Cicindela columbica (Hatch, 1938)
Columbia River tiger beetle
Coleoptera: Cicindelidae

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SUMMARY

Cicindela columbica was described as a new species from larvae collected at the type locality in Perry, Washington. It inhabits river sandbars and riparian sand dunes along the Columbia, Snake, and Salmon Rivers. It was known historically from Idaho, Oregon, and Washington, but is thought to have been extirpated from Oregon and Washington following damming of the Columbia River. The Columbia River tiger beetle is currently known only from a few sites in the Snake River drainage in Idaho. This species has narrow habitat requirements and may be threatened by damming, trampling of habitat by humans, livestock and vehicular traffic, and by tiger beetle collectors in search of rare specimens. Research should focus on assessing management of existing habitat, identifying potential habitat in or adjacent to known sites in Idaho and investigating the dispersal and colonization ability of this species.

CONSERVATION STATUS

Rankings:
Canada – Species at Risk Act: N/A
Canada – provincial status: N/A
Mexico: N/A
USA – Endangered Species Act: N/A
USA – state status: Idaho S1 Critically imperiled; Oregon & Washington SH Presumed extirpated
NatureServe: G2 Imperiled
IUCN Red List: VU Vulnerable

SPECIES PROFILE

DESCRIPTION

Cicindela columbica is in the family Cicindelidae (tiger beetles). Adults are 12-14 mm (0.47-0.55 in.) long, with an iridescent black body, metallic bronze elytra with pale wavy markings, and long slender antennae and legs. The head is dark with prominent eyes and large sickle-shaped mouthparts; the head and eyes together are wider than the thorax. The legs, thorax and head are pubescent (hairy).

Tiger beetle larvae live in burrows in the sand. Larvae hide at the mouth of the burrow and seize passing prey with large sickle-shaped mandibles.

TAXONOMIC STATUS

Cicindela columbica Hatch 1938. The taxonomic status of this species is accepted as valid.

LIFE HISTORY

Cicindela columbica populations have been found exclusively on sandbars and sand dunes in riparian areas of large lowland streams (Shook 1981; LaBonte 1995). Surveys on the lower Salmon River found this species in greater abundance on older, extensive, well-established sandbars that extended far enough back from the river (>100m; 3937 ft.) to avoid being flooded by spring runoff (Shook 1981). Larvae can survive short periods of inundation, possibly by using air trapped in their burrows, but are likely to die if washed out (Pearson 1988).

Females lay eggs in small holes dug into sandy soil moistened by a nearby stream or river. As larvae grow and molt through three successive instars, they enlarge their burrows by loosening the soil with their mandibles and moving it by using their head and thorax as a shovel (Pearson, 1988). Larvae appear to be intolerant of variations in soil moisture, temperature, and composition. Adults have been found from mid-April to May (Leffler 1979) and in late July through early August (Shook 1981). The life cycle of tiger beetle species ranges from two to four years (Pearson 1988). It is thought that *C. columbica* has a three-year life cycle, and larvae are present in their burrows at any season.

Adults and larvae are voracious predators on other insects. Larvae use their jaws to capture prey that wander close to the mouths of their burrows. Adults are active, fast-running, strong-flying hunters that forage for prey on sandbars and dunes during the day and burrow into the sand at night.

DISTRIBUTION

Cicindela columbica is currently known only from a few sites in the Snake River drainage in Idaho. This species was first described from specimens collected in Perry, Washington (Hatch 1938), and is known historically from Washington, Oregon, and Idaho. Early distribution of *C. columbica* included sand bars from The Dalles in Oregon and eastward to Lewiston, Idaho (located between the Snake and Clearwater Rivers). However, *C. columbica* was apparently extirpated from most if not all of its habitat in Oregon and Washington following backwater flooding due to dam construction on the Columbia and Snake Rivers. Several other species of *Cicindela* tiger beetles that had been present in the same habitat prior to flooding re-established themselves on the banks of the newly-created reservoirs, but no Columbia River tiger beetles were found (Beer 1971), and mention of this species in The Tiger Beetles of Washington (Leffler & Pearson 1976) was based on existing specimens, with no observations of living populations. Populations of *C. columbica* on the lower Salmon River in Idaho are also thought to have been impacted by highway construction.

More recent surveys have found *C. columbica* populations in the lower Salmon River Canyon, from near Slate Creek to Eagle Creek (~42 km [26 mi] reach), but not on the Snake River from the mouth of the Salmon River on the Oregon-Idaho border to Heller's Bar, Washington (Shook 1981). No *C. columbica* were found on the lower Salmon River below Eagle Creek, or along the Idaho-Oregon or Idaho-Washington Snake River corridors. The largest populations on the lower Salmon were estimated to number from 200-400 beetles, but it was noted that accurate population assessments are difficult due to the active and fast-moving nature of these beetles.

THREATS

The main threats to the survival of *C. columbica* are its restricted geographic distribution, specialized habitat requirements, and habitat destruction. It may also be threatened by excessive collecting.

Previously known populations along the Columbia River in Oregon and Washington have declined sharply or been extirpated due to the effects of damming; it is thought that backwaters flooding larval habitat cause high mortality in this species. The apparent dependence of *C. columbica* on large well-established sandbars suggests that re-colonization of flooded habitats is unlikely or will be slow to occur. Large numbers of dams along the rivers where this species was once found may also fragment remaining areas of suitable potential habitat, limiting dispersal and colonization.

The lower Salmon River, where this species still persists, is a popular destination for recreational users, with extensive boating, rafting, fishing, camping, and hiking activities. Excessive foot, livestock, and/or vehicular traffic in the sandy riparian areas inhabited by *C. columbica* can seriously degrade habitat, destroying larval burrows and potentially killing young larvae.

Over-collecting has also been suggested as a potential threat to this species (LaBonte 1995). Tiger beetles are popular with collectors due to their bright metallic coloration and striking patterning, and enthusiasts are often eager to obtain a rare specimen for their collections.

Additional potential threats such as the effects of disease, predation, and loss of open sandy habitat due to encroachment by vegetation, especially invasive species, have not been assessed.

CONSERVATION STATUS

Cicindela columbica has no federal status at the present time. The U.S. Fish and Wildlife Service was petitioned by G. Shook in 1979 to list this species as Endangered or Threatened, based on the threat presented by a proposed dam on the lower Salmon River. In 1988, when the USFWS wrote its finding, this dam was no longer proposed and the petition was declared to be unwarranted. *Cicindela columbica* is ranked as a Type 2 Sensitive Species by the Bureau of Land Management, which indicates a species that is experiencing significant declines throughout its range with a high likelihood of being listed in the foreseeable future due to their rarity and/or significant endangerment factors.

CONSERVATION NEEDS

Necessary actions include monitoring known populations and searching for new ones, and protecting habitat in regions where the species is known to occur. The status and success of current management strategies to preserve remaining suitable riparian sandbars and beaches as habitat within this species' range should be investigated. Collectors should be discouraged from taking this species.

RESEARCH NEEDS

Further surveys are warranted to identify additional suitable habitat in and adjacent to the Snake River drainage in southwestern Idaho, and to obtain an accurate picture of current population

sizes and stability. This species appears to require well-established sandbars as habitat, and new surveys along suitable areas of the Columbia River in Oregon and Washington would be valuable, to determine if habitat recovery has occurred since damming in the 1970's extirpated *C. columbica* from these regions. The long-range dispersal capacity of this species should be investigated to determine the potential for *C. columbica* to colonize suitable habitat in the region. Investigation into the effectiveness of habitat management to preserve riparian sand dunes and river sandbars should be conducted.

RESOURCES

CONTACTS

Gary Shook did much formal & informal surveying and conservation work; in environmental health at Boise State (?); (208) 426-3795 or gshook@boisestate.edu *e-mailed 03/13/08*

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