ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code: IICOL02282**
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Cicindela purpurea cimarrona*
COMMON NAME: A Tiger Beetle
SYNONYMS:
FAMILY: Cicindelidae

AUTHOR, PLACE OF PUBLICATION: Oliver, 1790.

TYPE LOCALITY:

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: Specimens of *Cicindela purpurea* from Arizona are usually referred to as *cimarrona*, although no convincing argument has been made yet that they are reproductively isolated from the main range of *purpurea*. (Kim Wismann, pers. comm., in Brock and Prchal 2001).

DESCRIPTION: The larvae are elongate, cylindrical, and somewhat grub-like. The mandibles are powerful and curve upwards. The head and prothorax are fused and rounded, forming a circular plate. The head is held at nearly a right angle to the axis of the body. The fifth abdominal segment has a tergal hump bearing anteriorly curved spines. (Brock and Prchal 2001).

For the genus: Adult tiger beetles are generally slender, long-legged insects, with most species having a body length of about 10-15 mm, but some are as small as 6 mm and as large as 32 mm. They are predatory and accordingly are adapted with large sickle-like mandibles and usually bulging eyes. (G. Dunn's web site).

AIDS TO IDENTIFICATION: Like many grassland species, *purpurea* may take flight when pestered enough, making positive ID difficult. See illustrations for variability in *Cicindela purpurea*.

ILLUSTRATIONS: Color photos by Chip Hedgcock, Steve Marshall
(http://woodland.bio.ic.ac.uk/research/tigerb/rangepaper.ht)
Generic larva illustration, from Gary Dunn's
(http://members.aol.com/YESedu/ecologyt.html)

TOTAL RANGE: Cicindela purpurea ranges across the entire United States, and has been described at some localities as subspecies. (Brock and Prchal 2001).

RANGE WITHIN ARIZONA:

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Tiger beetles have three larval instars. Upon hatching from the egg the first instar larva proceeds to enlarge the impression made by the female's ovipositor into a burrow. As the larva grows the burrow is enlarged.

Larval burrows of the tiger beetles are very characteristic. The entrance to the burrow is flush with the surface of the ground, and is clean and smooth. There is no "cone" of soil particles, as the larvae toss this material as far away from the burrow as possible. Most burrows are constructed so that they are perpendicular to the soil surface. However, there is considerable variation among individuals and species. The burrow depth varies greatly, although it does seem to be correlated to geographic location. Those in northern regions tend to be deeper. Most burrow construction takes place at night. (Gary Dunn's website).

For the genus: Most species are active on warm, sunny days, and they run in short spurts on their long legs. Activity of the adult beetles is regulated by air temperature, humidity (actual evaporation), light intensity, and wind. Most species do not become fully active until the air temperature reaches about 15 degrees C. Adult beetles burrow in the soil to pass the night and to escape unfavorable weather, wither hot and dry or cold and wet. They also burrow rather deeply in preparation for winter dispause. Most species are able to fly well, but they usually fly only when disturbed by a larger animal. Because of their active running and flying habits, most cicindelids are found on bare areas with little or no vegetation to get in their way. Adult natural enemies include various insect-eating animals, mainly insectivorous birds and larger insects (robber flies, dragonflies, etc.). Larvae are parasitized by larvae of certain bee flies (Bombyliidae) and a type of wasp (Tiphiidae). Probably man is their worst enemy, since they are readily killed by insecticides and such disturbances as dune buggies and dam building. (Gary Dunn's web site).

REPRODUCTION: Selection of the breeding, or larval, habitat is a critical task left up to the adult female during oviposition. Because the larvae are relatively immobile and the habitat requirements are more circumscribed than that of adults, the availability of larval habitat is often the limiting factor that controls the population levels of the beetles. When an area of larval habitat becomes endangered and disappears, so does the species it supports. (Brock and Prchal 2001).

Copulation generally occurs on warm days with high humidity. After mating, the eggs are deposition singly in the soil, each in a small indentation created by the female's ovipositor. Part of the ninth and all of the tenth abdominal segments of the female are covered with hairs sensitive to conditions of soil moisture and structure. The female carefully selects the proper soil type before finally ovipositing. Survival of the larva is dependent upon this choice. (Gary Dunn's website).

FOOD HABITS: Cicindelidae in general feed on other insects and sometimes pounce on prey quite suddenly. *C. purpurea cimerrona* not specifically mentioned regarding food habits.

HABITAT: *C. purpurea* is a dispersed high elevation grassland and prairie species in Arizona, although it inhabits lower elevations elsewhere. In Arizona, lower elevations just don't hold enough moisture to support *purpurea* reliably, although it probably uses lower elevations in wet years. Practice looking for adults on Mt. Graham, along trails at upper elevations, especially trails through grassy areas. Nominate *purpurea* likes clay soils but most of the elevations in Arizona that support it are composed of volcanic dust and cinders, so it has likely made some adaptations in our area. (Kim Wismann, pers. comm., in Brock and Prchal 2001).

ELEVATION: see **Habitat**

PLANT COMMUNITY:

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None
STATE STATUS: None
OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)

MANAGEMENT FACTORS:

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP:

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

Brock, J. and S. Prchal. 2001. Sensitive Insect Species of the Coronado National Forest. A Training Project by Sonoran Arthropod Studies Institute, Tucson, AZ.

Dunn, G. http://members.aol.com/yesedu/cicindel.html.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

Wismann, Kim, Pers. Comm., in Brock and Prchal, 2001.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

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http://woodland.bio.ic.ac.uk/research/tigerb/rangepaper.htm (Maps).

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ADDITIONAL INFORMATION:

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