ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IICOL59010
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Cylloepus parkeri* (Sanderson)
COMMON NAME: Parker's Cylloepus Riffle Beetle
SYNONYMS:
FAMILY: Elmidae

AUTHOR, PLACE OF PUBLICATION: M.W. Sanderson. 1953. New species and a new genus of New World Elmidae with supplemental keys. The Coleopterists' Bulletin 7:33-40.

TYPE LOCALITY: Bloody Basin, Yavapai County, Arizona. 8 June 1947.

TYPE SPECIMEN: Carnegie Museum of Natural History (CMNH), F.H. Parker, 8 June 1947. No collection numbers given. Brown (1983) reports "Type" as and adult male deposited at INHS.

TAXONOMIC UNIQUENESS: Location. Found only in Bloody Basin area.

DESCRIPTION: *C. parkeri* in adult stage is a very small, black (sometimes with large reddish spots on elytra), non-swimming beetle living on rocks, sand and gravel in riffles. Body is cylindrical, legs long with large claws, and moderately long antennae. Adults range in size from 2.15-2.75 mm long and 0.85-1.1 mm wide. Larvae are very small, brown, hard, elongate, and roughly triangular in cross section; about 6.0 mm long and live in riffles. The body is NOT covered in dense, short hair.

For riffle beetles in general, the body is usually dark brown or red-brown, with color patterns or various metallic tints. There are numerous longitudinal rows of very small indentations, such as would be made by the point of a needle, on the hardened front of the wings. The antennae ranges from 1-8 mm. In general for the larvae, the body length is usually 3-8 mm and may range up to 16 mm. The body is elongate, cylindrical and hard. They are usually dark brown or red-brown. The legs have four segments (not counting the claws). There is one claw on the end of each leg. The abdomen has nine segments. Abdomen segment nine has a cavity that is covered by a hinged lid, and there is a tuft of filamentous gills that can be withdrawn into this cavity (Voshell 2002).

AIDS TO IDENTIFICATION: Black with two large reddish spots on each elytron or wing covers.

ILLUSTRATIONS: Color photos (Palmer 1992)
Black & White drawing (Borror 1970)
Black & White drawing (Warrick 1986)
Color drawing of adult and larvae (Voshell 2002)

TOTAL RANGE: According to McKown, only known habitat for *C. parkeri* occurs Yavapai County, Arizona, in spring fed Roundtree Canyon in Bloody Basin within the Tonto National Forest. R. Johnson (1992) states that it also occurs in Tangle Creek, also located in Bloody Basin.

RANGE WITHIN ARIZONA: See "**Total Range.**"

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Little is known of life history or ecology of *C. parkeri* Sanderson, but it is believed to be similar to other species of riffle beetles. Apparently distribution is highly localized suggesting to Johnson (1992) that newly emerged adults do not fly. Mature larvae pupate outside water in moist soil along stream's edge. Although aquatic, *C. parkeri* does not swim, but crawls about slowly on underwater plants or debris. Riffle beetles are efficient clingers by virtue of their long, sharp claws at the end of the legs and their small, compact, hard bodies.

Riffle beetle larvae breathe dissolved oxygen with gills that are on the end of their abdomen in a pocket with a door. They protrude the gills out in the water and wave them to obtain dissolved oxygen. They withdraw the gills into the pocket in their abdomen and close the door to protect them from abrasion by sediment carried in the moving water. Adult riffle beetles breathe by means of a highly developed plastron, with microscopic length hairs as dense as several million per square millimeter of body surface. This plastron is so efficient that most riffle beetle adults never have to come to the surface for air again after they enter the water. Most riffle beetles require a lot of oxygen and are only found in waters with dissolved oxygen at or near the saturation point.

Larvae are different from most other kinds of water beetles because riffle beetle larvae shed their skin six to eight times, instead of the usual three times. Most riffle beetles spend 1 or 2 years as larvae, but some species take up to three years to complete the larval stage. Newly emerged adult riffle beetles undergo a short flight period, but after they enter the water they lose the ability to fly. The unneeded hind wings progressively waste away by some unknown process. Adult life spans are not known, but riffle beetle adults are thought to be long lived. It is speculated that some species do not reach sexual maturity until their second year of adult life, and some may live on into a third year (Voshell 2002).

REPRODUCTION: Riffle beetles typically deposit eggs on the underside of submerged rocks and debris.

FOOD HABITS: Both adults and larvae feed on periphyton, algae, moss and vegetable material.

HABITAT: Permanent, clean, slow moving small streams, with loose gravelly substrate and very little sand.

ELEVATION: 2,850 - 4,000 ft. (869 - 1,220 m).

PLANT COMMUNITY: Juniper, catclaw, Mimosa, and prickly pear occur on canyon slopes. Riparian vegetation includes sycamore, ash, willow, and cockleburrs. Aquatic flora consists of watercress growing in a bed of various sizes of rock and gravel with very little sand.

POPULATION TRENDS: Unknown

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]
[C2 USDI, FWS 1989]

STATE STATUS:

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
[Forest Service Sensitive, USDA, FS Region 3 1988]

MANAGEMENT FACTORS: *C. parkeri* requires water very high in oxygen content. This factor greatly restricts distribution. High sensitivity to pollutants is good measure of water quality. Activities such as mining, stream channelization, and heavy grazing would almost certainly be detrimental to this beetle.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Because little is known about this riffle beetle, little can be done except protection of known sites of occurrence and determination of the exact range on a national level. Taxonomic investigations should be done.

LAND MANAGEMENT/OWNERSHIP: USFS - Tonto National Forest and possibly Prescott National Forest.

SOURCES OF FURTHER INFORMATION

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White, R.E. 1983. A field guide to the beetles. Houghton Mifflin Co. Boston.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

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Milton Sanderson - Retired, New Mexico

Greg Warrick - Prescott National Forest, Prescott, Arizona.

ADDITIONAL INFORMATION:

Revised: 1992-01-21 (JSP)
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