

U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Cicindela limbata algissma*

COMMON NAME: Coral Pink Sand Dunes Tiger Beetle

LEAD REGION: 6

INFORMATION CURRENT AS OF: June 30, 2004

STATUS/ACTION

- ☐ Initial 12-month Petition Finding: ☐ not warranted
☐ warranted
☐ warranted but precluded (also complete (c) and (d) in section on petitioned candidate species- why action is precluded)
- ☐ Species assessment - determined species did not meet the definition of endangered or threatened under the Act and, therefore, was not elevated to Candidate status
- ☐ New candidate
- ☒ Continuing candidate
- ☐ Non-petitioned
- ☒ Petitioned - Date petition received: April 21, 1994
- ☒ 90-day positive - FR date: September 15, 1994
- ☐ 12-month warranted but precluded - FR date: _____
- ☐ Is the petition requesting a reclassification of a listed species?
- ☐ Listing priority change
- Former LP: _____
- New LP: _____
- Latest Date species became a Candidate: November 15, 1994
- ☐ Candidate removal: Former LP: _____
- ☐ A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
- ☐ F - Range is no longer a U.S. territory.
- ☐ I - Insufficient information exists on biological vulnerability and threats to support listing.
- ☐ M - Taxon mistakenly included in past notice of review.
- ☐ N - Taxon may not meet the Act's definition of "species."
- ☐ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insect, *Cicindelidae*

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Utah

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:
Kane County, Utah

LEAD REGION CONTACT: Chuck Davis, (303) 236-4523

LEAD FIELD OFFICE CONTACT: Utah Field Office, Marianne Crawford, (801) 975-3330

BIOLOGICAL INFORMATION:

The Coral Pink Sand Dunes Tiger Beetle *Cicindelidae limbata albissima* has a localized distribution at Coral Pink Sand Dunes in Kane County, Utah, and no other localities are known despite thorough searches (Hill and Knisley 1991b, Knisley and Hill 1992, 1995a). The species is restricted mostly to a relatively small part of the approximately 13-kilometer (8-mile) long dune field, situated at an elevation of about 1,820 meters (6,000 feet). The Coral Pink Sand Dunes tiger beetle is a subspecies of the tiger beetle *Cicindela limbata*. It has striking coloration; the large, wing cases (known as elytra) are predominantly white and much of the body and legs are covered in white hairs . The upper thorax has a metallic sheen and the eyes are particularly large. The three other recognized subspecies of *C. limbata* range from mid-U.S. to Canada (Hill and Knisley 1991b). The range of these four sub-species does not overlap, and they differ primarily in elytral maculation or pigmentation of the wing cases.

Adults range from the troughs between the dunes to the upper slopes, larvae are found only in the damper, and more protected furrows between the dunes. Adult Coral Pink Sand Dunes tiger beetles are active predators on the sparse dune slopes, attacking and eating prey with their large and powerful mandibles. These beetles are active in the day, preying and scavenging on live and dead insects. At night, the beetles bury into the sand dunes. When mating, the male is able to tightly clasp the female with his mandibles on grooves along her side. The larvae of this beetle are found in individual burrows within the furrows of the dune system; from here they are able to ambush small invertebrate prey. Within their burrows, the larvae may become hosts to the parasitic wasp *Methoca* sp.

Taxonomy

The subspecies was first described as *Cicindela limbata albissima* by Rumpp (1961), who distinguished it from other subspecies of *C. limbata* due to differences in pigmentation and its disjunct location over 600 kilometers (400 miles) from other population of the species (Knisley and Hill 2001). A recently completed genetic analysis of the *C. limbata* complex, based on mtDNA work, suggests that *C.l. albissima* is genetically distinct from the other subspecies and that it should be given full species status (Morgan et al. 2000). The Coral Pink Sand Dunes tiger beetle has not yet been formally described as a unique species but a publication to formalize the species designation is anticipated within the next six months (C.B. Knisley, Pers. Com. 2004).

Habitat

The Coral Pink Sand Dunes tiger beetle appears to have been isolated at a high elevation, and, like other members of the species group, is restricted to a cool, sandy habitat. The species is restricted mostly to a relatively small part of the approximately 13-kilometer (8-mile) long dune field, situated at an elevation of about 1,820 meters (5,970 feet).

Larval Coral Pink Sand Dunes tiger beetles inhabit inter-dunal swales, typically dominated by the leguminous plants *Sophora stenophylla* (silvery sophora) and *Psoraleidum lanceolatum* (dune

scurfpea), and several grasses including *Sporobolus cryptandrus* (sand dropseed) and *Stipa hymenoides* (Indian ricegrass). Swales are more productive micro-habitats than the surrounding sand dune slope habitat of the adults (Knisley and Hill 1994, 1995).

Historical and Current Range/Distribution

The Coral Pink Sand Dunes tiger beetle may be one of the world's most restricted and rare tiger beetles. It is known to occur only at Coral Pink Sand Dunes (CPSD), approximately seven miles west of Kanab, Kane County, in south-central Utah. The southern portion of the dunes is within the State of Utah's Coral Pink Sand Dunes State Park, and the northern portion is Federal land managed by Kanab Resource Area of the Bureau of Land Management (BLM). The BLM portion of the Dunes is within the Moquith Mountain Wilderness Study Area. Virtually the entire larval population of the Coral Pink Sand Dunes tiger is confined to one 800 by 300 meters (3,000 by 1,000 feet) site (Knisley and Hill 1994; C.B. Knisley, pers. Comm. 1995). Over 90 percent of the Coral Pink Sand Dunes tiger beetle's adult and larval populations are restricted to a relatively small area of the dune field in CPSD State Park, an area of 1,800 by 400 meters (5,900 by 1,000 feet).

Population Estimates/Status

The CPSD State Park has been surveyed since 1991 for population size of adults (fall only for 1991) and larvae (since fall 1992); estimates of peak adult numbers ranged from 803 to 2,740. Estimated population size has stayed below 2,000 individuals since 1997. Based on surveys in 2000, the population was 1,270 individuals, the second lowest number recorded since systematic surveys began (Knisley 2001). From 1991 to 1998 the method of estimating population size was mark-re-capture. This method resulted in an over-estimation of population size, especially when compared to the removal method used since then (Gowan and Knisley 2003). Quantification of the amount or significance of the over-estimation is difficult to determine. It has not yet been determined if re-calculations to determine actual population size over the past 14 years is possible.

The removal method for population estimates has been used since 1999. In 2002 the numbers for the counts were analyzed using the program CAPTURE. For smaller swales or those with small numbers of beetles, the direct visual index counts of all adults observed was used. The results gave a population estimate for the whole primary habitat of 2944 adults with a 95% confidence interval of 2643 to 3245 (Knisley 2003). Distribution of adults was similar to previous years. Swales with the most adults were in the northern part of the primary habitat. Numbers in the north part of the dunes continued to be low with only 12 counted. The total number of larvae counted in September 2002 was 1733, compared to 2393 in 2001 and 1509 in 2000. The distribution was also similar to previous years and generally comparable to adult abundance. Numbers of larvae in the north part of the dune continued to drop and reached a 7-year low of 22 (Knisley 2003).

Population estimates are not available for the disjunct larval bed and very small group of adults on BLM-managed land about 5 kilometers (3 miles) northeast of the Coral Pink Sand Dunes tiger beetle's main occupied habitat.

The Conservation Agreement (State of Utah 1997) goal of showing self sustaining or expanding

populations has not yet been achieved even though the overall population did apparently reach its highest recorded numbers in 2002.

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The species' habitat is being adversely impacted by ongoing recreational off-road vehicle (ORV) use. ORV activity is destroying and degrading the species habitat, especially the inter-dunal swales of the larval population. Inter-dunal swales are the most biologically productive areas in the CPSD ecosystem (Knisley and Hill 1995), due to an abundance of prey items. Continued survival of the species depends on the preservation of its reproductive areas and establishment of additional sub-populations in other suitable habitat sites within the CPSD. Destruction of the vegetation through off-road vehicle use reduces the ecosystem's photosynthetic base and habitat of Coral Pink Sand Dunes tiger beetle prey species (Knisley and Hill 1994). Within the limited area of the species concentrated larval beds, the diversity and abundance of invertebrate species, potentially suitable as prey species by Coral Pink Sand Dunes tiger beetle larvae, decrease with increased off-road vehicle use (Knisley and Hill 1995).

Additionally, recreational ORV activity is causing direct mortality of individuals of the Coral Pink Sand Dunes tiger beetle, especially adults. The species is particularly vulnerable during cool mornings before the beetles are able to warm themselves sufficiently to become active (Knisley 1990, Knisley and Hull 1994, 1995). One vehicle strike is rarely fatal, unless the ground surface is hard as is found in inter-dunal swales or unless the dune sand is wet. Vehicle injuries often immobilize the species, preventing it from avoiding natural predators, obtaining prey and reproducing successfully (Knisley and Hill 1994, 1995).

Direct ORV impacts to the majority of the species habitat were curtailed in 1998 by the BLM and State Parks. The species population, however, declined until 2002 (Knisley and Hill 1997, 1998, 2001; Knisley 1999, 2000, 2001, 2002). The population increase noted in 2002 was the first indication that the species may be recovering. Further monitoring is needed to validate this assumption before the species can safely be removed from its candidate status.

A primary effect on tiger beetle populations now appears to be climate, with OHV use and other effects or uses assuming a more secondary role (Knisley, 2002). Environmental parameters affecting tiger beetle population dynamics continue to be evaluated.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

The subspecies is vulnerable to over-collecting by professional and hobby tiger beetle collectors. Tiger beetles are second only to butterflies among the insects that are desirable objects of natural history collections (C.C. Knisley, pers. Comm.. 1995). The species has been collected, heavily at times, since its discovery and publication of the species description (Rumpp 1961, Knisley and Hill 1994, Knisley and Hill 1995). Collection of adults, before they mate and lay their eggs, may severely reduce the population's reproductive capacity. Although some collection may be legitimate, adding valuable knowledge of biogeography, taxonomy and life history of the species, this activity needs to be controlled. Quantifying this threat is difficult without continuous monitoring of the population.

C. Disease or predation.

Natural mortality through biotic factors such as predators and parasites, and abiotic factors such as starvation, flooding, or droughts probably account for considerable population loss of both adult and larval Coral Pink Sand Dunes tiger beetles (Knisley and Hill 1995). Wasps of the genus *Methoca* parasitize CPSD tiger beetle larvae (Knisley and Hill 1995). The significance of this factor is still not well understood.

D. The inadequacy of existing regulatory mechanisms.

The Coral Pink Sand Dunes tiger beetle is not directly protected by regulatory mechanisms, no state laws in Utah provide protection to insects but a Conservation Agreement and Strategy (1997) has been implemented. It consists of a collaborative effort that details recommended conservation objectives and actions designed to protect and recover the tiger beetle. The initial term of the Agreement is 10 years, and also calls for an analysis of actions implemented since 1997 and objectives met during the first five years of implementation (State of Utah, 1997).

Following completion of the Conservation Agreement, two conservation areas to maintain and protect tiger beetle populations were established. One conservation area is within the Coral Pink Sand Dunes State Park and the other area is on adjacent BLM administered lands.

The southern portion of Coral Pink Sand Dunes, and the bulk of the Coral Pink Sand Dunes tiger beetle population, lies within a Utah State Park which consists of 207 acres that is closed to off-highway vehicle (OHV) use. An additional 137 acres were restricted for use as a travel corridor. Some protection could be extended to the species by implementing regulations designed to protect natural features within State parks. However, the principal reason for the establishment of the park and one of its primary ongoing uses is as an off-road vehicle recreation area. This use has been demonstrated to be one of the most significant human-caused threats affecting the Coral Pink Sand Dunes tiger beetle. CPSD State Park completed a land use plan amendment for the Coral Pink Sand dunes in 2000 (USDI, BLM, 2000). A second conservation area is within the northern portion of the Coral Pink Sand Dunes and is Federal land managed by BLM. The BLM recognized the Coral Pink Sand Dunes tiger beetle as a sensitive species for land use planning. This area consists of 370-acres and is closed to OHV use. The BLM portion of the sand dunes however, is within the Moquith Mountain Wilderness Study Area (WSA); because off-road vehicle use existed before the designation of the WSA, it continues as a legitimate activity in designated locations.

It is expected that the implementation of measures within the Conservation Agreement (1997) will stabilize the species population and begin its recovery. However, the beneficial effects of this agreement have not yet resulted in an increase of the Coral Pink Sand Dunes tiger beetle population size.

E. Other natural or manmade factors affecting its continued existence.

The distribution and population of the Coral Pink Sand Dunes tiger beetle are among the most restricted and smallest of any known animal species. Given its endemism and small population, the species' existence is vulnerable to extinction from stochastic events such as flood or drought.

Without other populations to provide a source of re-colonization of vacant habitat, extinction can occur from what would otherwise be a common natural occurrence.

Acute changes in the species habitat as a consequence of flooding or drought may adversely affect the species. Flooding of the low-lying, inter-dunal swale habitat could drown the Coral Pink Sand Dunes tiger beetle larval population. Prolonged drought may cause mass starvation of the larval and adult population (Knisley 1995).

For removals:

N/A Is the removal based on a Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE) finding. If “Yes”, summarize the specific PECE evaluation criteria that were met in determining that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species identified through the section 4(a)(1) analysis.

FOR PETITIONED CANDIDATE SPECIES (also complete c and d for initial 12-month petition findings):

- a. Is listing warranted? Yes
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
- c. Is a proposal to list the species as threatened or endangered in preparation? No
If the answer to c. above is no, provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, emergency listings, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the 12 months, see the discussion of “Progress on Revising the Lists,” in the current CNOR which can be viewed on our Internet website (<http://endangered.fws.gov/>).

LAND OWNERSHIP: Over 90 percent of the species population occurs on Utah's Coral Pink Sand Dunes State Park. The remainder of the species population occurs on adjacent BLM-managed public land.

PRELISTING:

The FWS developed a Conservation Agreement with the State of Utah and BLM to provide for the species conservation (State of Utah, 1997). Following completion of the Agreement, the State Park established a conservation area by closing 207 acres to OHV use. An additional 137 acres were restricted for use as a travel corridor. CPSD State Park personnel also fenced several swales and signed the travel corridor. Fences were later removed as there was no evidence that

the enclosures were providing measurable protection for larvae and/or adults and some fences quickly became covered with drifting sand posing potential dangers to Park personnel and OHV riders. The Utah BLM completed a land use plan amendment for the CPSD in 2000. An additional conservation area of 370 acres has been closed to OHV use. BLM and State Park personnel have promoted public awareness and conservation of the tiger beetle. Visitors to the sand dunes and other interested persons have access to two brochures prepared by State of Utah's Division of Park and Recreation on the tiger beetle. The State Park has posted tiger beetle interpretation signs at various locations at the dunes.

A Conservation Agreement and Strategy Committee has been established to coordinate activities involving management of the tiger beetle. The committee meets on an informal basis to evaluate management actions and needs.

DESCRIPTION OF MONITORING:

The tiger beetle continues to be monitored on a yearly basis by Dr. Barry Knisley of Randolph-Macon College. Dr. Knisley's studies have documented changes in the tiger beetle populations since 1992. As part of his annual research he continues studies on tiger beetle life history and biology. There has been some confusion regarding the accuracy of documenting population numbers. This resulted from the type of population estimate methods used early in the monitoring effort. Before 1999 methods of estimating population size by the mark-re-capture method resulted in an over-estimation of population size, especially when compared to the removal method used since then (Gowan and Knisley 2003). These concerns have been addressed and apparently corrected. Quantification of the amount or significance of the over-estimation is difficult to determine. It has not yet been determined if re-calculations to determine actual population size over the past 14 years is possible.

The Conservation Agreement goal of showing self sustaining or expanding populations has not yet been achieved

REFERENCES:

- Bureau of Land Management, 1980b. Off-Road Vehicle Implementation Plan, Paria, Zion, and Vermilion Planning Units. September 30, 1980. 7 pp. plus attachments.
- Bureau of Land Management, *Federal Register Notice*, 1980c. Notice of Off-Road Vehicle Designations for the Paria, Vermilion, Zion Planning Units, BLM. September 25, 1980.
- Bureau of Land Management, 1980d. BLM Intensive Wilderness Inventory, Final Decision of Wilderness Study Areas. Utah. November 1980. 404 pp.
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- Bureau of Land Management. 1990. Utah BLM Statewide Wilderness Final Environmental Impact Statement. Volume III, Part B. South-west Region. November, 1990. Moquith Mountain WSA. 27 pp.
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LISTING PRIORITY

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9 *
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Rationale for listing priority number:

Magnitude: Moderate

This species is highly restricted to one small population threatened by recreational ORV use in its only habitat. That threat is currently managed by active measures taken by both the Utah Department of Parks and Recreation and the BLM. The species population is still at low levels and does not appear to be improving despite efforts prescribed in the Conservation Agreement, primarily consisting of limiting OHV use, public awareness and additional research.

Imminence: Imminent

The threat to the species is imminent because it is a narrow endemic and is intrinsically vulnerable as well as being subject to ongoing heavy collection and continues to be effected by ORV use in its restricted habitat.

Is Emergency Listing Warranted?

No. The Conservation Agreement and implementing Conservation Committee continue to provide effective management direction for the Coral Pink Sand Dunes tiger beetle.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all 12-month petition findings, additions of species to the candidate list, removal of candidate species, and listing priority changes.

Approve: Ralph Morgenweck August 30, 2004
Regional Director, Fish and Wildlife Service Date

Concur: Matt Hogan, Acting 5/2/05
Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks: _____

Date of annual review: July 14, 2004
Conducted by: Marianne Crawford

Comments: _____

