Common Name: EASTERN HELLBENDER

Scientific Name: *Cryptobranchus alleganiensis alleganiensis* Daudin

Other Commonly Used Names: none

Previously Used Scientific Names: none

Family: Cryptobranchidae

Rarity Ranks: G3G4/S2

State Legal Status: Threatened

Federal Legal Status: none

Description: The hellbender is an extremely large, fully aquatic salamander typically ranging 29-51 cm (11½ - 20 in) in total length, though some individuals may reach 74 cm (29 inches). The body and broad head of this species are flattened, while the rudder-like tail is laterally compressed. Tiny, widely separated eyes are located on top of the head. Both the front and hind limbs are short, stout, and posteriorly keeled. A conspicuous lateral, wrinkly skin fold extends down both sides between the front and hind limbs. The body is yellowish brown, reddish brown, or dark brown in color, with dark irregular blotches or mottling. The venter is typically paler with little or no markings. A single pair of gill slits is present, though gills are lacking in adults. Young have a pair of gills that typically are lost upon reaching 10-13 cm (4-5 inches) in total length; otherwise, they are similar to adults.

Similar Species: The mudpuppy (*Necturus maculosus*) shares habitat and range with the hellbender and may be confused with it. Mudpuppies have external gills throughout life, only four toes on each hind foot, and lack folds of skin along the sides.

Habitat: Streams harboring hellbenders are typically clear, cool, and swiftly flowing with rocky bottoms. Although small streams may be inhabited, those with widths greater than 5 m (16 ft) seem to provide more suitable conditions.

Diet: Hellbenders feed almost entirely on crayfish, but they may also take small fish, snails, frogs, snakes, small mammals. Cannibalism of eggs and larvae has been documented.

Life History: These enormous salamanders require an abundance of flat, submerged rocks for both shelter and egg deposition. During late summer, males begin excavating saucer-shaped depressions under flat rocks. Females attracted or lured to these nests deposit from 450 to nearly 1,100 eggs in a single compact cluster, the eggs strung together in a fashion similar in appearance to a pearl necklace. Occasionally, several females will oviposit in the same nest. Following external fertilization of the deposited eggs, the male guards the clutch from potential predators until hatching, which occurs two to three months later. Freshly deposited eggs have been observed as late as early October. Hellbenders are primarily nocturnal, rarely leaving their submerged shelter until after dark. Foraging is typically restricted within a relatively small home range, which was recorded in Pennsylvania to average 364 sq m (435 sq yd).

Survey Recommendations: Hellbenders are most easily found by lifting large, flat rocks and looking underneath. Individuals emerge from rock shelters during the evening and, with the aid of a flashlight, can be observed while foraging. Hellbenders can be found throughout the year, but most surveys take place in the warmer months.

Range: Southern New York southward to northeastern Mississippi, with a disjunct population in central Missouri. In Georgia, this species is known only from streams and rivers of the Tennessee River drainage in the Cumberland Plateau, Ridge and Valley, and Blue Ridge physiographic provinces.

Threats: The deteriorating quality of habitat resulting from stream impoundment, chemical pollution from agricultural and industrial runoff, and siltation originating from adjacent land disturbance is the biggest threat to the hellbender throughout its range. Stream impoundment and thus decreased water flow reduce the dissolved oxygen content necessary for efficient respiration of all stream fauna which do not breathe air. Because hellbenders breathe almost exclusively through their skin, toxic chemicals introduced into streams may become absorbed in their bodies. Acid rain may be another agent of chemical pollution threatening this species. In addition, sedimentation often creates unsuitable habitat by plugging the gaps beneath rocks used for shelter and breeding; suffocation of eggs may occur as a result of persistent sediment influxes. The extent to which local populations in Georgia have been impacted by over-collection is unknown. Anglers who catch hellbenders while in pursuit of sport fish sometimes kill them out of spite, fear, or the erroneous belief that they impact trout populations. Ironically, trout anglers would reasonably be one of this species' best allies since stream impacts that harm the hellbender typically also harm the trout fishery. The introduction of liquid bleach into streams to collect bait salamanders ("spring lizards") is a technique that likely threatens all aquatic life in localized areas, including hellbenders and their prey. A 2005 survey of all historic hellbender streams in Georgia found them to be absent at 38% of the sites they were originally reported from. Of the

historic streams that still contain hellbenders at the original reporting sites, 31% were considered "unhealthy," that is, they are not likely to support long-term, viable populations of this species.

Georgia Conservation Status: Populations occur in many streams within the Chattahoochee National Forest, but few if any of these drainages are unaffected by disturbances originating on adjacent or upstream private lands.

Conservation and Management Recommendations: Forested buffer strips adjacent to streams containing hellbender populations should be left intact or be restored to reduce the amount of chemical runoff and siltation reaching the streams, and to shade and cool the streams. Impoundment, channelization, and stream diversion should be avoided in these streams. Increased law enforcement efforts may be warranted at the better known hellbender streams in Georgia.

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J. Jensen and J. Humphries, Dec. 2007: original account
K. Owers, Sept. 2009: updated status and ranks, added picture


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