

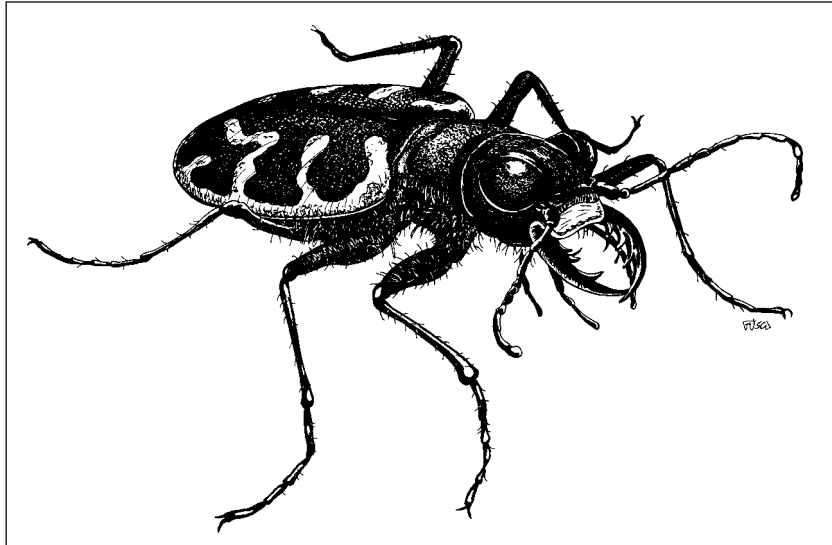
WILDLIFE IN CONNECTICUT

ENDANGERED AND THREATENED SPECIES SERIES

PURITAN TIGER BEETLE

Cicindela puritana

ENDANGERED



Habitat: In New England, sandy beach habitat along the Connecticut River. Burrows are dug in upper shoreline areas with scattered vegetation and sandy clay soils.

Length: 0.44-0.56 inches.

Life Cycle: 2 years.

Food: Small insects, especially flies and ants.

Status: Federally threatened and state endangered.

Identification: The Puritan tiger beetle is a medium-sized terrestrial beetle. It has long legs and dark bronze-brown to green wing covers with cream-colored markings on the upper surface. This beetle often occurs with the more common *Cicindela repanda*, which is stouter, has white markings on the wing covers that do not connect along the edges, and is metallic blue-green under the body. In contrast, the Puritan tiger beetle appears longer and thinner, has whitish markings that connect along the outer margins of the wing covers, and has white hairs on the underbody. The Puritan tiger beetle appears whitish and shining in bright sunlight, while *C. repanda* is more of a chocolate brown and shows a blue flash from underneath when it flies.

Range: The Puritan tiger beetle is found only in two small areas which are separated by over 600 miles, one along the Connecticut River, in New England, and the other along the Chesapeake Bay, in Maryland. In the Connecticut River Valley, the species distribution follows the sand and clay deposits formed by glacial lakes during the last ice age.

Reproduction: The Puritan tiger beetle emerges from the pupal stage as an adult in late June. Mating begins in mid-July and may continue until mid-August, when the adults start to die off. Females have been observed mating with more than one male and placing their eggs singly, just below the surface of the sand among scattered plants. After about a week, the eggs hatch into larvae about one-third of an inch long. The larvae dig a burrow an inch or two deep in the sand. They sit on top of the burrow, blocking the entrance with their large heads, and wait for prey, which they capture with their sickle-like mandibles (the principal jaws). After 2 to 4 weeks, the larvae molt into a slightly larger second stage, which dig deeper into the burrow, about 1.5 to 2 feet. By late October, these second-stage larvae close their burrows for the first of their two winter hibernations. In April or early May of the next spring, they open their holes and are active for a month or two, then close their burrows again until early September, when they molt to the third and final larval stage. These larvae remain active until late fall when they close their burrows for

their second winter. The following spring, they are active until about June, when they pupate and transform into adults. The adult beetles then emerge from their burrows and begin the cycle again.

Reason for Decline: Puritan tiger beetle populations are limited by the availability of sandy beach habitat along rivers, which tends to occur below large river bends. Some historical sites where beetles occurred have been lost to bank stabilization around cities and by habitat loss due to flooding behind dams. The operation of flood control and hydroelectric dams has changed the way rivers flow and flood, possibly affecting the forces which create and maintain river beaches. At least one site, in Massachusetts, appears to be threatened by heavy recreational use.

History in Connecticut: The Puritan tiger beetle was collected in several towns from Middletown to the Massachusetts border in the late 1800s and early 1900s. Presently, they are found at a single cluster of 3 small sites. The total population in New England is less than 1,000; more than 99 percent of the remaining New England population is found only in Connecticut.

Interesting Facts: Like many insects, the Puritan tiger beetle has a complex life history. The immature stages look and act very differently from the adult. The adults are typical tiger beetles, active primarily on sunny days. They are long-legged predators which hunt by running along the sand, capturing small insects in their sharp, toothed jaws. In turn, they are preyed upon by dragonflies and robber flies. Puritan tiger beetles go through bursts of foraging activity, alternating with periods of standing still. The beetles' markings and color are cryptic, making them very difficult to spot if they are not moving. The larvae, in contrast, are somewhat like thin white caterpillars and are sit-and-wait predators. They almost never emerge from their vertical burrows. As the larvae move up and down their burrows, they

smooth out the top of the hole, making it very round so that it almost appears to have been made by a drill. After rain or high water, they use their wide, flat heads like shovels to clear out sand that has fallen into their holes. Larvae have hooks on the backs of one of their body segments, so that their predators find it difficult to pull them out of their burrows.

The Puritan tiger beetle leads a life of remarkable contrasts. It depends on areas which are disturbed enough to remain relatively open and free of plant cover, but not so disturbed that they wash away. Their habitat can be covered by floods in almost any month of the year, and larvae often spend a month or more under the water during spring floods. During the summer months, adults are active, but larvae close their holes and are inactive. This is probably to avoid parasitism by flies and wasps, which try to lay eggs on the larvae or drop their eggs down the larval hole. The parasitoid eggs, if successful, will hatch into larvae that attach to the back of the tiger beetle larva and eat it alive, eventually emerging from the burrow as an adult wasp or fly.

Although some other tiger beetles take only one year to develop, the Puritan tiger beetle takes two years, running the risk of being washed away by two successive years of spring floods. The beaches and banks of the Connecticut River are an unusual and rare habitat, and the Puritan tiger beetle has adapted to these unique challenges.

Protective Legislation: *Federal* - Endangered Species Act of 1973. *State* - Connecticut General Statutes Sec. 26-311.

What You Can Do: Plants and animals which live on beaches are under great pressure from development and recreation. Remember that the beach you are on may be some creature's living room--tread softly and treat it with respect.

CONNECTICUT RANGE

