Mr. Ken Salazar
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, N.W.
Washington DC 20240

July 24, 2012

Janet Mizzi, Chief, Division of Endangered Species
Ecological Services, Southeast Regional Office
U.S. Fish and Wildlife Service
1875 Century Blvd.
Atlanta, GA 30345

RE: Sixty-day notice of violation of section 4(b)(3)(A, and B) of the Endangered Species Act, relating to a late finding on a petition to list the Obey Crayfish (*Cambarus obeyensis*) as an endangered species.

Dear Secretary Salazar,

This letter serves as a sixty-day notice from the Center for Biological Diversity, Tierra R. Curry, and other interested parties of intent to sue you pursuant to the Endangered Species Act ("ESA") for failing to make required findings on a petition to list the Obey Crayfish (*Cambarus obeyensis*) as a threatened or endangered species under the Endangered Species Act. 16 U.S.C. § 4(b)(3)(A) and (B). This letter is being provided to you pursuant to the 60-day notice requirement of the citizen suit provision of the ESA. 16 U.S.C. § 1540(g)(2)(C).

In response to a petition to list a species as threatened or endangered, the ESA requires the Secretary to within 90 days determine whether the petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted ("90-day finding"), and within 12 months to determine whether listing is warranted, not warranted, or warranted but precluded ("12-month finding"). 16 U.S.C. § 1533(b)(3)(A) and (B). The petition for the Obey Crayfish was filed April 20, 2010. The U.S. Fish and Wildlife Service issued a positive 90-day finding on the petition on September 27, 2011. Federal Register, 76: 59836-59862. A 12-month finding was due on April 20, 2011. Accordingly, you are in violation of the law and have abrogated your duty to ensure that protection of endangered species occurs in a timely manner thereby avoiding *further decline and increased risk of extinction.*

The Obey Crayfish is a narrow endemic restricted to the Hurricane Creek basin, a headwater tributary of the East Fork Obey River on the northwestern edge of the Cumberland Plateau in Tennessee. Its total global range encompasses only

42 stream kilometers. It is classified as critically endangered by the International Union for the Conservation of Nature, as critically imperiled by NatureServe, and as endangered by the American Fisheries Society. It is currently classified as threatened by the state of Tennessee, but has been recommended for endangered status based on its narrow range and severe threats to its continued existence.

There are high magnitude imminent threats to the Obey Crayfish. Specific activities which threaten the species are agriculture, sand mining, surface coal mining, logging, and residential development. The crayfish is also threatened by drought.

The state of Tennessee has issued a water pollution permit for the construction of a confined poultry laying house on Hurricane Creek. Pollution from the henhouse could drive the Obey Crayfish to extinction. There are no existing regulatory mechanisms which will adequately protect the crayfish from the animal waste from the henhouse or from the other threats to its survival. Without Endangered Species Act protection, the Obey Crayfish could become extinct in the very near future.

If the Secretary does not make the required finding for the Obey Crayfish or contact us to develop a timeline for making this finding within the next sixty days, we intend to file suit. Please contact me if you have any questions or if you would like to discuss this matter.

Sincerely,

Tierra R. Curry
Conservation Biologist
Center for Biological Diversity
PO Box 11374
Portland, OR 97211
tcurry@biologicaldiversity.org

July 20, 2012

TO: Janet Mizzi, Chief, Division of Endangered Species
Ecological Services, Southeast Regional Office
U.S. Fish and Wildlife Service
1875 Century Blvd.
Atlanta, GA 30345

CC: Erin O'Brien
Division of Water Pollution Control
Tennessee Department of Environment & Conservation
401 Church St.
Nashville, TN 37243-1534

Ed Carter
Executive Director
Tennessee Wildlife Resources Agency
440 Hogan RD
Nashville, TN 37220

RE: Supplementary information in support of protecting the Obey Crayfish (*Cambarus obeyensis*) under the Endangered Species Act

Dear Ms. Mizzi:

Please accept this supplementary information submitted on behalf of the Center for Biological Diversity in support of the protection of the Obey Crayfish (*Cambarus obeyensis*) under the Endangered Species Act.

RANGE

The Obey Crayfish (*Cambarus obeyensis*) is a narrow endemic restricted to headwater tributaries of the East Fork Obey River on the northwestern edge of the Cumberland Plateau in Tennessee (Figures 1 and 2). It is confined to the Hurricane Creek basin, an area of approximately 42 stream kilometers. It has been collected from five sites in the basin-- in Hurricane Creek proper, in Little Hurricane Creek, and in Little Piney Creek (Thoma 2006, p. 2). It was previously thought, based on a specimen in the Smithsonian collection (USNM collection # 206969), that the Obey Crayfish also once occurred in Dripping Springs Creek, a tributary to Meadow Creek, a northerly flowing tributary just southwest of Hurricane Creek, but this was a misidentification. Thoma and Williams (In Prep.) report that the specimen from Dripping Springs Creek is actually *C. (J.) crinipis*, which confines the range of the Obey Crayfish to the Hurricane Creek basin. From 2004 to 2005, Williams et al. (2006) surveyed all known and suspected locations for the Obey Crayfish. They did not locate any new populations that would indicate a range expansion. They did record a new stream locality record in Little Piney Creek, a small tributary to Hurricane Creek (p. 3).

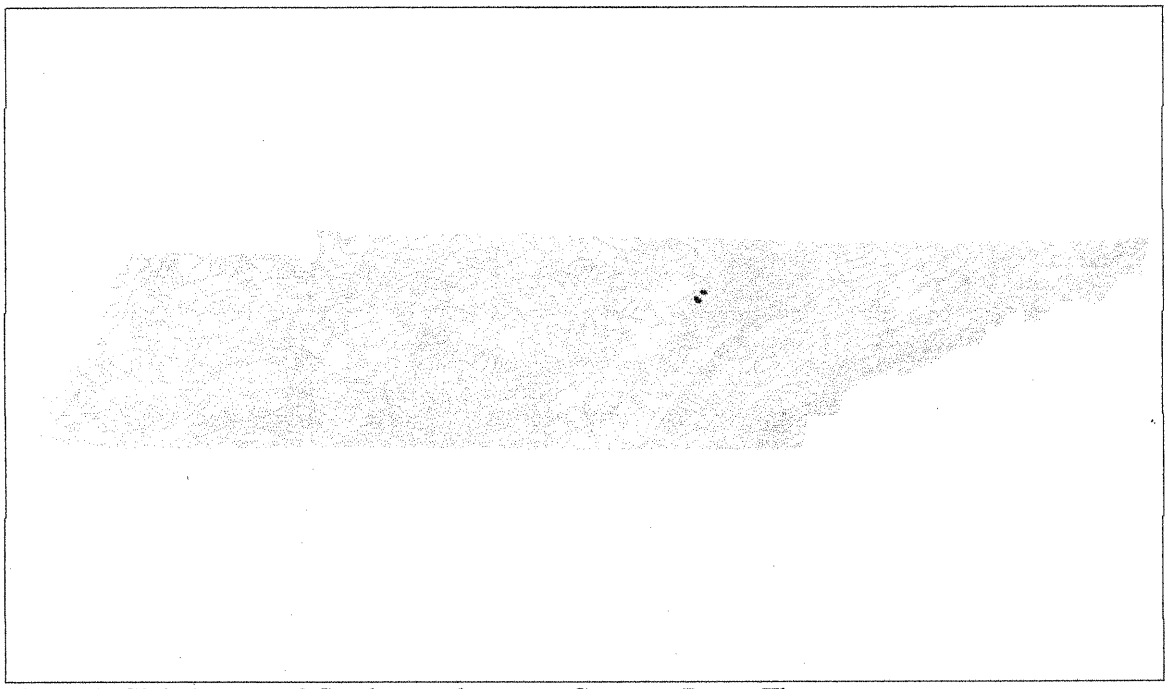

Figure 1. Global range of *Cambarus obeyensis*. Courtesy Roger Thoma.

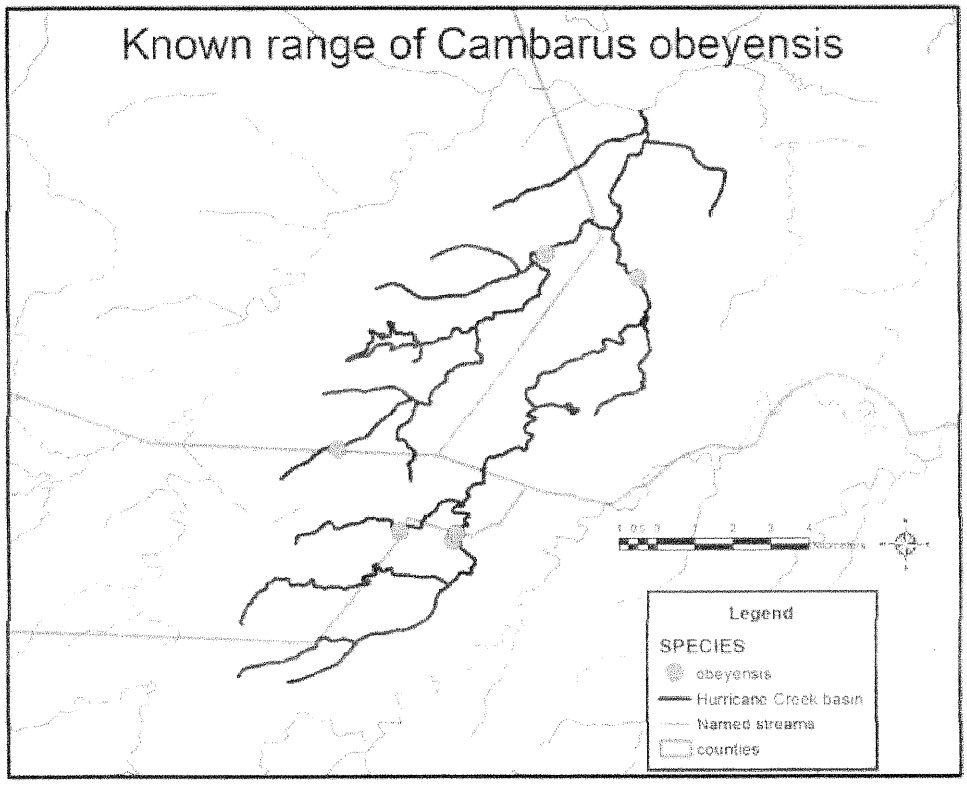

Figure 2. Hurricane Creek basin *Cambarus obeyensis* sites. Courtesy Roger Thoma.

STATUS

The Obey Crayfish is an FWS Region 4 Species of Concern that is known from only four counties-- Cumberland, Fentress, Overton, Putnam (Butler 2002). It received a positive 90-day finding for ESA listing on September 27, 2011 (76 FR 59836).

The Obey Crayfish is listed as threatened by the Tennessee Wildlife Resources Commission due to its small range distribution and threats from habitat degradation. Williams et al. (2006) recommend elevating its state ranking to endangered based on its extremely small range and the likelihood of continued stream degradation (p. 6).

The Crayfish Subcommittee of the American Fisheries Society (AFS) published reviews of crayfish status in 1996 and 2007 (Taylor et al. 1996, 2007). The Obey Crayfish is the only crayfish whose status classification worsened from 1996 to 2007 and it was re-categorized from threatened to endangered status (Taylor et al. 2007, Guiasu 2009). The International Union for the Conservation of Nature has elevated its status from vulnerable (1996) to critically endangered (IUCN 2010). It is ranked as critically imperiled by NatureServe (G1S2).

NATURAL HISTORY

The Obey Crayfish is scientifically significant because there are only six taxa in its species complex, a group that is likely more than 100 million years old (Thoma 2005). The species group is characterized by several ancestral character traits and appears to represent the earliest condition of the first members of the subgenus Jugicambarus. It is likely that the ancestor of the group was one of the first resident epigean (above ground) crayfish of the Cumberland Plateau (Thoma 2006, p. 1).

The habitat of the Obey Crayfish is small to large headwater streams with rock/rubble substrate, large rocks for cover, and moderate to slow current (Thoma 2006, p. 2; Williams et al. 2006, p. 3). It is a tertiary burrower (Thoma 2006, p. 1), meaning that it makes shallow depressions under cobbles and boulders in streams and does not exhibit complex burrowing behavior (Loughman 2008).

THREATS

Organisms with restricted natural ranges are extremely vulnerable to extirpation (Gilpin and Soulé 1986). Because it is so rare and localized, the Obey Crayfish could become severely endangered or driven to extinction with relatively small-scale habitat alteration (Taylor 2000, Guiasu 2009, NatureServe 2012).

The Obey Crayfish is threatened by habitat loss due to water quality degradation from point and non-point source pollution (Williams et al. 2006, p. 2). Crayfish are vulnerable to pollution from excessive sedimentation, heavy metals, and pesticides (Hobbs and Hall 1974, Butler 2002, Guiasu 2009). Excessive sedimentation can fill in the interstitial spaces between rocks, render the substrate unsuitable for crayfish, and eliminate the

invertebrates on which crayfish feed (Henley et al. 2000, Thoma 2006, p. 2, Westhoff et al. 2011, p. 12). Toxic metals and pesticides can accumulate in the body tissues of *Cambarus* crayfish and have negative impacts on growth, reproduction, general metabolism, and life span (Guiasu 2009, p. 735-736).

Specific activities which threaten the Obey Crayfish are agriculture, sand mining, surface coal mining, logging, and residential development (Williams et al. 2006, p. 2). The crayfish is also threatened by drought (IUCN 2010, NatureServe 2012).

A proposed commercial poultry laying house poses a high magnitude imminent threat to the survival of the Obey Crayfish. The Mazelin Pullet House Project applied for an NPDES permit for storm water discharges associated with construction activity, permit number TNR171657, in April 2012 (TDEC 2012). The receiving stream for the henhouse is Hurricane Creek (TDEC 2012). The currently effective General NPDES Permit for Discharges of Storm Water Associated with Construction Activities for the henhouse is Permit No. TNR100000 issued on May 23, 2011, effective on May 24, 2011, and expiring on May 23, 2016 (Environmental and Civil Engineering Services 2012). The laying house had not applied for a Confined Animal Feeding Operation (CAFO) permit as of July 18, 2012 (Erin O'Brien, Tennessee Division of Water Pollution Control, personal communication to Tierra Curry July 18, 2012), but a CAFO permit may not be required if the number of hens is less than 25,000, the threshold at which a permit would be required (O'Brien 2010).

There are no existing regulatory mechanisms which will adequately protect the Obey Crayfish from the pollution which will result from the poultry house. The chicken manure from the poultry house could either be spread on the ground on site, hauled away, or some combination thereof. Chicken manure will contribute pollutants to Hurricane Creek including nitrogen, phosphorus, organic matter, sediments, pathogens, heavy metals, hormones, ammonia, and fecal coliform bacteria (Hartel et al. 2000, GAO 2008, EPA 2012), any or all of which could harm the Obey Crayfish. For example, Westhoff et al. (2011) found that factors related to agriculture were the most influential anthropogenic variables in modeling crayfish presence, and that *Orconectes hylas*, the woodland crayfish, was negatively associated with the presence of confined animal feedlot operations (p. 2423).

Sand mining is also a primary threat to the Obey Crayfish. The total distribution of the crayfish is located on commercially viable sand layers suitable for open pit mining. Mining would have multiple impacts on the species through increased sediment loads, flow alterations and water quality reductions from waste water discharges, thermal pollution, groundwater depletion from pumping resulting in stream drying, and possible accidental oil or chemical spills (Thoma 2006, p. 2; Thoma and Williams In Prep., p. 2). The potential for accidental spills poses a particularly high threat to the crayfish due to its small range which heightens the threat from stochastic events (NatureServe 2012).

Groundwater depletion from mining would magnify the threat posed to the crayfish by drought (Thoma 2006, p. 3, NatureServe 2012). During a drought in 2008, most of the

streams dried completely, and numerous dead crayfish specimens were observed (NatureServe 2012). The drying event may have resulted in a loss of more than fifty percent of the species' population (IUCN 2010, NatureServe 2012).

Sand mining could drive the Obey Crayfish to extinction (Thoma 2006, p. 4). In March 2007 a state water pollution permit was issued to Plateau Sand, LLC for the Plateau Sand Mine, permit number TN0079600 (TDEC 2008). All extant *C. obeyensis* populations are located in the area down slope of the proposed Plateau Sand Mine and its associated groundwater (Thoma 2006, p. 3). The permit for the proposed Plateau sand mine expired in March 2012 before the mine was actually constructed (Sharon Kington, Mine Inspector, Tennessee Division of Water Pollution Control, personal communication to Tierra Curry July 18, 2012). Had the sand mine been constructed, it could have driven the Obey Crayfish to extinction (Thoma 2006, p. 4). There are no existing regulatory mechanisms which would have protected the crayfish from mining operations, as demonstrated by the issuance of the permit for the mine. Though this particular mine was not constructed, sand mining remains a threat to the Obey Crayfish because its total range is within commercially viable sand layers (Thoma and Williams In Prep. p. 2).

The Plateau Sand Mine and the Mazelin Pullet House are both examples of permits that have been issued that could lead to the extinction of the Obey Crayfish. Increasing residential development and poor logging and agricultural practices further threaten the Obey Crayfish (NatureServe 2012). To ensure the continued survival of the crayfish, Thoma and Williams (In Prep. p. 2) recommend that no NPDES discharges be allowed in the Hurricane Creek Basin. They state, "[I]t is evident that this crayfish should be designated Federal Endangered and concerted efforts should be made to protect its continued existence" (Thoma and Williams In Prep. p. 3).

Due to the high magnitude imminent threats to the survival of the Obey Crayfish, the Center urges FWS to immediately propose it for listing as an endangered species.

Thank you for taking our comments into consideration.

Sincerely,

Tierra R. Curry
Conservation Biologist
Center for Biological Diversity
PO Box 11374
Portland, OR 97211
tcurry@biologicaldiversity.org
928-522-3681

References

Butler, R.S. 2002. Crayfishes of the Lower Tennessee Cumberland Ecosystem, with Emphasis on the Imperiled Fauna. Prepared for the Lower Tennessee Cumberland Ecosystem Team, U.S. Fish and Wildlife Service. Asheville, North Carolina Field Office. 36 pp.

Environmental and Civil Engineering Services. 2012. Storm Water Pollution Prevention Plan, Roger and Linda Mazelin Property, Mazelin Laying House Project. March 30, 2012. 95 pp.

Gilpin, M.E and M.E. Soulé. 1986. Minimal viable populations: processes of species extinction. Pp. 19-34 *in*: M.E. Soulé, ed. Conservation Biology: the science of scarcity and diversity. Sinauer Associates, Sunderland, Massachusetts.

Guiasu, R.C. 2009. Conservation, status, and diversity of the crayfishes of the genus *Cambarus* Erichson, 1846. (Decapoda, Cambaridae). Crustaceana 82(6): 721-742.

Hartel, P.G., W.I. Segars, J.D. Summer, J.V. Collins, A.T. Phillips, and E. Whittle. 2000. Survival of fecal coliforms in fresh and stacked broiler litter. Journal of Applied Poultry Research 9:505–512.

Henley, W.F., M.A. Patterson, R.J. Neves, and A.D. Lemly. 2000. Effects of sedimentation and turbidity on lotic food webs: a concise review for natural resource managers. Reviews in Fisheries Science 8(2): 125-139.

Hobbs, H.H., Jr., and E.T. Hall, Jr. 1974. Crayfishes (Decapoda: Astacidae). Pp. 195-214 *in*: C.W. Hart, Jr., and S.L.H. Fuller, eds. Pollution ecology of freshwater invertebrates. Academic Press, New York.

Hobbs, H.H., Jr. and C.S. Shoup. 1947. Two new crayfishes (Decapoda, Astadidae) from the Obey River Drainage in Tennessee. Journal of the Tennessee Academy of Science.

International Union for the Conservation of Nature (IUCN). 2010. *Cambarus obeyensis*. IUCN Red List of Threatened Species. Version 2012.1. Available at: http://www.iucnredlist.org/apps/redlist/details/3677/0

Loughman, Z.J. 2008. Muddling with Mudbugs: West Virginia's Burrowing Crayfishes. West Virginia Wildlife. Spring 2008. 3 pp.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 19, 2012).

O'Brien, E. 2010. State of Tennessee General State Operating Permit for Concentrated Animal Feeding Operations (CAFOs), Rationale. Tennessee Division of Water Pollution Control. 4 pp.

Taylor, C.A., G.A. Schuster, J.E. Cooper, R.J. DiStefano, A.G. Eversole, P. Hamr, H.H. Hobbs, III., H.W. Robison, C.E. Skelton, R.F. Thoma. 2007. A Reassessment of the conservation status of crayfishes of the United States and Canada after 10+ years of increased awareness. Fisheries 32(8): 372-389.

Taylor, C.A. 2000. Preserving North America's unique crayfish fauna. Essay 3, pp. 36-37 *in*: R.A. Abell, D.M. Olson, E. Dinerstein, P.T. Hurley, J.T. Diggs, W. Eichbaum, S. Walters, W. Wettengel, T. Allnutt, C.J. Loucks, and P. Hedao, eds. Freshwater ecoregions of North America: a conservation assessment. World Wildlife Fund, United States. Island Press,Washington DC.

Taylor, C.A., M.L. Warren, J.F. Fitzpatrick, H.H. Hobbs, R.F. Jezerinac, W.L. Pflieger, and H.W. Robison. 1996. Conservation Status of Crayfishes of the United States and Canada. Fisheries 21(4):25-38.

Tennessee Department of Environment and Conservation (TDEC). 2012. Mazelin Pullet House Project Permit, Water Pollution Permits Database. http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=9034:34031:1250154175956401::NO:34031:P34031_SITE_ID:70793

Tennessee Department of Environment and Conservation (TDEC). 2008. Plateau Sand Mine Permit, Highway 62 Mine, Water Pollution Permits Database. http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=9034:34051:200947087512715 4::NO:34051:P34051_PERMIT_NUMBER:TN0079600

Thoma, R.F. and C.E. Williams. In Prep. Conservation of imperiled crayfish—*Cambarus (Jugicambarus) obeyensis* Hobbs and Shoup 1947 (Decapoda: Cambaridae). In preparation.

Thoma, R.F. 2006. An assessment of *Cambarus obeyensis* and potential impacts from Plateau Sand Mine activities (Permits # NR06MS.005, NR06MS.006 & NPDES Permit TN0079600). Prepared for Brian Paddock. 4 pp.

Thoma, R.F. 2005. *Cambarus (Cambarus) eeseeohensis* (Decapoda: Cambaridae), a new species of crayfish from the Linville River of North Carolina and its bearing on understanding the evolution of the subgenus *Cambarus*. Proceedings of the Biological Society of Washington, 118(4): 794-802.

U.S. Fish and Wildlife Service (FWS). 2011. Partial 90-Day Finding on a Petition To List 404 Species in the Southeastern United States as Endangered or Threatened With Critical Habitat. 76 FR 59836.

U.S. Government Accountability Office (GAO). 2008. Concentrated Animal Feeding Operations: EPA needs more information and a clearly defined strategy to protect air and water quality from pollutants of concern. GAO-08-944. 85 pp.

U.S. Environmental Protection Agency (EPA). 2012. How do CAFOs impact the environment? Website. Available at: http://www.epa.gov/region7/water/cafo/cafo_impact_environment.htm

Westhoff, J.T., C.F. Rabeni, and S.P. Sowa. 2011. The distributions of one invasive and two native crayfishes in relation to coarse-scale natural and anthropogenic factors. Freshwater Biology 56: 2415–2431.

Williams, C.E., R.D. Bivens, and B.D. Carter. 2006. A status survey of the Obey Crayfish (*Cambarus obeyensis*). Tennessee Wildlife Resources Agency. March 2006. 19 pp.