



**Scientific Report
2008 Edition**

Southeastern Fishes Council Desperate Dozen

IT IS NO SECRET THAT OUR NATIVE AQUATIC ANIMALS ARE IN DECLINE. There are currently 582 species of animals on the Federal list of endangered and threatened species, 268 of these (46%) are found in freshwater habitats. Of the amazing assemblage of 675 fishes found in southeastern waters, more than a quarter are considered imperiled. While all of the Earth's ecosystems are in trouble, freshwater habitats are recognized to be at severe risk because of their scarcity and the high demands placed on them by humans. The combined effects of agriculture, damming, dredging, construction, logging, overharvest, and pollution are destroying this critical resource for animals, plants, and even ourselves. This major conservation crisis calls for immediate action to conserve and protect the remaining populations and their habitats. The Southeastern Fishes Council (SFC), a nonprofit scientific organization dedicated to the study and conservation of freshwater and coastal fishes of the southeastern United States, is one of the many organizations attempting to reverse the decline of our southeast aquatic habitats and their rich biodiversity.

One of the most important steps in conservation is prioritization. The SFC sought to determine where conservation actions would have the largest impact on preventing loss of our freshwater diversity. We decided to focus our efforts on the Desperate Dozen, the 12 fish species we identified as most likely to become extinct in the Southeast. We chose this list in order to reverse their precipitous decline and assist in putting them on the path to recovery. These twelve species are not currently economically important to humans, and their extinction could easily go unnoticed by all but conservation biologists and ichthyologists. Even so, their conservation matters. These species are the canaries in the coal mine, alerting us to the problem that something is very, very wrong in our backyards. Fishes that were once widespread in larger rivers, such as the diamond darter, are now suffering from the same water quality issues that cause harm to humans. Fishes that were once used for commercial gain, such as the Alabama sturgeon, are now too rare for harvest. We have ignored our freshwater to the point where we no longer remember that rivers used to be more common than reservoirs in the Southeast, and our diversity was a resource worth protecting.

It is SFC's goal to use this list to raise awareness of the plight of our freshwater habitats in the Southeast, which include rivers, creeks, wetlands, springs, and caves. The current crisis requires education, communication, and coordination among our neighbors. We have to learn how to prevent harm to our watersheds and develop new collaborations between private and public entities to promote wise development. By highlighting these twelve species, ranging from the spring pygmy sunfish to the Alabama sturgeon, we hope to encourage these partnerships to address the needs of our freshwater animals and hopefully prevent them from slipping quietly into extinction.

SFC created a list of the most imperiled southeastern fishes by considering species with the highest risk of extinction. Criteria used, in order of importance, was distribution (a single population ranked highest), low abundance, and severity of threats. After the ranking based on level of imperilment, species were arranged in phylogenetic order so that all would receive equal attention. Experts on each species provided brief accounts on the Desperate Dozen, which include background, distribution, abundance, threats, and proposed conservation actions. The U.S. Fish and Wildlife Service (USFWS) was not consulted in SFC's identification of the Desperate Dozen fishes, as we intentionally chose to work as an independent scientific panel under the criteria stated above.

THE DESPERATE DOZEN:

ALABAMA STURGEON, *Scaphirhynchus suttkusi*

SLENDER CHUB, *Erimystax cahni*

CHUCKY MADTOM, *Noturus crypticus*

ALABAMA CAVEFISH, *Speoplatyrhinus poulsoni*

PYGMY SCULPIN, *Cottus paulus*

DIAMOND DARTER, *Crystallaria cincotta*

VERMILION DARTER, *Etheostoma chermocki*

RELICT DARTER, *Etheostoma chienense*

BAYOU DARTER, *Etheostoma rubrum*

PEARL DARTER, *Percina aurora*

CONASAUGA LOGPERCH, *Percina jenkinsi*

SPRING PYGMY SUNFISH, *Elassoma alabamae*

The Desperate Dozen is represented by a sturgeon, minnow, catfish, cavefish, sculpin, six darters, and a pygmy sunfish. Five species are restricted to Alabama, two in Mississippi, and one each in Kentucky, Tennessee, and West Virginia; two species are found in two states (Tennessee and Georgia and Tennessee and Virginia). Seven species have always been restricted to a small area, some to a single spring or cave, while five were historically wider ranging. Half of the Desperate Dozen occupy smaller bodies of water (springs, cave pools, creeks), while the other half live in medium and large rivers (Table 1). The main threat for all of these species is their relatively restricted ranges, where one acute pollution or habitat destruction event could cause extinction. Habitat alteration also impacts all species, from dams, channelization, and head-cutting in rivers and creeks to pumping of groundwater and the presence of impervious surfaces in recharge areas for caves and springs. All of these habitat alterations potentially lead to population fragmentation. Water pollution, especially sedimentation, is also a prevalent for all Desperate Dozen species (Table 2).

While each Desperate Dozen species has its own specific set of issues, many have very similar conservation actions. Those species occupying smaller habitats and ranges can greatly benefit from a watershed management plan that involves all public and private stakeholders in mitigating current conditions that contribute to habitat degradation and in planning for wise development in the future. Watershed management plans require cooperation and coordination between municipal, state, federal, and non-government agencies, but can be relatively inexpensive, which is very important in these times of economic shortfalls. Other common conservation actions include monitoring a species' abundance, assessing water quality and quantity in its habitat, surveying to look for additional populations, developing propagation programs where appropriate, and examining the genetic diversity within and between populations (Table 3).

Only five of the Desperate Dozen are listed as endangered by the USFWS; three are considered threatened, two are candidate species for listing, and two have no federal status. Of the eight listed species, five do not have critical habitat determined and two are without approved recovery plans. SFC hopes to reduce these inconsistencies in federal protection among the Desperate Dozen to help these fishes get on the road to recovery.

Oral presentations giving a general overview for each of the Desperate Dozen will be given at the Southeastern Fishes Council annual meeting on the morning of 13 November 2008 in Chattanooga, TN. A document outlining the Desperate Dozen with discussion and accounts similar to this draft manuscript will be published in the Proceedings of the Southeastern Fishes Council in 2009. Below are accounts for the Southeastern Fishes Council Desperate Dozen.

1. Alabama sturgeon - *Scaphirhynchus suttkusi*
2. Slender chub - *Erimystax cahni*
3. Chucky madtom - *Noturus crypticus*
4. Alabama cavefish - *Speoplatyrhinus poulsoni*
5. Pygmy sculpin - *Cottus paulus*
6. Diamond darter - *Crystallaria cincotta*
7. Vermilion darter - *Etheostoma chermocki*
8. Relict darter - *Etheostoma chienense*
9. Bayou darter - *Etheostoma rubrum*
10. Pearl darter - *Percina aurora*
11. Conasauga logperch - *Percina jenkinsi*
12. Spring pygmy sunfish - *Elassoma alabamiae*



***Scaphirhynchus suttkusi* – Alabama Sturgeon**

Background: One of the rarest vertebrates globally, the Alabama sturgeon is also the smallest of eight North American sturgeon species (maximum fork length 30.7 in [78 cm]). The Alabama sturgeon was federally listed as Endangered in 2000, and critical habitat has been proposed. This species is state protected and considered Highest Conservation Concern in Alabama.

Distribution: Historically encompassed 1600 km of large rivers, including the Black Warrior, Tombigbee, Alabama, Cahaba, Coosa, Tallapoosa, Mobile, and Tensaw rivers. Currently it occupies only 524 km in the lower Cahaba and Alabama rivers in south Alabama.

Abundance: No population estimates available; very rare. An estimated 19,000 Alabama sturgeon were commercially harvested in 1898, indicating an abundant historic population. However, very little information on abundance existed between 1898 and the early 1980s; although collection data and anecdotal reports indicated a general decline in abundance. Sampling efforts in the mid-1980s yielded only six Alabama sturgeon, with an additional five specimens collected from 1997 to 1999. Over the last nine years only two specimens have been collected, one captured and released in the lower Cahaba River in 2000 and the other captured, sonic tagged and released below Claiborne Lock and Dam in 2007.

Threats: Historic unrestricted commercial harvesting likely triggered the initial decline. Thereafter, years of habitat alteration proved detrimental, with large dams and navigation locks fragmenting free-flowing riverine habitats with a series of impoundments. These structures block migratory routes to spawning grounds and disrupt natural flow patterns leading to unsuitable conditions for feeding and larval development. Extensive dredging in the Mobile Basin has transformed rivers into channels lacking gravel bars, shoals, and woody structures.

Current Conservation Actions:

1. Continued tracking of sonic tagged individual to identify new sampling sites and provide information on current habitat requirements. Partners: Alabama Department of Conservation and Natural Resources (ADCNR) and USFWS.
2. Continued sampling for viable adults to establish propagation program. ADCNR.

Proposed Conservation Actions:

1. Pursuing fish passage at the three US Army Corps of Engineers (USACE) hydro projects on the Alabama River. Partners: ADCNR, Alabama Power Company (APC), The Nature Conservancy (TNC), USACE, and USFWS.
2. Development of baseline water quality model for the Alabama River. Partners: Alabama Department of Environmental Management (ADEM), APC, and USFWS.
3. Protect and maintain current habitat conditions.

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***Erimystax cahni* – Slender Chub**

Background: The slender chub (maximum total length 3.7 in [94 mm]) was described in 1956. At that time it had not been collected in 17 years, but it was rediscovered in the Powell River in 1964. The slender chub was listed as federally Threatened with critical habitat designated in 1977. A recovery plan has been developed. It is currently listed as Threatened by the states of Tennessee and Virginia. Previous conservation actions include several status surveys.

Distribution: Historically known from the Clinch, Powell, and Holston rivers in the upper Tennessee River drainage, northeastern Tennessee and southwestern Virginia. In the past quarter century the slender chub has been known from fewer than 100 river km in the Powell and Clinch rivers in Tennessee and Virginia.

Abundance: No population estimates available; very rare. Through 1987, a total of only ~420 individuals had been collected as a result of ~90–100 collecting efforts in the Clinch and Powell rivers. Eight specimens were captured in a single collection in 1987 in the Clinch River, but since then only a single specimen has been collected in the Clinch River. Despite intensive efforts during favorable conditions in both the Clinch and Powell, including over 740 person-hours effort since 2000, no additional specimens have been found.

Threats: Reduced range increases vulnerability to extinction. Severe chronic and acute water pollution from factories, sewage, and coal mines, excessive sedimentation from agricultural runoff, and gravel removal threaten slender chub populations and habitat. The highly porous karst geology and relatively narrow floodplains elevates nutrients and pollutants leeching into the Clinch and Powell rivers.

Proposed Conservation Actions:

1. Continue to conduct surveys in order to determine the status of this species.
2. Determine the causes of decline, using a surrogate species if necessary, and minimize or eliminate threats utilizing legal mechanisms to protect the species and its habitat (i.e., land acquisition and conservation easements; controlling/restricting mining, pollution, and agricultural practice).
3. If individuals are collected, determine the best methods for protecting and increasing the population numbers (e.g., captive propagation and reintroduction of adults and/or juveniles).
4. Address potential genetic concerns, such as possible hybridization.
5. Gather life history information, including specific invertebrate food items and critical food population levels necessary for the slender chub, which are currently unknown.

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***Noturus crypticus* – Chucky Madtom**

Background: The Chucky madtom, a small catfish (maximum size 2.9 in total length [74 mm]), was not described until 2005. It is listed as Endangered by the state of Tennessee. Federal listing of the Chucky madtom was first discussed in 1994, and was given official candidate status twelve years later. USFWS has funded multiple surveys and worked with the Middle Nolichucky Watershed Association on an action plan for Little Chucky Creek. USFWS has completed seven Partners for Fish and Wildlife projects in the Little Chucky Creek watershed with support from the Greene County Soil Conservation District, the Natural Resources Conservation Service (USDA), the Tennessee Valley Authority, and the Tennessee Wildlife Resources Agency. These projects have installed riparian fencing, stabilized banks, and created alternate water sources for livestock.

Distribution: Historically known from only two streams in the French Broad River system of the upper Tennessee River drainage in northeastern Tennessee. It is considered extirpated from Dunn Creek (Little Pigeon River system, Sevier County), where a single specimen was collected in 1940, and is known recently (1991–2004) from two sites separated by 3 river km in Little Chucky Creek (Nolichucky River system, Greene County, TN).

Abundance: No population estimates are available, but very rare. The largest collection, nine specimens from the two Little Chucky Creek sites over two days, was made in 1994 and, despite intensive field surveys by several independent groups, only three specimens have been captured since (one in 2000 and two in 2004, for a total of 14 known specimens).

Threats: Extremely small range increases vulnerable to extinction. Sedimentation from poor agricultural practices, including erosion due to removal of riparian vegetation and livestock access to the streambed, have visibly degraded the habitat in Little Chucky Creek. It is also possible that chemical contamination from agricultural runoff have had an adverse effect.

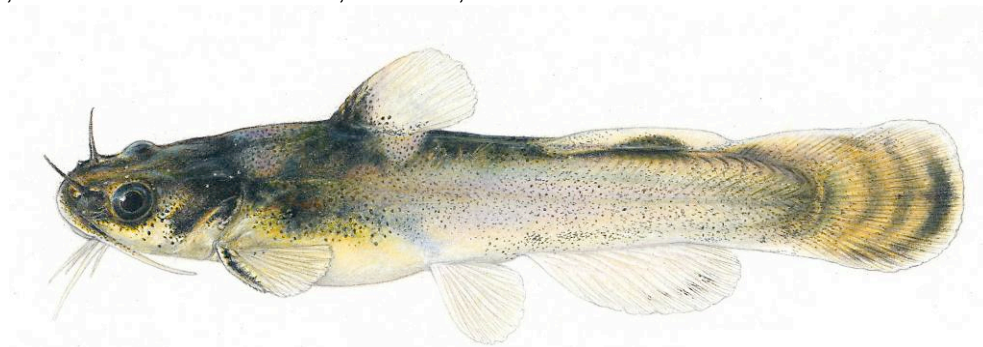
Proposed Conservation Actions:

1. Within the Little Chucky Creek, it is imperative that the successful Partners for Fish and Wildlife projects are monitored, supported, and extended to new areas. The focus of these agreements has been and should continue to be the improvement of stream conditions via a watershed management plan.
2. A captive breeding program must be developed so it can be activated quickly upon the capture of additional specimens.
3. There should be a continuous and intensive survey effort throughout the French Broad River system that utilizes a wide variety of sampling methods throughout the year.

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***Speoplatyrhinus poulsoni* – Alabama Cavefish**

Background: The rarest and most cave-adapted of only five species of North American cavefishes, the Alabama cavefish (maximum size 2.8 in [70 mm]) is white, lacks eyes and pelvic fins, and has a snout with a bill-like appearance. It was described in 1974, listed as federally Threatened with critical habitat in 1977, and reclassified as Endangered in 1988. A revised recovery plan was approved in 1990. The Alabama cavefish is state protected and is considered as a species of Highest Conservation Concern in Alabama. Previous conservation actions include status surveys in the 1980s and 1990s and the establishment of the Key Cave National Wildlife Refuge in the high recharge area of Key Cave.

Distribution: Restricted to Key Cave in Lauderdale County in northwestern Alabama within the Tennessee River drainage.

Abundance: Extremely rare; total population estimated to be less than 100 individuals and the maximum number observed during a single visit to cave is 10 individuals.

Threats: Extremely small native range and subterranean specialization increases vulnerability to extinction. The Key Cave aquifer and recharge area are threatened by urban and industrial growth which can lead to lowering of water table, diminished winter flows (cues to synchronize spawning), and acute and chronic water pollution. Disruption of gray bat colony could interrupt critical nutrients entering the deep cave ecosystem.

Proposed Conservation Actions:

1. Protect Key Cave aquifer by more precisely delineating the recharge area and by using a management plan that addresses urban and industrial growth and agricultural practices within the unprotected recharge area to prevent lowering of water table, diminished winter flows (cues to synchronize spawning), and acute and chronic water pollution. This includes consistent networking and collaboration between federal and state agencies, non-government organizations, local governments and businesses, and private landowners to formulate unique strategies to protect groundwater.
2. Establish regular status surveys for Alabama cavefish and gray bats and monitor water quality and quantity in Key Cave to detect any issues in a timely manner.
3. Gather additional population and life history information for the Alabama cavefish.
4. Unsurveyed caves in the vicinity of Key Cave that have pools should be examined for additional populations of Alabama cavefish.

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***Cottus paulus* – Pygmy Sculpin**

Background: The smallest sculpin in North America (rarely greater than 1.5 in [38 mm]), the pygmy sculpin was described 1968. It was listed as federally Threatened in 1989, is state protected, and is considered a species of Highest Conservation Concern in Alabama. Previous conservation actions include implementation of a minimum daily flow of the spring and water quality monitoring within the spring recharge area. Studies on pygmy sculpin have included population monitoring, habitat use, reproductive biology, and competitive interactions with crayfish and the larger banded sculpins (*Cottus carolinae*).

Distribution: Restricted to Coldwater Spring and spring run in east-central Alabama in the Coosa River drainage.

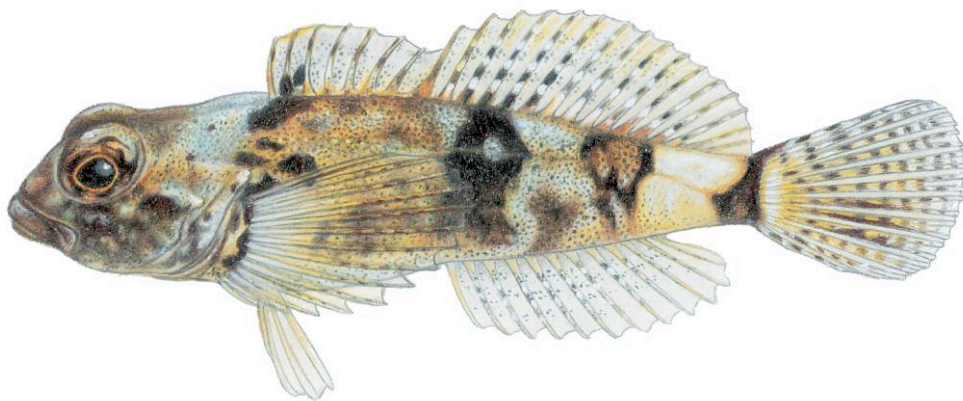
Abundance: Approximately 25,000 individuals in the spring pool and 2,500 in the spring run.

Threats: Extremely small native range and complete dependence on Coldwater Spring aquifer increases vulnerability to extinction. Although it is protected in the spring with an agreement between U.S. Fish and Wildlife Service and the Anniston Water Works and Sewer Board (which removes less than half of the 32 million gallons per day outflow), groundwater contamination is a concern from the nearby Anniston Army Depot where hazardous compounds are stored. Banded sculpin, which are excluded from the spring pool by a weir, are a potential predation threat to pygmy sculpin in the spring pool. Predation and/or competition with this species, together with limited habitat and changes in water quality, may limit the population size of pygmy sculpin in the spring run and its distribution in Coldwater Creek.

Proposed Conservation Actions:

1. Continue to develop and implement methods for removal of contaminants from Dry Creek and the recharge area of the aquifer. Environmental Protection Agency, USFWS and the US Army are working towards decreasing the threat of groundwater contamination.
2. Continue working with Anniston Water Works and Sewer Board to maintain minimum spring flows. Continue water quality monitoring (Coldwater Spring) and groundwater monitoring by other agencies (wells throughout spring recharge area and Dry Creek).
3. Establish a monitoring program for pygmy sculpin in the spring pool and run.
4. Implement regular monitoring of Coldwater and Dry creeks for pygmy sculpin and banded sculpin.

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***Crystallaria cincotta* – Diamond Darter**

Background: One of only two species of darters in the genus *Crystallaria*, the diamond darter (maximum size 3 in [77 mm SL]) was described recently (2008) and not yet reviewed for federal listing, but considered as extremely rare and critically imperiled in West Virginia. Previous conservation actions include genetic analyses, a distribution and habitat assessment, and a threat assessment.

Distribution: Historically occurred within the Ohio River basin in the Cumberland, Elk, Green, and Muskingum River drainages in Kentucky, Ohio, Tennessee, and West Virginia. Extirpated from Kentucky, Ohio, and Tennessee; extant within the lower 36 km of the Elk River in west-central West Virginia.

Abundance: No population estimates available; very rare. Despite concerted sampling efforts, only 16 individuals collected from Elk River in 28 years; 12 individuals collected during period of 1980 to 2005 and 4 collected in 2008.

Threats: Reduced range increases vulnerability to extinction. Large dams, river channel and flow modifications, water quality degradation from urban and rural sources, excessive sedimentation, and the effects of habitat fragmentation are likely principal causes for its widespread extirpation. Its rarity in the Elk River may be attributed to degradation of benthic habitats by sedimentation.

Proposed Conservation Actions:

1. Conduct additional sampling and monitoring of the Elk River population to assess abundance and further define the distribution range.
2. Sample additional streams within the Ohio River drainage where populations were previously present.
3. Initiate a captive breeding program if and when appropriate broodstock can be obtained. Maintain a captive population, and draft a plan for a reintroduction program. Include studies of reproductive biology and early life history as additional components of the captive breeding program.

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***Etheostoma chermocki* – Vermilion Darter**

Background: This brightly colored darter (maximum size 2.4 in [60 mm]) was described in 1992 and was listed as federally Endangered in 2001. It is state protected and considered a species of Highest Conservation Concern in Alabama. Previous conservation actions include status surveys, examination of population genetics, a life history study, and propagation techniques using the Warrior darter (*Etheostoma bellator*) as a surrogate. In addition, a federal recovery plan has been developed for this species.

Distribution: Restricted to only 12 km of Turkey Creek and two of its tributaries in the Locust Fork system of the Black Warrior River drainage in north-central Alabama.

Abundance: Small population estimated from 1,667 to 2,919 individuals in the late 1990s. Variably common at scattered locations within its range, however several populations have shown significant decline since 1990s.

Threats: Extremely small native range and fragmented populations within that range plus benthic specialization increases vulnerability to extinction. The species occupies an area of increasing and often poorly regulated urban and industrial development which has led to heavy sedimentation, eutrophication, streambed modifications, as well as flashy runoff and fluctuating flows.

Proposed Conservation Actions:

1. Continue to work with public and private stakeholders on sustaining and improving the watershed management plan designed to encourage Best Management Practices in construction, forestry, and agriculture in order to reduce sedimentation, nonpoint source pollution, and stormwater runoff, improve water quality, and protect and enhance riparian zones. Current stakeholders, including Jefferson County, the city of Pinson, the Society to Advance Resources at Turkey Creek, Freshwater Land Trust, and the State of Alabama, have made significant gains in protecting area within the Turkey Creek watershed.
2. Establish regular status surveys of existing populations and continue monitoring stream habitats, water quality, and flows.
3. Obtain additional life history and habitat data.
4. Develop and implement a habitat restoration plan.

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***Etheostoma chienense* – Relict Darter**

Background: This small darter (maximum size 3 in [76 mm]) was described in 1992 and listed as federally Endangered in 1993. It is listed in Kentucky as Endangered and is considered a species in need of conservation action. A draft recovery plan was issued in 1994, but a final plan has not been completed. Previous conservation actions include information on distribution and abundance, threats, reproductive biology (use of artificial spawning substrates, such as ceramic tiles, have been found to enhance reproduction), and increased efforts to work cooperatively with landowners to restore habitat and reduce impacts through better land use practices (e.g., Partners for Fish and Wildlife projects).

Distribution: Endemic to the Bayou du Chien drainage, a direct tributary of the Mississippi River, in extreme southwestern Kentucky. It is currently known from 16 sites in five streams in the upper half of Bayou du Chien drainage.

Abundance: Rare, population size estimated as 9,533–31,293 individuals occupying 47 km (29.3 mi.) of stream. Current population size and abundance estimates are unknown.

Threats: Extremely small native range and population fragmentation resulting from habitat deterioration increases vulnerability to extinction. Current regulatory mechanisms have been inadequate to prevent negative impacts to existing populations from channelization, riparian vegetation removal, siltation from poor land-use practices, drainage of riparian wetlands, and pollutants from municipal wastewater plants, resource extraction activities, and agricultural livestock operations. Low abundance levels make populations more vulnerable to extirpation from toxic chemical spills, habitat modification, siltation and nonpoint-source pollution.

Proposed Conservation Actions:

1. Continue to protect, restore, and enhance habitat quality throughout the drainage through cooperative efforts by federal, state, and private parties, especially in areas where reproduction has been documented (e.g., Jackson Creek).
2. Complete new survey of Bayou du Chien drainage to determine current status and distribution of the relict darter and associated fish species.
3. Evaluate genetic exchange between populations and genetic variation within populations to assess long-term viability of the species.
4. Determine habitat preferences and movements of larvae and juveniles.
5. Further explore the use of artificial spawning substrates (ceramic tiles, etc.) to enhance reproduction.

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***Etheostoma rubrum* – Bayou Darter**

Background: The bayou darter only reaches a maximum size of 2.2 in (57 mm). It was described in 1966 and was listed as Threatened in 1975. It is designated as Endangered by the state of Mississippi. A revised recovery plan was approved in 1989. Previous conservation actions include status surveys, population estimates, conservation genetics, and studies focusing on basic life history of the species.

Distribution: The bayou darter inhabits 50 km of Bayou Pierre and lower sections of its major tributaries in southwest Mississippi. The species tends to not occur in headwater reaches.

Abundance: Population densities near active erosional zones (headcutting) range from 3–10 individuals/m², but most sites with darters support less than 1 individual/m².

Threats: Extremely small native range and population fragmentation resulting from headcutting increases vulnerability to extinction. Bayou Pierre is experiencing accelerated erosion in the form of headcutting as the system stabilizes from downstream channel modifications (e.g., meander cutoffs, channelization, in-stream/bankside gravel mining). The bayou darter has moved upstream following the zone of active erosion in response to development of upstream riffle habitat. Once the headcutting cycle reaches the headwaters, however, it is uncertain how much suitable habitat will remain in the stream. While headcutting results in the creation of upstream riffle habitat, it also promotes sedimentation of suitable downstream habitat. The bayou darter continues to persist downstream of the active headcut, but in low numbers.

Proposed Conservation Actions:

1. Reduction and/or cessation of activities that exacerbate headcut formation
2. Continue promoting landowner cooperation by negotiating cooperative agreements with local managing entities (board of supervisors, private landowners, timber companies, highway departments; non-government organizations) to reduce erosion within the system by establishing conservation easements, streamside buffer zones and implementing bank stabilization programs to restore previously damaged areas. Some examples of these efforts include establishing Partners for Fish and Wildlife agreements with local landowners for small-scale bank stabilization projects; continued dialogue between USFWS and private timber companies concerning the importance of watershed conservation on their land; and providing recommendations for bank stabilization projects in proximity to the Bayou Pierre watershed.
3. Restrictions on gravel mining in or near Bayou Pierre should be implemented and enforced.

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***Percina aurora* – Pearl Darter**

Background: The Pearl darter is a small darter species reaching a maximum size of 2.4 in [60 mm] standard length. It was described in 1994 and listed as a Candidate for federal protection in 1999. It is designated as Endangered by the state of Mississippi. Previous conservation actions include status surveys, conservation genetics, and studies focusing on captive propagation.

Distribution: The species is historically known only from the Pearl and Pascagoula River drainages in south-central and southeastern Mississippi and extreme eastern Louisiana. The species has not been taken in the Pearl River since 1973 and is considered extirpated from that system.

Abundance: The species is uncommon and rarely encountered in routine sampling. In targeted sampling it has been collected in abundances as high as 58 individuals per day in the Pearl River and 32 individuals per day in the Pascagoula River. No population estimates available.

Threats: The species persists only in the Pascagoula River system and thus occupies less than 50% of its former range. It depends on mainstem portions of rivers, and its demise in the Pearl River was likely the result of completion of Ross Barnett Reservoir, which caused instability in the lower Pearl River, and low sill dams constructed to serve the West Pearl Navigation Waterway, which blocked migration to upstream spawning areas. The Pearl darter is vulnerable to nonpoint-source pollution, urbanization, and changes in river geomorphology due to its localized distribution. Increased urban and commercial development within the Pascagoula watershed will increased runoff, sedimentation, and water withdrawal and discharge from the waterway.

Proposed Conservation Actions:

1. Investigate geomorphic changes in the Pearl and Pascagoula river systems and the relationship of these changes in the Pearl River to Ross Barnett Reservoir and flow regime changes in the West Pearl River. Explore conservation advantages of removing low sill dams associated with the defunct West Pearl Navigation Waterway.
2. Continue developing protocols for captive rearing, including thermal tolerances and survivorship. The USFWS initiated a propagation program for this species with Conservation Fisheries, Inc., in 2003 but the program has been met with limited success.
3. Develop a more integrated program demonstrating the importance of maintaining natural hydrologic regimes and adequate bankside vegetation the Pearl and Pascagoula Rivers in partnership with the Pascagoula River Watershed Team, the US Army Corps of Engineers, the Pearl River Water Management District, and The Nature Conservancy.

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***Percina jenkinsi* – Conasauga Logperch**

Background: This long, tiger-striped darter (maximum size 4.6 in [116 mm]) was first captured in 1969 and described in 1985. It was listed as federally Endangered with critical habitat designated in 1985. A recovery plan was completed in 1986. The Conasauga logperch is designated as Endangered in Georgia and Tennessee. Previous conservation efforts have largely focused on habitat restoration with cooperative landowners, including stream bank restoration and installing riparian buffers. Captive propagation was attempted by Conservation Fisheries, Inc. in 2002, but initial efforts were unsuccessful. Ongoing efforts funded by USFWS, US Forest Service, and US Geological Survey include a study of conservation genetics, surveys to estimate occupancy and detection, and water quality monitoring in the Conasauga River.

Distribution: Restricted to 55 river km of the mainstem Conasauga River (Coosa River system of the Mobile Basin) in northwestern Georgia and southeastern Tennessee.

Abundance: The best available estimate suggests a population size of 200 adults. Over the past 20 years, numbers observed at historic localities have consistently declined, and some localities are no longer being occupied by the species.

Threats: Extremely small native range increases its vulnerability to extinction. Poor agricultural practices have led to sedimentation, nutrient enrichment, and pesticide runoff, resulting in a decline in the water quality. Conasauga logperch are particularly susceptible to siltation, which interferes with their feeding mode of flipping rocks during foraging. Recent flooding and drought events have further jeopardized this species, and increasing suburban development with competing demands for water pose future threats.

Proposed Conservation Actions:

1. Riparian buffers should be installed to filter agricultural runoff and fencing erected to prevent livestock entering the river..
2. The cause of the recent declines in aquatic vegetation, particularly river weed (*Podostemum*), must be studied and reversed.
3. Educational programs on ways to minimize stressors to the Conasauga River should be increased for landowners, government officials, and students.
4. Pilot captive propagation projects need to continue for ark populations or augmentation. Captive propagation must be done in conjunction with genetic analyses due to the small population size of the species.
5. Continue meetings with local government officials to develop ordinances and guidelines to minimize the impact of future urbanization on the river.

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***Elassoma alabamae* – Spring Pygmy Sunfish**

Background: In 1938 the only known population of spring pygmy sunfish (Cave Spring, Lauderdale Co., AL) was extirpated formation of Pickwick Reservoir. Another population discovered in 1941 at Pryor Spring (Limestone Co., AL) was extirpated by 1945 from aquatic herbicide treatment. The species was thought extinct until its rediscovery in Beaverdam Creek (Limestone Co., AL) in 1973. It was proposed for federal listing in 1979, but the proposal was never finalized. This species was described in 1993. It is state protected and considered a species of Highest Conservation Concern in Alabama.

Distribution: A single population occupies a five-mile stretch of Beaverdam Creek in north-central Alabama. In the mid 1980s populations were re-established in two spring pools at Pryor Branch, but suffer from groundwater withdraw, herbicide application, and inbreeding.

Abundance: Rare and localized, may exceed 1 fish per cubic meter in optimal habitat of shallow vegetated areas of spring pools, but low densities elsewhere in Beaverdam Creek

Threats: Extremely small native range and spring specialization increases vulnerability to extinction. Chronic drought and increased irrigation has reduced spring flows and killed shoreline aquatic vegetation, critical habitat for this species. Of seven spring pools occupied by the species, five are pumped for irrigation, and three were completely drained in 2007. Rapid industrial and suburban growth threatens Beaverdam Creek with contamination, further groundwater withdraw, disruption of aquifer recharge, impervious surface runoff, and sedimentation.

Proposed Conservation Actions:

In early 2008 a conservation summit was hosted by USFWS for the spring pygmy sunfish. The conservation actions below are derived, in part, from a list of priorities produced at that meeting.

1. Purchase of property within the watershed and recharge area, especially within 150 feet of spring pools, wetlands, and spring runs.
2. Establish a water resource management plan for Beaverdam Creek, which regulates and schedules all municipal and agricultural withdraw of surface and groundwater within the watershed and aquifer, and monitors groundwater levels and chemistry, with the ultimate goal of maintaining acceptable spring flow and minimum water levels in spring pools.
3. Determine the recharge area of the local aquifer.
4. Develop a regulation that limits the amount of impervious surface over the recharge zone, and identifies appropriate riparian buffers (300 feet) surrounding Beaverdam Creek and all confluent spring pools.
5. Continue to develop captive husbandry protocol in collaboration with Conservation Fisheries International, the Alabama Aquatic Biodiversity Center, and/or Riverbanks Aquarium in Columbia, SC.

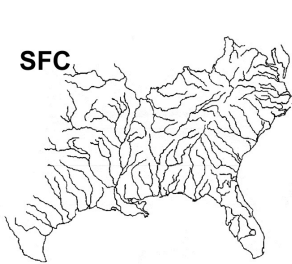
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ABOUT THE SOUTHEASTERN FISHES COUNCIL

The Southeastern Fishes Council is a nonprofit scientific organization dedicated to the study and conservation of freshwater and coastal fishes of the southeastern United States. The SFC was formed in 1975 by a group of scientists concerned with increasing environmental threats to rivers of the Southeast, and long-term protection of the southeastern fish fauna. The SFC published peer-reviewed scientific papers, regional reports, announcements, and other news in a biannual Proceedings that is distributed to dues-paying members. For more information about the SFC, please visit our website: <http://www.flmnh.ufl.edu/fish/organizations/SFC/SFCDefault.htm>

Table 1. Distribution data and abundance for the Desperate Dozen.

Species	State (current)	State (historical)	Habitat	Narrow endemic	Once widely distributed	Abundance
Alabama sturgeon	AL	MS	Big river		Yes	2 individuals seen in last 9 yrs
Slender chub	TN, VA		River		Yes	1 individual seen in last 21 yrs
Chucky madtom	TN	AL?	Small creek		Yes	3 individuals seen in last 14 yrs
Alabama cavefish	AL		Cave	Yes		Fewer than 100 individuals
Pygmy sculpin	AL		Spring	Yes		27,500 individuals
Diamond darter	WV	KY, OH	Big river		Yes	16 individuals seen in 28 yrs
Vermilion darter	AL		Small creek	Yes		1,667 to 2,919 individuals
Relict darter	KY		Small creek	Yes		9,533 to 31,293 individuals
Bayou darter	MS		River	Yes		Most sites < 1 individual per m ²
Pearl darter	MS	LA	Big River		Yes	No estimates
Conasauga logperch	TN, GA		River	Yes		200 individuals
Spring pygmy sunfish	AL		Spring	Yes		No estimates

Table 2. Threats to the Desperate Dozen.

Species	Threat 1	Threat 2	Threat 3
Alabama sturgeon	Habitat alteration - dams & dredging	Historical overharvest	
Slender chub	Reduce range	Water pollution - industrial & agricultural	
Chucky madtom	Small range	Water pollution - agricultural	
Alabama cavefish	Small range & specialization	Aquifer reduction & pollution	
Pygmy sculpin	Small range & specialization	Water pollution	Competition
Diamond darter	Reduce range	Habitat alteration -dams	Water pollution - sedimentation
Vermilion darter	Small range & fragmentation	Water pollution & flows - urban	
Relict darter	Small range & fragmentation	Habitat alteration - channelization	Water pollution
Bayou darter	Small range & fragmentation	Habitat alteration - head cutting	
Pearl darter	Habitat alteration -dams	Water pollution - urban & industry	
Conasauga logperch	Water pollution – agriculture and siltation	Small range	
Spring pygmy sunfish	Small range & specialization	Aquifer reduction	Water pollution

Table 3. Proposed conservation actions (PCA) for the Desperate Dozen.

Species	1st PCA	2nd PCA	3rd PCA	4th PCA	5th PCA
Alabama sturgeon	Tracking	Propagation	Fish passage	Water quality	Protect habitat
Slender chub	Survey abundance	Cause of decline	Propagation	Genetics	Life history data
Chucky madtom	Watershed plan	Propagation	Survey		
Alabama cavefish	Watershed plan	Survey abundance/ monitor water quality	Life history info	Survey	
Pygmy sculpin	Decontaminate watershed	Monitor water quality	Survey abundance	Survey competitors	
Diamond darter	Survey abundance	Search additional pops	Propagation		
Vermilion darter	Watershed plan	Survey abundance/ monitor water quality	Life history info	Habitat restoration	
Relict darter	Watershed plan	Survey abundance	Genetics	Life history data	Spawning techniques
Bayou darter	Habitat restoration	Watershed plan	Restrict gravel mining		
Pearl darter	Habitat restoration	Propagation	Watershed plan		
Conasauga logperch	Habitat restoration	Address aquatic vegetation decline	Watershed plan	Propagation/Genetics	Restrict impacts
Spring pygmy sunfish	Purchase property	Watershed plan	Determine recharge area	Limit impervious surfaces	Propagation

Table 4. Year of species description, current status of federal protection (candidate, threatened, or endangered), status of critical habitat, recovery plan, and 5-year reviews, and imperiled status in conservation publications for the Desperate Dozen.

Species	Year Described	C	T	E	Critical Habitat	Recovery Plan	5-year Review	Warren et al. 2000	Jelks et al. 2008
Alabama sturgeon	1991			2000	2008 proposed	NO	NO	E	E
Slender chub	1956		1977		1977	1983	2008	E	E
Chucky madtom	2005	2002						T	E
Alabama cavefish	1974		1977	1988	1977	1990	NO	E	E
Pygmy sculpin	1968		1989		NO	1991	2008	E	E
Diamond darter	2008							T	E
Vermilion darter	1992			2001	NO	2007	2008	E	E
Relict darter	1992			1993	NO	1994 draft	2007	E	E
Bayou darter	1966		1975		NO	1990	2006	E	E
Pearl darter	1994	1999						E	E
Conasauga logperch	1985			1985	1985	1986	2005	E	E
Spring pygmy sunfish	1993							E	E