williams, TWRA). This is regarded as the "Sequatchie" form as recognized by the TWRA, and may represent a new species.

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank
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EO Rank Comment Note this may represent an undescribed species with a striking similarity to C. pristinus.

Description

General Description Perennial stream.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

TWRA #1-322, 1 Form II male

EO ID:	15002	EO_NUM	16	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Meadow Creek at Lowe Road

Directions Meadow Creek at Lowe Road, ca 0.5 mile E of Erasmus and ca 9.4 miles SW Crossville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355317N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851039W

<u>Watershed</u> 05130108 - Caney	<u>Physiographic Province</u> CU
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Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date	2005-04-20
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First Observation Date	2005-04-20	Last Observation Date	2005-04-20
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EO Data In ca 2.5 man-hours, McCoy & Withers obs. 1 adult male (I) and 2 adult females (both in berry) in Meadow Creek from Lowe Road bridge upstream ca 100 m. The Form I male was collected as a specimen for TWRA crayfish collection, and the females were released at point of capture (photos taken of all 3). Also obs. 1 adult male (I) and 1 adult female Cambarus (prob. C. parvocolus). Few crayfish of any kind were observed, and no YOY or juveniles. Crayfish were obs. or coll. from under slab rocks only in deep water in center of channel. Few aquatic insect larvae were noted. C. pristinus specimens ca 3.5-4" TL.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Meadow Creek was cool (est. 60's F) and fast (ca 10 cfs) with a substrate of slab rock on bedrock, with interspersed small rocks, cobble, and sand. Avg. ca 7 m wide and ca 0.3-0.6 m deep. No canopy cover; adj. property clearcut recently (< 5 yr).

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen
One Form I male C. pristinus coll.; will be accessed by TWRA reference crayfish collection.

EO ID:	15003	EO_NUM	17	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	C - Fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Laurel Creek, Erasmus

Directions Laurel Creek at Old Ross Road, Erasmus, ca 10 miles SW Crossville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355315N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851118W

<u>Watershed</u> 05130108 - Caney	<u>Physiographic Province</u> CU
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Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date	2005-04-20
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First Observation Date	2005-04-20	Last Observation Date	2005-04-20
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EO Data In ca 2.0 man-hours, McCoy & Withers obs. only one C. pristinus, a melanic adult male (I), in segment from Old Ross Road bridge upstream ca 100 m. The specimen was photographed and released at point of capture. No other crayfish of any species were observed. The survey was largely restricted to near-shore areas due to beaver impoundment. C. pristinus male ca 4" TL.

EO Rank

Basic EO Rank	C - Fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Laurel Creek was cool (est. 60's F) and somewhat sluggish, with a substrate of slab rock or cobble on bedrock or sand. Avg. ca 15 m wide and ca 1-1.3 m deep. Canopy cover < 10% but with forested banks. Moderate siltation present.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15016	EO_NUM	18	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	B - Good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Jumping Branch @ Flat Rock Road

Directions Jumping Branch imm. downstream of Flat Rock Road, 1.5 miles due S of Erasmus.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355158N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0851060W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date 2005-06-08

First Observation Date	2005-06-08	Last Observation Date	2005-06-08
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EO Data In approx. 20 m segment beginning approx. 20 m downstream of bridge, McCoy & Withers obs. several *Cambarus pristinus* (2 adult males, 1 adult female in berry, 4 juv. males, and 3 juv. females). One adult male *C. pristinus* was collected as a reference specimen. Also obs. several *C. parvovulus* and one juv. male *C. sphenoides*.

EO Rank

Basic EO Rank	B - Good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description In approx. 20 m section of Jumping Branch: stream approx. 3 m wide, 10-15 cm deep, with little sediment. Substrate rock & slabrock on bedrock, incl. sections with deep rock piles, runs with some slabrock cover, sand, and cobble. Approx. 80% canopy cover. Temp 17.3 C / pH 7.17 / Cond 34.7 uS.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15017	EO_NUM	19	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AB - Excellent or good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

West Fork (Little Cane Creek) @ intersection of Newton Rd and Los

Directions West Fork of Little Cane Creek @ intersection of Newton Rd and Loshbough Rd, approx. 0.5 air mile NE of intersection of Newton Rd and Newton-Winesap Rd.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354801N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0851227W
 <u>Watershed</u>	 <u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date 2006-06-14

First Observation Date 2005-06-08	Last Observation Date 2006-06-14
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EO Data 2006-06-14: In a pool just downstream of culvert, Rohrbach & Withers obs. 2 Cambarus pristinus, one adult male Form II and one adult female. Several C. parvovulus were observed, along with numerous pleurocerid snails. No voucher specimen collected; 2005-06-08: In approx. 30 m segment from 10 m dnst Newton Rd to 20 m upst, McCoy & Withers obs. 9 Cambarus pristinus. This included 8 juv or young ad (5 male, 3 female) approx. 5.0-6.4 cm TL, and one adult female with attached young. One male and one female juv were coll. as reference specimens, along with a molt from a male C. pristinus. Also obs. abundance of pleurocerid snails (cf Elimia sp.), and several C. parvovulus.

EO Rank

Basic EO Rank	AB - Excellent or good estimated viability	Origin Subrank
EO Rank Comment	Of all sites visited 7-8 June 2005, Cambarus pristinus was most abundant at this location. McCoy netted a specimen with first sweep upstream of bridge.	

Description

General Description In this 30 m section of West Fork: stream approx. 3-4 m wide, from approx. 20 cm to 0.9 m deep, flow < 1 cfs; substrate rock & slabrock over sand and silt; silt load moderate and water was easily clouded; canopy approx. 30%; Temp 17.8 C / pH 6.98 / Cond 43.0 uS. A small dam is constructed imm. downstream of the sample area, and this section is apparently used as a full-immersion baptismal by a local congregation (marker indicates "Moore Baptising Hole").

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15018	EO_NUM	20	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Miller Branch @ Newton Rd

Directions Miller Branch @ Newton Rd, 0.6 air mile W of intersection of Newton Rd and Newton-Winesap Rd.

Locators

County	Mapsheets				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		354743N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>		0851324W

<u>Watershed</u> 05130108 - Caney	<u>Physiographic Province</u> CU
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Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date	2005-06-08
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First Observation Date	2005-06-08	Last Observation Date	2005-06-08
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EO Data In approx. 50 m segment imm. upstream of confl. of Miller Branch with a small tributary adj. Newton Rd, McCoy & Withers obs. 4 Cambarus pristinus (1 ad female in berry, approx. 6.4 cm TL; 1 male approx. 3.8 cm TL; 2 juv approx. 2.5 cm TL). One male C. pristinus was coll. as reference specimen. Also obs. numerous C. parvovulus and C. sphenoides.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description In this section of Miller Branch: stream approx. 2 m wide, 10-15 cm deep (some pools to 30 cm), flow 2-3 cfs (had just stormed prior to survey); substrate rock and slab on sand; surveyed segment slightly muddy from rain, but @ bridge a storm conveyance and tributary were contributing much silty runoff to the stream, beyond which point the stream was very muddy; approx. 95% canopy; Temp 17.5 C / pH 6.40 / Cond 19.1 uS.

MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen

EO ID:	15019	EO_NUM	21	Scientific Name	<i>Cambarus pristinus</i>	EOCODE_BCD:	8/30/2006 ICMAL07690
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Oldfield Branch @ Newton Rd, Bledsoe State Forest

Directions Oldfield Branch @ Newton Rd, Bledsoe State Forest, 1.3 miles SW of intersection of Newton Rd and Newton-Winesap Rd.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354653N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0851344W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130108 - Caney	CU			

Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers

Survey Date	2005-06-08		
First Observation Date	2005-06-08	Last Observation Date	2005-06-08

EO Data In approx. 50 m segment imm. upstream of bridge, McCoy & Withers obs. 2 *Cambarus pristinus* (1 adult female in berry, 1 juv female). Also obs. numerous *C. parvovulus* and *C. sphenoides*.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
EO Rank Comment		

Description

General Description In this section of Oldfield Branch: stream 3-5 m wide, relatively shallow, flow 1-2 cfs and clear in survey area despite recent thunderstorm; substrate rock and slab on sand and cobble, with deep rock and cobble in many places (good opportunities for crayfish to hide); also some pools with slabrock and sand; Temp 16.4 C / pH 6.31 / Cond 21.9 uS; note that some light sediment was found in sand in the upstream sample site, downstream of the bridge the creek was very cloudy from road runoff; nearly 100% canopy cover.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
40	BLEDSON STATE FOREST	SAGFO	

Documentation

Specimen

EO ID:	15218	EO_NUM	23	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B - Good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
West Fork Creek @ Taylors Chapel Road

Directions West Fork Creek @ Taylors Chapel Road, approx. 1.58 miles NE of Clifty.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355505N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851160W

<u>Watershed</u>	<u>Physiographic Province</u>
05130108 - Caney	CU

Survey Information

<u>Surveyors</u>	Kee Condict
<u>Surveyors</u>	David Ian Withers

Survey Date	2006-04-10
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First Observation Date	2006-04-10	Last Observation Date	2006-04-10
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EO Data 2006-04-10: In an approx. 80 m segment (30 m dnst to 50 m upst bridge) Condict and Withers coll. 5 adult Cambarus pristinus (2 females in berry, 3 Form I males). One of these males was collected as a voucher specimen. Also obs. several adult and juv C. parvovulus and C. sphenoides. All C. pristinus were found under slabrock on sand or cobble. Numerous ramshorn snails obs. Recent beaver activity in system.

EO Rank

Basic EO Rank	B - Good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Substrate dominated by sand and leaf litter, with some gravel, cobble, and silt, and some slabrock in places. Readings: Temp 11.5 C, pH 6.65, Cond 26.7 uS, DO 9.7 mg/l. Est flow 10+ cfs, avg width 7 m, depth 76 cm in center with deeper pools.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen
One adult male Form I collected by DNH

Summary							
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Common Name	A Crayfish			Global Rank	G1		
State Status	E			Subnational Rank	S1		
Fed. Status							

Identifiers							
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Basic EO Rank	C - Fair estimated viability			Precision_BCD	S		
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Site/Directions							
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Survey Site Name
Simmons & Spring creeks @ SR 285

Directions Confluence of Simmons & Spring creeks @ SR 285, approx. 0.4 mile SE of Lonewood community.

Locators							
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County	Mapsheet						
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354614N			
Van Buren (TN)	35085-G3	Lonewood	<u>Longitude</u>	0851718W			

<u>Watershed</u>	<u>Physiographic Province</u>
05130108 - Caney	CU

Survey Information							
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<u>Surveyors</u>	Laura Franklin, TSP						
<u>Surveyors</u>	David Ian Withers, DNH						

Survey Date	2006-06-13						
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First Observation Date	2006-05-26	Last Observation Date	2006-06-13				
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EO Data 2006-06-13: Rohrbach & Withers noted strong odor of cow dung in Simmons Creek ~ 0.1 mile upstream of SR285, and only obs. a few *Cambarus parvovulus* (one in berry) and *C. sphenoides*. From Spring Creek in lower 0.1 mile Rohrbach and Withers obs. 2 juv. *C. pristinus* (1 female, 1 male II) in brief survey; 2006-05-26: From the confluence of Spring and Simmons creeks and a short distance upstream & downstream of confluence, Franklin & Withers observed 4 juvenile/YOY *Cambarus pristinus*, including 2 males (II) and 2 females (both streams were sampled upstream of the confluence as well). Also observed several *C. parvovulus* of all ages (all males were Form II). No *C. sphenoides* were observed.

EO Rank							
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Basic EO Rank	C - Fair estimated viability			Origin Subrank			
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EO Rank Comment	2006-05-26: Only 4 juv/YOY observed in approx. 6 man-hours. No adults observed. Numerous specimens of sympatric <i>Cambarus parvovulus</i> .						
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Description							
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General Description 2006-05-26: Stream width variable, 1-4 m wide, 5-100+ cm deep, substrate deep rock and slabrock on bedrock, with many rocks embedded in sediment. Significant algae @ bridge, with sand & fine silt on rocks and interstices throughout. Many inaccessible hiding places for crayfish. Readings @ confluence: pH 6.77, D.O. 7.1 mg/l, Temp 17.8 C, Cond 54.2 uS; 2006-06-13: Simmons Creek contained much sediment in first 0.1 mile upstream of confluence. Spring Creek in first 0.1 mile upstream of confluence slab on sand, ~10 cm deep, rocks dominant, with some cobble.

MA/Ownership							
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Managed Area							
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>				

Documentation							
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Specimen
Four YOY/juv *C. pristinus* vouchered on 2006-05-26.

EO ID:	15322	EO_NUM	25	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Henderson Branch @ Spring Gap Road

Directions Henderson Branch @ Spring Gap Road, approx. 0.32 miles SSE of Zion Hill Church.

Locators

County	Mapsheets				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		354920N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>		0850939W
<u>Watershed</u>	<u>Physiographic Province</u>				
05130108 - Caney	CU				

Survey Information

<u>Surveyors</u>	David Withers, Todd Crabtree, Laura Franklin
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Survey Date	2006-06-07
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First Observation Date	2006-06-07	Last Observation Date	2006-06-07
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EO Data 2006-06-07: In an approx. 30 m segment Withers, Crabtree, and Franklin coll. 12 adult Cambarus pristinus (9 Form II males, 3 females). One adult male and female were coll. as voucher specimens. Numerous other C. pristinus were seen among slabrock. Also observed 4 adult female C. parvovulus "in berry", adult male and juvenile C. parvovulus, and several juv./YOY C. sphenoides. All C. pristinus were found among stacked slabrock that was not embedded.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank	
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EO Rank Comment	In a 30 m segment, 12 Cambarus pristinus were collected by three staff members in one hour.
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Description

General Description	In this 30 m segment upst of bridge: rock and slab on sand; coffee-coloured water; heavy silt load with some clay; substrate is predominantly sand with a small amount of cobble; 90% canopy cover. Readings: DO 5.4 mg/l, pH 6.91, Cond 37.6 uS, Temp 15.2 C.
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MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
One adult male Form II and one adult female collected by DNH.

EO ID:	15323	EO_NUM	26	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Laurel Creek @ Webb Road

Directions Laurel Creek @ Webb Road, approx. 0.15 miles W of Hale Cemetery.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355026N
Cumberland (TN)	35085-G1	Vandever	<u>Longitude</u>	0850725W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

Glenn Rohrbach, Roger Thoma

Surveyors

David Withers, Todd Crabtree, Laura Franklin

Survey Date 2006-08-10

First Observation Date 2006-06-07	Last Observation Date 2006-08-10
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EO Data 2006-08-10: In approx. 1.5 man-hour survey in vicinity of bridge, Thoma, Rohrbach, & Withers coll. numerous Cambarus pristinus: 6 F, 6 M(I), 1 M(II), 2 YOY. Thoma vouchered 5 specimens (2MI, 1MII, 2F) and Withers vouchered 2 MI. Numerous adult C. parvovulus also obs.; 2006-06-07: In an approx. 25 m segment (downstream of the bridge) Withers, Crabtree, and Franklin coll. 10 Cambarus pristinus. Of the C. pristinus collected, there were 4 adult females (3 with young attached), 3 adult Form II males, 2 juv. Form II males, and 1 juv. female. Also, several adult and juv. C. parvovulus were observed. Cambarus pristinus appeared to be the most abundant species at this site. One adult male and female C. pristinus taken as voucher specimens.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment Ten Cambarus pristinus collected in 35 min. by three staff members.

Description

General Description 2006-06-07: Rock, slab, and boulders on gravel and sand with moderately heavy sediment. Slab stacked on slab in some areas. Readings: DO 8.0 mg/l, pH 7.00, Cond 46.6 uS, Temp 17.4 C; 2006-08-10: Mostly still water with only a trickle over base of bridge. Much filamentous algae on u/s side of bridge.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

1 adult male Form II and one adult female Cambarus pristinus collected by DNH on 2006-06-07.

Thoma vouchered 5 specimens (2MI, 1MII, 2F) and Withers vouchered 2 MI on 2006-08-10.

EO ID:	15324	EO_NUM	27	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Laurel Creek @ SR101

Directions Laurel Creek @ SR101 approx. 0.6 miles W Hale Cemetery.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355025N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0850755W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Survey Date 2006-06-14

First Observation Date 2006-06-14	Last Observation Date 2006-06-14
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EO Data 2006-06-14: In an approx. 100 m segment (50 m dnst to 50 m upst of bridge) Withers and Rohrbach coll. 3 Cambarus pristinus (2 adult female and 1 juv. Form II male). One Cambarus pristinus found under a rock in glide immediately dnst of small waterfall. The other two C. pristinus were found under rocks in the first pool upst of waterfall. No live specimen vouchered, but molt of one adult female C. pristinus collected. Observed several adult and juvenile C. parvovulus. Healthy population of stream invertebrates observed.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Downstream generally composed of thick rock bedding or slab on bedrock, providing many hiding places for crayfish, and pools with slab separated by rocky riffles. Small fall line ~ 30 m upstream with deep pools beyond. Good slab cover on bedrock with sand increasing further upstream. Readings at bridge: DO 9.8 mg/l, pH 7.05, Cond. 55.8 uS, Temp 18.3 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

No live specimen vouchered. One molt of adult female Cambarus pristinus collected.

EO ID:	15325	EO_NUM	28	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish			
State Status	E	Global Rank	G1	
Fed. Status		Subnational Rank	S1	

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Puncheoncamp Creek @ Puncheoncamp Creek Road

Directions Puncheoncamp Creek @ Puncheoncamp Creek Road, approx. 1.04 miles SW Thomas Springs.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355012N	
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0851333W	

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Survey Date 2006-06-14

First Observation Date 2006-06-14

Last Observation Date 2006-06-14

EO Data 2006-06-14: In an approx. 50 m segment, Withers and Rohrbach coll. 20 Cambarus pristinus. Many more C. pristinus observed, but not captured. Of 20 C. pristinus coll., there were 10 adult male Form II, 6 adult female with YOY attached, 1 adult female, 2 female juv. and 1 male juv. Most specimens coll. dnst of culvert, several found upstream in long linear pools. Also observed a few C. parvovulus and C. sphenoides. One male Form II C. pristinus vouchered.

EO Rank

Basic EO Rank A - Excellent estimated viability

Origin Subrank

EO Rank Comment

Description

General Description Downstream is rock and slab on sand. Sand is deep and dominating the substrate with moderate sediment. Shallow water, low flow. Deeply shaded (80-90%) with hemlock and umbrella magnolia. Upstream still slab on sand, but lots of fallen timber and CWD, sunfish redds and pools. Readings: DO 7.2 mg/L, pH 6.79, Cond 47.4 uS, Temp 18.9 C, flow ~1 cfs, stream width 5-6 m, stream depth ~5-60 cm.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

One adult male Form II Cambarus pristinus collected by DNH.

EO ID:	15327	EO_NUM	30	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	D? - Possibly poor estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Raccoon Creek @ logging road adj. SR101

Directions Raccoon Creek @ logging road adj. SR101, approx. 0.29 SSW Swallows Cemetery.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354648N
Cumberland (TN)	35085-G2	Herbert Domain	<u>Longitude</u>	0850934W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Survey Date 2006-06-14

First Observation Date	2006-06-14	Last Observation Date	2006-06-14
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EO Data 2006-06-14: Rohrbach and Withers sampled a 50 m segment (25 m upst and 25 m dnst culvert) and collected 1 adult male Form II and 1 adult female Cambarus pristinus. A few C. sphenoides and C. parvovulus were also observed. The female C. pristinus was coll. from upst. side, the male from dnst. side of the culvert. One adult male Form II C. pristinus vouchered.

EO Rank

Basic EO Rank	D? - Possibly poor estimated viability	Origin Subrank
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EO Rank Comment Two Cambarus pristinus collected in 0.5 hours by two staff members. Deep mud in creek, ~ 40 % canopy, many downed trees in creek area.

Description

General Description Logging road with no BMPs. Deep mud in creek above and below culverts. Substrate is rock and slab on sand and cobble, but heavy mud throughout. Many rocks are embedded in mud. Mostly deep pools at crossing, especially upst. possibly due to culvert impoundment. Canopy ~40% with many downed trees in creek area including one large hemlock. Readings: DO 5.3 mg/L, pH 6.56, Cond 54.9, Temp 19.8, stream width ~ 5 m, stream depth var.(5-40cm), flow ~1-2 cfs.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

EO ID:	15328	EO_NUM	31	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

West Fork Creek @ Browntown Road

Directions West Fork Creek @ Browntown Road approx. 0.43 miles NNE of Ridgedale Church.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355528N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0851249W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

Surveyors

Glenn Rohrbach, David Withers

Survey Date 2006-06-15

First Observation Date 2006-06-15

Last Observation Date 2006-06-15

EO Data In an approx. 30 m segment (15 m upst. and dnst. of bridge) Withers and Rohrbach collected 6 Cambarus pristinus, including 2 adult fem. with YOY attached, 1 adult Form II male, 2 juv. male, 1 juv. female. Numerous C. pristinus and C. parvovulus observed in crevices of slab piles. Too many C. pristinus to collect and count. Vouchered 1 adult Form II male and an adult female exoskeleton.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Rock and slab on sand, cobble, and bedrock with minimal sediment. Heavily shaded ~80-90%. Readings: DO 8.6 mg/L, pH 6.91, Cond 47.8 uS, Temp 22.6 C, stream width ~6 m, stream depth ~10-30 cm, flow ~1-2 cfs. Observed large guano pile under bridge with staining above.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

Vouchered 1 adult Form II male, and one adult female exoskeleton.

EO ID:	15352	EO_NUM	32	Scientific Name	Cambarus pristinus	8/30/2006
						EOCODE_BCD: ICMAL07690

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	CD - Fair or poor estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Beam Creek upstream of Claysville Road

Directions Beam Creek approx. 0.1 mile upstream of Claysville Road and approx. 0.22 mile WNW of Raines Cemetery.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355835N
Cumberland (TN)	35085-H2	Pleasant Hill	<u>Longitude</u>	0850829W

Watershed

05130108 - Caney

Physiographic Province

CU

Survey Information

<u>Surveyors</u>	Glenn Rohrbach
<u>Surveyors</u>	Roger Thoma
<u>Surveyors</u>	David Withers

Survey Date 2006-08-10

First Observation Date	2006-08-10	Last Observation Date	2006-08-10
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EO Data 2006-08-10: In approx. 150 m segment from Claysville Road upstream, Rohrbach, Thoma, & Withers coll. 3 YOY/juv male (II) Cambarus pristinus. All 3 were found under slabrock at upstream terminus of segment, and are mapped to this point. Also obs. numerous C. sphenoides throughout the segment, including 3 adult males (I), 4 adult males (II), 7 females, and ~10 juv;
2006-06-02: Condict & Withers conducted ~1 man-hour survey from bridge upstream 50 m, only finding C. parvovulus and C. sphenoides, but abundant aquatic bugs. High water inhibited survey.

EO Rank

Basic EO Rank	CD - Fair or poor estimated viability	Origin Subrank
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EO Rank Comment Site with tremendous amounts of sediment; no adult C. pristinus obs.

Description

General Description This segment contains an extensive amount of fresh silt and old sediment, and clear beaver sign. Some sediment may be coming from an adjacent development (Tanner Place) but more is evident from further upstream. On 10 August the stream was not flowing, but existed as a series of deep linear pools of varying depth. The water was cloudy on our arrival. Many slabrocks were present, but with a high degree of embeddedness. Substrate was sand and gravel but overwhelmed by mud. The sediment issue was reported to TDEC-WPC Cookeville on 15 August 2006.
The same site was visited by DW and KC on 2 June 2006 and the following measurements were taken: pH 7.10, DO 8.3 mg/l, Temp 19.8 C, Cond 66.6 uS.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

3 YOY male (II) C. pristinus vouchered.

Summary

Common Name	"Brawley's Fork Crayfish"	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
BRAWLEYS FORK AT CO. RD. 4401 (SR 64)

Directions "BRAWLEYS FORK AT CO. RD. 4401, 1.6 KM SW BRADYVILLE" (SR 64)

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354340N
Cannon (TN)	35086-F2	Beechgrove	<u>Longitude</u>	0861025W

<u>Watershed</u>	<u>Physiographic Province</u>
05130203 - Stones	CB

Survey Information

<u>Surveyors</u>	Ray Bouchard
<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Withers
<u>Surveyors</u>	Mary Peterson
<u>Surveyors</u>	Geoff Call
<u>Surveyors</u>	Mike Williams
<u>Surveyors</u>	David Sims

Survey Date 2006-04-13

First Observation Date 1971-03-28 Last Observation Date 2006-04-13

EO Data 2006-04-13: Withers coll./rel. 1 small female *Cambarus williami*. 2005-07-20: In approx. 3 man-hour survey of 30 m segment upst. SR 64, M. Williams, D. Sims, & D. Withers coll./rel. 7 *Cambarus williami* (3 females, from approx. 2.5-3.8 cm TL; 4 males, from approx. 1.9-3.2 cm); all males appeared to be Form II; also obs. *Orconectes cf placidus* in abundance; 2004-12-17: G. Call and D. Withers coll. & released 3 male, 8 female, and 1 juv *C. williami* during videotaping of episode for "Tennessee's Wildside" program; 2004-11-12: G. Call (USFWS) and D. Withers found *C. williami* abundant (10+ indiv.) imm. upst. Hwy 64 bridge; 2000-03-21: R. McCoy and D. Withers netted several individuals with ease; 1998-05-02: PETERSON AND WITHERS OBS. NUMEROUS INDIV. BOTH MALE AND FEMALE IMM. UPSTREAM, DOWNSTREAM, AND AT BRIDGE CROSSING. SEVERAL OBS. "WALKING" UPSTREAM USING EDGES OF SUBMERGED BRIDGE SUPPORT. SIX INDIV. COLL. FOR RAY BOUCHARD; 1971-03-28: BOUCHARD COLL. OR OBS. 13 FORM I MALES, 2 FORM II MALES, 2 FEMALES, 1 JUV. MALE, 1 JUV. FEMALE AND 1 OVIGEROUS FEMALE.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank	
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EO Rank Comment

Description

General Description As observed 20 July 2005 in 30 m segment upst SR 64: stream approx. 5-6 m wide, < 10 cm deep, flow 2-3 cfs, cool; canopy 0-80%; As noted previously: FOURTH-ORDER STREAM SEGMENT WITH SMALL COBBLE (CA 1" OR LESS DIA.) AND SOME LARGER STONES.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

EO ID:	4300	EO_NUM	4	Scientific Name	<i>Cambarus williami</i>	EOCODE_BCD:	8/30/2006 ICMAL07920
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Summary

Common Name	"Brawley's Fork Crayfish"	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	E - Verified extant (viability not assessed)	Precision_BCD	S
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Site/Directions

Survey Site Name

SMALL CAVE SPRING ON E. SIDE OF GILLEY HILL ROAD

Directions SMALL CAVE SPRING ON E. SIDE OF GILLEY HILL ROAD, APPROX. 0.6 AIR MILE NW OF GILLEY HILL CHURCH, AND CA 2 MI UPSTREAM OF STREAM CROSSING WHERE GILLEY HILL ROAD TURNS DUE WEST.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	354105N
Cannon (TN)	35086-F2	Beechgrove	<u>Longitude</u>	0860916W
<u>Watershed</u>	<u>Physiographic Province</u>			
05130203 - Stones	CB			

Survey Information

<u>Surveyors</u>	David Withers
<u>Surveyors</u>	Roger McCoy

Survey Date 2006-04-13

First Observation Date	1999-09-22	Last Observation Date	2006-04-13
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EO Data 2006-04-13: Withers coll/rel adult female *C. williami* from under small rock on cobble imm. upst. road edge (confirmed by AV). Also obs. 3 *C. tenebrosus* and probable *Elimia laqueata* (pleurocerid snail); In both 1999 (22 Sept) and 2000 (21 March): ONE *C. WILLIAMI* FEMALE AND 2 *C. TENEBROSUS* OBS. IN ISOLATED CAVE SPRING; SPRING ABUTS GILLEY HILL ROAD, FLOWS UNDER ROAD AND INTO SMALL FARM POND. ADJ. SECTION OF BRAWLEY'S FORK WAS BONE DRY DURING THIS OBSERVATION.

EO Rank

Basic EO Rank	E - Verified extant (viability not assessed)	Origin Subrank
EO Rank Comment	RESTRICTED TO SMALL SPRING AT TIME OF OBSERVATION.	

Description

General Description CAVE SPRING; 13 April 2006: This is a spring resurgence, a portion of which is captured for use by property owner. The site contains deep gravel and cobble and some rock and slab. Downstream of the road the spring is captured in a small cattle pond that flows out through a meadow. Temp 14.9 C/pH 8.08/Cond 218 uS/DO 9.7 mg/l

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	6207	EO_NUM	8	Scientific Name	Cambarus williamsi	EOCODE_BCD:	8/30/2006 ICMAL07920
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Summary

Common Name	"Brawley's Fork Crayfish"	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

LOCKE CREEK at Locke Creek Road

Directions Traveling Hwy 70 east to Woodbury turn left on Woodbury Rd. Just after Culpepper turn left (north) onto Locke Creek Rd. OR From Woodbury take 145 north to Lock Creek Rd. Go left (SE) on Locke Creek Road. In 2000 an individual was netted ~1.0 miles from route 145. This location is approx. 1 air mile NW of Vance Cem.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	355148N
Cannon (TN)	35086-G1	Woodbury	<u>Longitude</u>	0860650W
 <u>Watershed</u>	 <u>Physiographic Province</u>			
05130203 - Stones	CB			

Survey Information

Surveyors Withers & McCoy

Survey Date	2006-04-13		
First Observation Date	2000-06-09	Last Observation Date	2006-04-13

EO Data 2006-04-13: In 15 minute survey, Withers coll. 4 C. williamsi (1 juv male, 1 juv female, 1 ad female, 1 ad male Form II) from cobble bar over bedrock adj. to road. The two adults were vouchered. Noted small burrows in exposed cobble above water line, and on excavating one found ad female C. williamsi in berry (released); 2000-06-09: One C. williamsi was netted at this location by McCoy & Withers. One DOA C. williamsi coll.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank	
EO Rank Comment			

Description

General Description 2006: Small stream with cobble bar over bedrock. Stream 4-5 m wide, 15 cm deep, flow ~2 cfs. Temp 19.0 C/pH 8.47/Cond 297 uS/DO 11.0 mg/l; 2000: Shallow stream with rocky bottom. Stream-side vegetation was herbaceous.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

2000: Dead individual was taken for in-house use.
2006: One adult male (II) and one adult female vouchered by DNH.

EO ID:	15066	EO_NUM	21	Scientific Name	Cambarus williami	8/30/2006
						EOCODE_BCD: ICMAL07920

Summary

Common Name	"Brawley's Fork Crayfish"				
State Status	E		Global Rank	G1	
Fed. Status			Subnational Rank	S1	

Identifiers

Basic EO Rank	A? - Possibly excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

East Fork Stones River

Directions East Fork Stones River adj. to and on N side of Stones River Road, ca 1.6 miles SSE Short Mtn summit, and 1.1 miles W of intersection of Stones River Road and SR 146.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		355042N
Cannon (TN)	35085-G8	Short Mountain	<u>Longitude</u>		0855800W
<u>Watershed</u>		<u>Physiographic Province</u>			
05130203 - Stones		CB			

Survey Information

<u>Surveyors</u>	Roger McCoy
<u>Surveyors</u>	David Ian Withers
<u>Surveyors</u>	Roger Thoma
<u>Surveyors</u>	Glenn Rohrbach

Survey Date 2006-08-11

First Observation Date 2005-05-10	Last Observation Date 2006-08-11
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EO Data 2006-08-11: 45+ adults quickly coll. by Thoma, Rohrbach, & Withers, mostly by seine, including ~50% F and M(II). No M(I) C. williami obs. Some YOY C. williami, O. cf placidus, and adult Cambarus tenebrosus obs.; 2005-05-10: In an approx. 50 m segment, McCoy and Withers obs. 8 Cambarus williami (6 ad male, 1 ad female, 1 juv female). At least one adult male was Form I. One adult male and one adult female were collected as voucher specimens. Cambarus williami specimens were primarily found near edge of stream under small rocks on a cobble substrate.

EO Rank

Basic EO Rank A? - Possibly excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description This was a disturbed area upstream of a new stream crossing to a spoil pile related to ongoing installation of a gas pipeline along Stones River Road. The stream contained rocky cobble, gravel on bedrock- with pools, glides, & riffles; avg. 3 m wide, 15-30 cm deep, and flow 5+ CFS. The stream was cool but with significant recent sediment.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

Specimens coll. by Thoma for OSU collection of crayfishes.

EO ID:	15139	EO_NUM	35	Scientific Name	<i>Cambarus williami</i>	EOCODE_BCD:	8/30/2006 ICMAL07920
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Summary

Common Name	"Brawley's Fork Crayfish"	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

East Fork Stones River near Culpepper

Directions East Fork Stones River near Culpepper, approx. 3.8 air miles W of Woodbury, in short reach approx. 140 m upst (north of) old U.S. 70 bridge.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		354911N
Cannon (TN)	35086-G2	Readyville	<u>Longitude</u>		0860816W
<u>Watershed</u>	<u>Physiographic Province</u>				
05130203 - Stones	CB				

Survey Information

<u>Surveyors</u>	Kirstin Condict
<u>Surveyors</u>	David Ian Withers

Survey Date 2005-10-20

First Observation Date	2005-10-20	Last Observation Date	2005-10-20
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EO Data In riffle/run approx. 140 m upst bridge, obs. 3 juv female and 1 adult female *Cambarus williami*. Also obs. many *Leptoxis praerosa*, *Elimia cf laqueata*, and *Orconectes compressus*. This is the most downstream known occurrence of *C. williami* in E. Fork Stones proper.

EO Rank

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Cobble dominated riffle/run with minimal surface sediment (though much buried beneath), with generally good deep cobble, rock, and some slabrock present. Water depth ~4 cm in riffle/run, to approx. 1 m near bridge. Generally slackwater near bridge, with heavy buried and surface sediment.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

One adult female *C. williami* coll. by DIW

EO ID:	7738	EO_NUM	1	Scientific Name	Orconectes wrighti	8/30/2006
				EOCODE_BCD:	ICMAL11550	

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

ROBINSON CREEK & HOUSTON BRANCH @ SR57

Directions Robinson Creek & Houston Branch, ca 1.5 Miles east of Counce, adj. Pickwick Landing State Park.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350255N
Hardin (TN)	35088-A3	Counce	<u>Longitude</u>	0881505W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

<u>Surveyors</u>	Chris Taylor
<u>Surveyors</u>	David Ian Withers, DNH
<u>Surveyors</u>	Chad Harden, DNH
<u>Surveyors</u>	Chris Hunter, TWRA
<u>Surveyors</u>	Jim Hamlington, TWRA
<u>Surveyors</u>	David Hancock, TSP

Survey Date 2005-10-25

First Observation Date 1996-03-26	Last Observation Date 2005-10-25
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EO Data 2005-10-25: In Robinson Creek from SR 57 bridge upstream to confluence with Houston Branch, and ~50 m upstream into Houston Branch, 6 O. wrighti were collected (1 adult female, 1 adult male (I), 1 cf juv male, and 3 YOY females). Also obs. numerous Procambarus sp. (incl. 1 large adult female to 10 cm TL, several YOY and juv), 1 juv Cambarus sp (male II), and 12+ O. etnieri of all sizes and ages. In approx. 100 m segment of Robinson Creek dnst of bridge, TWRA & TSP staff coll. 10 O. wrighti (4 adult male Form I, 1 adult male Form II, 5 adult females) and several O. cf etnieri. Most O. wrighti were coll. from leaf litter in cut banks. DNH vouchered 1 adult male (I) O. wrighti and 1 adult male (I) O. cf etnieri. TWRA vouchered the same and 1 male (I) Procambarus sp.; 1996-03-26: 13 specimens coll. from Robinson Creek by Chris Taylor (3 form I males; 3 form II males; 7 form I females), INHS 5440.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Withers et al. (2005): Robinson Creek 4-5 m wide, 15-100 cm deep, substrate of cobble and sand. Canopy to 50%. Houston Branch 1-2 m wide, depth and substrate similar to Robinson Ck. Both creeks with moderate sediment. Taylor (1996) : Under small gravel, water depth less than 0.3 m.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
79	PICKWICK LANDING STATE PARK	SSPPK	
73	PICKWICK RESERVOIR RESERVATION	FTVRE	

Documentation

EO ID:	3472	EO_NUM	2	Scientific Name	Orconectes wrighti	EOCODE_BCD:	8/30/2006 ICMAL11550
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Summary

Common Name	A Crayfish			
State Status	E	Global Rank	G1	
Fed. Status		Subnational Rank	S1	

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
SOUTH FORK BEASON CREEK

Directions South Fork Beason Creek. approx. 3.5 air mi E of Adamsville, TN, Hwy 69.

Locators

County	Mapsheets				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351344N	
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>	0881927W	

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	Chris Taylor
<u>Surveyors</u>	Chad Harden, DNH
<u>Surveyors</u>	David Withers, DNH
<u>Surveyors</u>	Chris Hunter, TWRA

Survey Date	2005-10-11
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First Observation Date	1996-07-15	Last Observation Date	2005-10-11
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EO Data 2005-10-11: Withers, Harden, and Hunter surveyed approx. 40 m of S. Fork Beason from SR 69 bridge downstream, and coll. 7 O. wrighti quickly from leaf litter and debris on stream edge (3 adult males Form I, 3 juv/YOY males, and 1 adult female). In 20 m segment of trib to S. Fork adj SR 69 (topo indicates this is Beason Creek proper) they coll/rel 1 large adult male (I) and 1 female O. wrighti from under cutbank ~7 m upst culvert abutment. 1996-07-15: Taylor coll. 11 O. wrighti specimens (1 form I male; 3 form II males; 2 form I females; 5 juvenile females.), INHS 5649.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Withers et al., 2005: S. Fork Beason 3-4 m wide in ~8 m channel, substrate of gravel, cobble, and sand, with riffles and glides, moderate buried sediment, 10-15 cm deep; smaller trib. to 5 m wide and 10-15 cm deep, with gravel, cobble and mud; Taylor, 1996: Under small gravel and in woody debris along edges, water depth less than 0.3 m.

MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
1996: Taylor, C.A. and M.H. Sabaj (INHS #5648)
2005: DNH and TWRA each vouchered 1 Form I male O. wrighti

EO ID:	15137	EO_NUM	3	Scientific Name	Orconectes wrighti	8/30/2006
				EOCODE_BCD:	ICMAL11550	

Summary

Common Name	A Crayfish			
State Status	E	Global Rank	G1	
Fed. Status		Subnational Rank	S1	

Identifiers

Basic EO Rank	C - Fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Chambers Creek at Campbell Mill Road

Directions Chambers Creek and lower Hoover Branch at Campbell Mill Road, on S fringe of TWRA Chambers Creek Wetland Area.

Locators

County		Mapsheet			
	<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350133N
	Hardin (TN)	35088-A3	Counce	<u>Longitude</u>	0881828W
	<u>Watershed</u>	<u>Physiographic Province</u>			
	06040001 - Lower Tennessee-Beech	SC			

Survey Information

<u>Surveyors</u>	David Ian Withers
<u>Surveyors</u>	Chad Harden
<u>Surveyors</u>	Chris Hunter

Survey Date 2005-10-11

First Observation Date	2005-10-11	Last Observation Date	2005-10-11
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EO Data One juv (?) female Orconectes wrighti (~4.2 cm TL) coll/rel by Withers, Harden, & Hunter. Also obs. numerous Procambarus sp. (11 YOY/juv; 1 adult female (~8.0 cm TL)), 6 adult O. cf validus, and a few freshwater shrimp. Most crayfish were coll. from under cutbanks or submerged bank vegetation. One adult male O. cf validus was coll. as a reference specimen.

EO Rank

Basic EO Rank	C - Fair estimated viability	Origin Subrank
EO Rank Comment	Rank based on capture of only 1 individual in 3.5 man-hours.	

Description

General Description This site includes both Chambers Creek from imm. upst of the bridge downstream approx. 100 m, and Hoover Branch from the mouth @ Chambers Creek upst approx. 40 m. Chambers Creek ranges from ~5-10 m wide in a bed to ~15 m wide. The stream averages 15 cm deep but is over 30 cm deep in places. Substrate is cobble but with considerably more sand than obs at S Fork Beason Creek. Canopy cover was <5% in Chambers Creek, but greater in Hoover Branch.

MA/Ownership

Managed Area					
	<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15138	EO_NUM	4	Scientific Name	Orconectes wrighti	EOCODE_BCD:	8/30/2006 ICMAL11550
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Owl Creek @ SR 142

Directions Owl Creek @ SR 142, approx. 0.3 road mile NW of Hurley.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		350829N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>		0882215W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	Withers & Harden
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Survey Date	2005-10-12
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First Observation Date	2005-10-12	Last Observation Date	2005-10-12
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EO Data 2005-10-12: In approx. 50 m segment from bridge upst, Harden & Withers coll. 2 O. wrighti females (1 adult 6.8 cm TL, 1 YOY/juv 4.0 cm TL) and 1 adult male (Form I, 7.9 cm TL). Also obs. adult female O. cf validus and 2 YOY males of same species. The male O. wrighti was coll. under slabrock @ base of bridge support, while all others were found in leaf litter on creek edge or in small tributary on left descending bank upstream of the bridge.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description This is a wide perennial stream with substrate of sand and cobble and containing alternating exposed bars composed of either. Creek avg. 3-5 m wide in overall channel ~10-12 m wide. Depth ~25 cm to ~1 m. Canopy ~30-40%.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen
1 adult male collected and preserved in EtOH.

EO ID:	15140	EO_NUM	5	Scientific Name	Orconectes wrighti	EOCODE_BCD:	8/30/2006 ICMAL11550
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

North Fork Beason Creek @ Glendale Road

Directions North Fork Beason Creek @ Glendale Road, approx. 0.35 mile N of intersection of Glendale Rd and SR 69.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351452N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>	0881952W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

Rohrbach and Withers

Surveyors

Withers, Hunter, & Fritz

Survey Date 2006-04-27

First Observation Date 2005-10-26

Last Observation Date 2006-04-27

EO Data 2006-04-27: In brief examination of 25 m segment from bridge upstream, Rohrbach and Withers obs. 7 O. wrighti (5 adult male (II) & 2 juv female) and 1 adult female Cambarus sp. Vouchered 1 male (II) O. wrighti; 2005-10-26: In segment from approx. 30 m downstream bridge to 40 m upstream, Fritz, Hunter, & Withers coll. numerous O. wrighti in leaf litter on bank or in snags, many of which came from under the bridge. O. wrighti specimens included 10 est. YOY (5 m, 5 f) and 18 adults (8 m, 10 f). All males were Form I. Also obs. 1 Procambarus sp. (7.6 cm TL male).

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description 2006: pH 6.91/temp 17.4 C/cond 62.8 uS/DO 8.4 mg/l, est. flow 2-3 cfs, 100% canopy.
2005: This was a remarkable site. The stream was 1-4 m wide in a channel to 5 m wide, with depth 10 cm - 1 m. Substrate of gravel, cobble, and sand, but clearly was dominated by cobble, with alternating cobble bars and deposits. Moderate sediment and some flocculent iron deposits obs. Flow ~3+ cfs. Upst of the bridge the stream was forested on the right descending bank and bordered by a field on the left, with canopy 60-90%. The substrate appeared more stable than that from other streams examined that day (e.g. Lick Ck).

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

2005: One adult male O. wrighti each coll. by Withers (DNH) and Hunter (TWRA) as reference specimen.

2006: One adult male O. wrighti (II) coll. by DNH.

EO ID:	15336	EO_NUM	6	Scientific Name	Orconectes wrighti	8/30/2006 EOCODE_BCD: ICMAL11550
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	C - Fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Unnamed Tributary to Beason Creek @ Box Elder Road

Directions Unnamed Tributary to Beason Creek @ Box Elder Road, approx. 1.25 miles NW of Box Elder.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351549N
Hardin (TN)	35088-C3	Milledgeville	<u>Longitude</u>	0881915W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Surveyors

Chad Harden, Kevin Fitch

Survey Date 2006-06-20

First Observation Date	2006-06-20	Last Observation Date	2006-06-20
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EO Data 2006-06-20: In an approx. 80 m segment, Withers, Rohrbach, Harden and Fitch observed 2 adult *Orconectes wrighti* (1 Form II male, 1 female), a few *Cambarus* sp. and 4 adult *Procambarus acutus* (3 Form I males, 1 female). Vouchered both adult *O. wrighti* and one Form I male *P. acutus*.

EO Rank

Basic EO Rank	C - Fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Small stream with deep cobble and sand throughout interstices. Minimal to moderate sediment in substrate. Exposed mudstone and layers of conglomerate pebble "cement". Forested upst/dnst of road, canopy ~90%. Stream width 1-4 m, depth 5-30 cm. Readings: DO 7.2 mg/L, pH 6.35, Cond 51.1uS, Temp 24.5C, flow ~1cfs.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

Vouchered 2 *Orconectes wrighti* (1 Form II male, 1 female) and 1 *Procambarus acutus* Form I male.

EO ID:	15337	EO_NUM	7	Scientific Name	Orconectes wrighti	8/30/2006
				EOCODE_BCD:	ICMAL11550	

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Unnamed Tributary to Beason Creek @ Harris Road

Directions Unnamed Tributary to Beason Creek @ Harris Road, approx. 1.6 air miles NW Box Elder.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351541N
Hardin (TN)	35088-C3	Milledgeville	<u>Longitude</u>	0882005W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors David Withers, Glenn Rohrbach

Surveyors Chad Harden, Kevin Fitch

Survey Date 2006-06-20

First Observation Date	2006-06-20	Last Observation Date	2006-06-20
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EO Data 2006-06-20: In an approx. 50 m segment, Withers, Rohrbach, Harden, and Fitch collected 4 Orconectes wrighti (2 adult females, 2 adult Form II males) and 1 juv. Cambarus sp. Vouchered one male and one female O. wrighti.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Small stream with substrate composed of sand and cobble, exposed limestone and layers of conglomerate pebble "cement", minimal sediment throughout stream. At least 2 small artesian springs adjacent to left bank dnst of bridge. ~80% canopy on either side of bridge. Readings: DO 7.5 mg/L, pH 6.55, Cond 69.7 uS, Temp 21.3 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

Vouchered 2 Orconectes wrighti (1 Form II male, 1 female).

EO ID:	15338	EO_NUM	8	Scientific Name	Orconectes wrighti	8/30/2006 EOCODE_BCD: ICMAL11550
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AB - Excellent or good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
North Fork Beason Creek @ Old Union Road

Directions North Fork Beason Creek @ Old Union Road, approx. 0.55 miles N of Bethlehem.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351540N
Hardin (TN)	35088-C3	Milledgeville	<u>Longitude</u>	0882056W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	David Withers, Glenn Rohrbach, Kevin Fitch
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Survey Date	2006-06-20
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First Observation Date	2006-06-20	Last Observation Date	2006-06-20
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EO Data 2006-06-20: In an approx. 50 m segment, Withers, Rohrbach, and Fitch collected 7 adult Orconectes wrighti (4 female, 3 Form II males) from open water and under slabrock. Most O. wrighti coll. in open. No other crayfish species observed. 1 large Form II male taken as voucher specimen.

EO Rank

Basic EO Rank	AB - Excellent or good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Medium stream with cobble and sand substrate, moderate siltation. Some large slabrock in stream, possibly from construction of the road, little CWD, leaf litter, and overhanging roots. Highly shaded on both sides of bridge, ~80% canopy. Stream width 2-5 m in channel, depth 5-50 cm, and flow ~1-2 cfs. Readings: DO 6.1 mg/L, pH 6.14, Cond 70.8 uS, Temp 21.8 C.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen
1 large adult Form II male Orconectes wrighti taken as voucher.

EO ID:	15339	EO_NUM	9	Scientific Name	Orconectes wrighti	8/30/2006
				EOCODE_BCD:	ICMAL11550	

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B - Good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Robinson Creek @ May Hall Road

Directions Robinson Creek @ May Hall Road, approx. 0.81 air miles E of Counce.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350228N
Hardin (TN)	35088-A3	Counce	<u>Longitude</u>	0881533W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	David Withers, Glenn Rohrbach
<u>Surveyors</u>	Chad Harden, Kevin Fitch

Survey Date	2006-06-21
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First Observation Date	2006-06-21	Last Observation Date	2006-06-21
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EO Data 2006-06-21: In an approx. 50 m segment (10 m dnst and 40 m upst) Withers, Rohrbach, Harden, and Fitch observed 5 Orconectes wrighti (1 adult female, 4 YOY), numerous YOY/juv. Orconectes sp (O. etnieri and/or O. validus), and 1 adult Procamburus sp. Collectors did not voucher O. wrighti, but vouchered 1 DOA juvenile Orconectes sp.

EO Rank

Basic EO Rank	B - Good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Small stream, sand and cobble substrate with moderate to heavy sediment. Some beaver activity upstream. Very little canopy at TVA powerline, but good shade otherwise. Much CWD, some leaf litter, little slabrock. Stream width 3-5 m, depth 5-50 cm, flow ~2cfs. Readings: DO 7.4 mg/L, pH 6.77, Cond 62.7 uS, Temp 21.7 C.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
Vouchered 1 DOA juv Orconectes sp.

EO ID:	15340	EO_NUM	10	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B - Good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Owl Creek @ SR224

Directions Owl Creek @ SR224 approx. 2.53 miles south of Stantonville.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		350718N
McNairy (TN)	35088-A4	Michie	<u>Longitude</u>		0882522W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	David Withers, Glenn Rohrbach
<u>Surveyors</u>	Chad Harden, Kevin Fitch

Survey Date	2006-06-22
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First Observation Date	2006-06-22	Last Observation Date	2006-06-22
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EO Data 2006-06-22: In an approx. 85 m segment, Withers, Rohrbach, Harden, and Fitch collected 12+ Orconectes wrighti (1 adult Form II male, 1 adult female, 10+ juv/YOY), and several O. etnieri. Vouchered 1 adult Form II male O. wrighti, and 1 juv. Form II male O. etnieri.

EO Rank

Basic EO Rank	B - Good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Upstream of bridge is silty with sand substrate, presumably channeled. Lots of rip rap around bridge, water clouded easily. Downstream of bridge are alternating pools and riffles with more cobble than upstream. Stream is deeply incised, good available leaf litter, some limestone slabrock. Stream width 6-7 m, stream depth ~60+ cm, flow ~ 3 cfs.
Readings: DO 6.8 mg/L, pH 7.18, Cond 187.3 uS, Temp 23.6 C.

MA/Ownership

Managed Area					
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>	

Documentation

Specimen
Vouchered 1 adult Form II male Orconectes wrighti, and 1 juv Form II male O. etnieri.

EO ID:	15341	EO_NUM	11	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AB - Excellent or good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Little Owl Creek @ SR224

Directions Little Owl Creek @ SR224, approx. 3.05 miles south of Stantonville.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350700N
McNairy (TN)	35088-A4	Michie	<u>Longitude</u>	0882537W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Surveyors

Chad Harden, Kevin Fitch

Survey Date 2006-06-22

First Observation Date	2006-06-22	Last Observation Date	2006-06-22
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EO Data 2006-06-22: Surveyors observed 10+ juv. Orconectes wrighti in a 40 m segment upstream of bridge. Also observed other juv. Orconectes sp. (likely either O. validus or O. etnieri). Vouchered 1 juv. Form II male O. wrighti, 1 DOA juv., 1 molt, 1 Cambarus pincer.

EO Rank

Basic EO Rank	AB - Excellent or good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Heavy rip rap at bridge, most rocks embedded, and deep pools downstream. Good cobble and sand substrate beginning ~20 m upstream of bridge. Left descending bank rip rapped at bridge, heavy sediment in this area.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

Vouchered 1 juv form II male Orconectes wrighti, 1 DOA juv, 1 molt, and 1 Cambarus sp. pincer.

EO ID:	15342	EO_NUM	12	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AB - Excellent or good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Middle Fork Owl Creek @ Albert Robinson Road

Directions Middle Fork Owl Creek @ Albert Robinson Road, approx. 2.57 air miles SW of Stantonville.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350821N
McNairy (TN)	35088-B4	Stantonville	<u>Longitude</u>	0882753W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

<u>Surveyors</u>	2006-06-22: David Withers, Glenn Rohrbach
<u>Surveyors</u>	Chad Harden, Kevin Fitch
<u>Surveyors</u>	2006-06-29: David Withers, Glenn Rohrbach
<u>Surveyors</u>	Todd Crabtree

Survey Date 2006-06-29

First Observation Date 2006-06-22	Last Observation Date 2006-06-29
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EO Data 2006-06-29: Brief revisit to find adult Orconectes wrighti. Withers, Rohrbach, and Crabtree quickly collected 4 YOY O. wrighti dnst of bridge. Time cut short due to road being resurfaced with blacktop, couldn't find adults. No vouchers taken; 2006-06-22: In an approx. 105 m segment (30 m dnt bridge, 75 m upst bridge), Withers, Rohrbach, Harden, and Fitch collected 10+ juv/YOY Orconectes wrighti, 1 Cambarus sp., and 10+ Orconectes sp. (likely O. etnieri or O. validus). Surveyors did not collect any adults. Vouchered 4 juv. Orconectes (2 of both sp.) and a Procambarus pincer.

EO Rank

Basic EO Rank	AB - Excellent or good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Small stream with deep sand and some cobble dnt of bridge, exposed grey marl on right descending bank. Downstream is deep to ~60 cm with good leaf litter, moderate sediment, ~80% canopy in forested riparian zone. Upstream is primarily exposed grey marl with some cobble. Many fossilized mussels (Exogyra costata) protruding. Readings: DO 8.7 mg/L, pH 8.01, Cond. 227 uS, Temp 25.2 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

Vouchered 2 juv. Orconectes wrighti, 2 juv Orconectes sp., and a Procambarus pincer.

EO ID:	15343	EO_NUM	13	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Stratton Branch @ Old Morris Chapel Road

Directions Stratton Branch @ Old Morris Chapel Road, approx. 2.23 air miles NE of Adamsville (from intersection of SR22 and US64).

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351441N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>	0882110W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach

Surveyors

Chad Harden, Kevin Fitch

Survey Date 2006-06-22

First Observation Date	2006-06-22	Last Observation Date	2006-06-22
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EO Data 2006-06-22: Surveyors collected 2 adult Orconectes wrighti (1 Form II male, 1 female) in rip rap upst of bridge, 1 juv/YOY O. wrighti collected adjacent to bridge. Also observed several YOY Orconectes sp. (likely O. validus or O. etnieri). Vouchered 1 adult O. wrighti Form II male.

EO Rank

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description 3-5 m wide stream with deep cobble and sand, moderate sediment, and good leaf litter. Canopy cover ~50%. Stream depth variable ~15 cm, flow ~1 cfs. Readings: DO 8.2 mg/L, pH 6.48, Cond 56.6 uS, Temp 22.6 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

1 adult Form II male Orconectes wrighti.

EO ID:	15344	EO_NUM	14	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Dollar Creek @ Old Morris Chapel Road

Directions Dollar Creek @ Old Morris Chapel Road, approx. 2.16 air miles ENE of Adamsville (from intersection of SR22 and US64).

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351429N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>	0882112W
 <u>Watershed</u>	 <u>Physiographic Province</u>			
06040001 - Lower Tennessee-Beech	SC			

Survey Information

Surveyors David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date	2006-06-27		
First Observation Date	2006-06-27	Last Observation Date	2006-06-27

EO Data 2006-06-27: In an approx. 75 m segment (25 m upst bridge, 50 dntst bridge), surveyors collected 8 Orconectes wrighti (3 adult male Form II, 2 adult female, 1 juv. female, 2 YOY) in leaf litter, around CWD, and under rip rap at bridge. Did not observe any other species. 2 O. wrighti (1 adult Form II male, 1 adult female) taken as voucher specimens.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
EO Rank Comment		

Description

General Description Small stream with mixed cobble/sand substrate and heavy buried sediment. Stream is shallow but there are deep pools and glides near bridge. Good leaf litter and CWD present in stream. The canopy cover is ~50-80%.
Readings: DO 7.2 mg/L, pH 6.65, Cond 78.2, Temp 20.6 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

1 adult Form II male, and 1 adult female Orconectes wrighti.

EO ID:	15345	EO_NUM	15	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Beason Creek @ Seaton Loop

Directions Beason Creek @ Seaton Loop, approx. 1.1 miles W of Crump.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351329N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>	0882020W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-27

First Observation Date	2006-06-27	Last Observation Date	2006-06-27
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EO Data 2006-06-27: In an approx. 30 m segment, upstream of the bridge, Withers, Rohrbach, and Crabtree collected 10 Orconectes wrighti (5 adult Form II males, 3 adult females, 2 juv. females) within a 30 minute period. Several O. wrighti collected in open water resting on cobble substrate, or marginally buried, in ~10 cm water. Withers observed one additional adult male under a branch on cobble and 1 adult molt. Vouchered 2 O. wrighti (1 adult Form II male, 1 adult female).

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Great cobble (deep) and sand substrate, clear water, but moderately heavy buried sediment throughout stream. The stream was mainly riffles and glides with some deeper pools. Canopy cover ~50% and composed mainly of River Birch. Stream width was 2.5-5.0 m, stream depth 5-60+ cm, flow ~1-2 cfs. Readings: DO 7.7 mg/L, pH 7.13, Cond 87.8 uS, Temp 22.1 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

1 adult form II male and 1 adult female Orconectes wrighti.

EO ID:	15346	EO_NUM	16	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Dillon Branch @ Benny Road

Directions Dillon Branch @ Benny Road, approx. 0.72 air miles SW of Hurley.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350755N
McNairy (TN)	35088-B4	Stantonville	<u>Longitude</u>	0882233W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-27

First Observation Date 2006-06-27

Last Observation Date 2006-06-27

EO Data 2006-06-27: In an approx. 35 m segment (10 m dnst bridge, 25 m upst bridge), Withers, Rohrbach, and Crabtree collected 7 Orconectes wrighti (4 adult females, 3 adult Form II males) in 20 minutes. Many O. wrighti found resting on cobble, also collected from under cutbanks, leaf litter and CWD. Also collected 2 adult female O. etnieri. Vouchered 2 O. wrighti (1 Form II male, 1 female), and 1 adult female O. etnieri.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Good mix of cobble and sand with minimal buried sediment. No obvious algal growth on cobble. Livestock access on downstream side of bridge where there was no canopy cover. 100% canopy upstream of bridge. Stream width 4-5 m, depth 15-40 cm, and flow ~1 cfs. Readings: DO 6.5 mg/L, pH 6.82, Cond 51.3 uS, Temp 22.2 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

EO ID:	15347	EO_NUM	17	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AB - Excellent or good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Howell Branch @ Pratt Road

Directions Howell Branch @ Pratt Road, approx. 1.0 air miles SSW of Hurley.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350729N
Hardin (TN)	35088-A3	Counce	<u>Longitude</u>	0882222W
	35088-B3	Pittsburg Landing		

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-28

First Observation Date	2006-06-28	Last Observation Date	2006-06-28
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EO Data 2006-06-28: 4 Orconectes wrighti (3 ad. Form II males, 1 ad. female) quickly found amongst the cobble and leaf litter. One additional O. wrighti was observed, but not collected. Numerous O. etnieri juv./YOY. One O. wrighti w/ single large pincer had much wider banding than other 3, may have been a regenerated pincer. All O. wrighti collected dnst of bridge, none observed upst. Vouchered 2 adult O. wrighti (1 Form II male, 1 female) and 1 juv O. etnieri.

EO Rank

Basic EO Rank	AB - Excellent or good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Gravel and sand substrate with moderate buried sediment. 80% canopy cover both up and downstream of the bridge. Layers of exposed conglomerate cobble "pavement" in stream bank as well as clay and siltstone. Readings: DO 18.9 mg/L, pH 6.42, Cond. 36.6 uS, Temp 18.9 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15348	EO_NUM	18	Scientific Name	Orconectes wrighti	8/30/2006 EOCODE_BCD: ICMAL11550
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Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	B? - Possibly good estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Winningham Branch @ Pratt Road

Directions Winningham Branch @ Pratt Road, approx. 1.18 air miles SW of Hurley.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	350730N
McNairy (TN)	35088-A4	Michie	<u>Longitude</u>	0882244W
	35088-B4	Stantonville		

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-28

First Observation Date	2006-06-28	Last Observation Date	2006-06-28
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EO Data 2006-06-28: In an approx. 50 m segment (30 m dnst bridge, 20 m upst bridge), Withers, Rohrbach, and Crabtree collected 2 small adult Orconectes wrighti (1 ad Form II male, 1 ad female), one under the bridge among rip rap and one dnst in leaf litter. Also observed 4 ad. O. etnieri (1 Form I male, 3 female), 1 juv. O. etnieri, and 1 juv. Cambarus sp. One ad. O. wrighti Form II male, and one ad. Form I male O. etnieri taken as voucher specimens.

EO Rank

Basic EO Rank	B? - Possibly good estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Substrate predominantly cobble and sand with moderate buried sediment. Steady flow over rip rap at the bridge, otherwise the stream is small and sluggish. Upstream has deep herbaceous canopy (elderberry, sumac, blackberry) underlain by cobble conglomerate. Downstream the creek is recently timbered (bad timber mgt.) on left descending bank with cattle present. Stream channel is deeply incised. Readings: DO 5.8 mg/L, pH 5.95, Cond. 49.7 uS, Temp 18.6 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

Vouchered 1 ad O. wrighti male (Form II) and 1 ad O. etnieri male (Form I).

EO ID:	15349	EO_NUM	19	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	A - Excellent estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name

Clear Creek @ confluence of Fulwood Branch @ SR224

Directions Clear Creek @ confluence of Fulwood Branch @ SR224, approx. 1.0 road mile N of Stantonville on SR224.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351009N
McNairy (TN)	35088-B4	Stantonville	<u>Longitude</u>	0882558W

Watershed

06040001 - Lower Tennessee-Beech

Physiographic Province

SC

Survey Information

Surveyors

David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-28

First Observation Date 2006-06-28	Last Observation Date 2006-06-28
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EO Data 2006-06-28: Withers, Rohrbach, and Crabtree quickly collected 6 adult Orconectes wrighti (3 Form II males, 3 females) in rip rap under bridge. Also observed a few juv/YOY O. wrighti in leaf litter upst and dnst of bridge. Darters in breeding colors present. Two adult O. wrighti (one Form II male, one female) taken as voucher specimens.

EO Rank

Basic EO Rank	A - Excellent estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description Good cobble/sand substrate with minimal sediment in cobble and generally clear water. Abundant leaf litter in stream. Shallow water upstream, deeper downstream (depth 10-50 cm). Stream width 1-6 m, and flow 1-2 cfs. ~50% canopy cover upstream. Readings: DO 5.1 mg/L, pH 6.64, Cond 94.5 uS, Temp 22.6 C.

MA/Ownership

Managed Area

<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>
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Documentation

Specimen

Two adult Orconectes wrighti (1 Form II male, 1 female) taken as voucher specimens.

EO ID:	15350	EO_NUM	20	Scientific Name	<i>Orconectes wrighti</i>	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Clear Creek @ SR117

Directions Clear Creek @ SR117, approx. 4.2 miles S of Adamsville on SR117.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351030N
McNairy (TN)	35088-B4	Stantonville	<u>Longitude</u>	0882320W
<u>Watershed</u>	<u>Physiographic Province</u>			
06040001 - Lower Tennessee-Beech	SC			

Survey Information

<u>Surveyors</u>	David Withers, Todd Crabtree, Glenn Rohrbach
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Survey Date	2006-06-29		
First Observation Date	2006-06-29	Last Observation Date	2006-06-29

EO Data 2006-06-29: In an approx. 70 m segment (20 m dnst bridge, 50 m upst bridge) Withers, Rohrbach, and Crabtree collected 5 *Orconectes wrighti* (1 ad male Form II, 1 ad female, 3 juv/YOY) and 1 ad form I male *O. etnieri*. The ad female *O. wrighti* was collected in rip rap under bridge, the ad male was found backed into a hole in exposed grey marl/siltstone upst of bridge. Vouchered ad Form II male *O. wrighti* and ad Form I male *O. etnieri*.

EO Rank

Basic EO Rank	AC - Excellent, good, or fair estimated viability	Origin Subrank	
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EO Rank Comment

Description

General Description In this section of Clear Creek: winding stream with deep pools and riffles; stream approx. 3 m wide and 10-60 cm deep in some pools; flow 2-3 cfs; substrate deep cobble and sand with algae on exposed surfaces and moderate sediment in cobble; forested riparian canopy upst (40%) and dnst of bridge; much CWD and some leaf litter; Readings: DO 7.5 mg/L, pH 6.8, Cond 74.1uS, Temp 19.0 C.

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15351	EO_NUM	21	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	BC - Good or fair estimated viability	Precision_BCD	S
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Site/Directions

Survey Site Name
Graham Creek @ SR117

Directions Graham Creek @ SR117, approx. 2.88 miles S of Adamsville on SR 117.

Locators

County	Mapsheets			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351141N
McNairy (TN)	35088-B4	Stantonville	<u>Longitude</u>	0882343W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

Surveyors David Withers, Glenn Rohrbach, Todd Crabtree

Survey Date 2006-06-29

First Observation Date 2006-06-29 **Last Observation Date** 2006-06-29

EO Data 2006-06-29: In an approx 85 m segment (10 m dnst bridge, 75 m upst bridge) Withers, Crabtree, and Rohrbach collected 2 Orconectes wrighti (1 ad male Form II, 1 ad female) from rip rap under bridge. Also observed many O. etnieri in and around rip rap. Vouchered 1 male O. wrighti Form II.

EO Rank

Basic EO Rank	BC - Good or fair estimated viability	Origin Subrank
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EO Rank Comment

Description

General Description In this segment of Graham Creek: Deep sand and cobble substrate with moderate to heavy sediment; sand more dominant; upst (60% canopy) and dnst (70% canopy) good riparian zone; stream has sinous course with deep pools and some runs; small trib enters immediately upst of bridge; stream width 4-5 m; stream depth 15-40 cm, deeper in some pools; flow 2-3 cfs; Readings: DO 6.8 mg/L, pH 6.75, Cond 91.7 uS, Temp 18.3 C.

MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen

EO ID:	15360	EO_NUM	22	Scientific Name	Orconectes wrighti	8/30/2006
						EOCODE_BCD: ICMAL11550

Summary

Common Name	A Crayfish		
State Status	E	Global Rank	G1
Fed. Status		Subnational Rank	S1

Identifiers

Basic EO Rank	H - Historical	Precision_BCD	S
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Site/Directions

Survey Site Name
North Fork Beason Creek @ SR69

Directions North Fork Beason Creek @ SR69, ~4 road miles S of Morris Chapel.

Locators

County	Mapsheet			
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>	351554N
Hardin (TN)	35088-C3	Milledgeville	<u>Longitude</u>	0882113W

<u>Watershed</u> 06040001 - Lower Tennessee-Beech	<u>Physiographic Province</u> SC
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Survey Information

<u>Surveyors</u>	INHS
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Survey Date	1974-04-12
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First Observation Date	1974-04-12	Last Observation Date	1974-04-12
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EO Data 1974-04-12: Specimen(s) collected by Illinois Natural History Program. No further details included in record.

EO Rank

Basic EO Rank	H - Historical	Origin Subrank
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EO Rank Comment

Description

General Description	Stream crossing of SR69.
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MA/Ownership

Managed Area				
<u>MA ID</u>	<u>Name</u>		<u>Type</u>	<u>Contained</u>

Documentation

Specimen
INHS 827, 12 April 1974

EO ID:	15361	EO_NUM	23	Scientific Name	<i>Orconectes wrighti</i>	EOCODE_BCD:	8/30/2006 ICMAL11550
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Summary

Common Name	A Crayfish	Global Rank	G1
State Status	E	Subnational Rank	S1
Fed. Status			

Identifiers

Basic EO Rank	H - Historical	Precision_BCD	S
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Site/Directions

Survey Site Name
Snake Creek @ SR22

DirectionsSnake Creek @ SR22, ~3 road miles S of Crump.

Locators

County	Mapsheet				
<u>County Name</u>	<u>Mapsheet Code</u>	<u>Mapsheet Name</u>	<u>Latitude</u>		351049N
Hardin (TN)	35088-B3	Pittsburg Landing	<u>Longitude</u>		0881937W

<u>Watershed</u>	<u>Physiographic Province</u>
06040001 - Lower Tennessee-Beech	SC

Survey Information

<u>Surveyors</u>	Dave Etnier, UTK
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Survey Date	1968-10-19		
First Observation Date	1968-10-19	Last Observation Date	1968-10-19

EO Data1968-10-19: David Etnier (UTK) coll. 1 adult male (I) and 2 female O. wrighti at this location. Specimens typed by Ray Bouchard.

EO Rank

Basic EO Rank	H - Historical	Origin Subrank
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EO Rank Comment

Description

General Description

MA/Ownership

Managed Area			
<u>MA ID</u>	<u>Name</u>	<u>Type</u>	<u>Contained</u>

Documentation

Specimen
USNM 217942