CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Cicindela limbata albissima*

COMMON NAME: Coral Pink Sand Dunes tiger beetle

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: January 30, 2003

STATUS/ACTION: (Check all that apply):
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned--Date petition received: April 21, 1994
_X_ 90-day positive--FR date: September 8, 1994
___ 12-month warranted but precluded--FR date: ___
__ Listing priority change
Former LP:__
New LP: __
Latest date species first became a candidate: 1994
___ Candidate removal: Former LP: ___ (Check only one reason)
__ A - Taxon more abundant or widespread than previously believed or not subject to a 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.
__ M - Taxon mistakenly included in past notice of review.
__ N - Taxon may not meet the Act=s definition of Aspecies.@
__ 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:
Utah - Kane County

LEAD REGION CONTACT: Chuck Davis, (303) 236-7400, extension 235

LEAD FIELD OFFICE CONTACT: Salt Lake City, Utah, Larry England, (801) 975-3330x138

BIOLOGICAL INFORMATION:

The Coral Pink Sand Dunes tiger beetle is known to occur only at Coral Pink Sand Dunes (CPSD), approximately seven miles west of Kanab, Kane County, in south-central Utah. 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 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 the Kanab Resource Area of the Bureau of Land Management. The BLM portion of the Dunes is within the Moquith Mountain Wilderness Study Area.

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 (383 miles) from other populations of the species (Knisley and Hill 2001). A recently completed genetic analysis of the *C. limbata* complex 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); however, the Coral Pink Sand Dunes tiger beetle has not yet been formally described as a unique species (C.B. Knisley, Randolph-Macon College, pers. com. 2002).

The Coral Pink Sand Dunes tiger beetle may be one of the worlds most restricted and rare tiger beetles with virtually the entire reproductive population confined to one site 800 x 300 meters (880 x 330 yards) in size (Knisley and Hill 1994; C.B. Knisley, pers. comm. 1995). 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 site has been surveyed since 1991 for population size of adults (fall only for 1991) and larvae (since fall 1992), and estimates of peak adult numbers ranged from 803 to 2,740. The estimated population size has stayed below 2000 individuals since 1997. The most recent estimate for the species, based on surveys in 2000, was 1270 individuals, the second lowest number recorded since systematic surveys began (Knisley 2001). Over 90 percent of the Coral Pink Sand Dunes tiger beetle's adult and larval population is restricted to a relatively small area of the dune field in CPSD State Park, an area 1,800 x 400 meters (2,000 x 440 yards). A second disjunct larval bed and a very small group of adults occur on BLM-managed land about 5 kilometers (3 miles) northeast of the Coral Pink Sand Dunes tiger beetle's main occupied habitat.

Larval Coral Pink Sand Dunes tiger beetles inhabit inter-dunal swales, typically, dominated by the leguminous plants *Sophora stenophylla* (silvery sophora) and *Psoralidium lanceolatum* (dune scurfpea), and several grasses including *Sporobolus cryptandrus* (sand dropseed) and *Stipa hymenoides* (indian ricegrass). Larval Coral Pink Sand Dunes tiger beetle burrows are found in congregations of various sizes forming larval beds. The larvae occupy burrows from which they ambush and prey on small invertebrates, mostly insects and other arthropods. The swales are much more productive micro-habitats than the surrounding sand dune slope habitat of the adults (Knisley and Hill 1994, 1995).
Adult Coral Pink Sand Dunes tiger beetles prey on a variety of live insects and scavenge dead insects and insect parts. Adults exist on open dune slopes in an area with very limited food availability (Knisley and Hill 1994). Abundance of adult Coral Pink Sand Dunes tiger beetles

also decreases with declines in prey species abundance.

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. Having the greatest abundance of suitable prey species, the inter-dunal swales are the most biologically productive areas in the CPSD ecosystem (Knisley and Hill 1995). The continued survival of the species depends on the preservation of its habitat at the only reproductive site and the probable need to establish or reestablish additional reproductive sub-populations in other suitable habitat sites within the CPSD. Destruction of the vegetation through off-road vehicle trampling 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).

The relative abundance of adult Coral Pink Sand Dunes tiger beetles and its prey species follows the same pattern of distribution in relation to off-road vehicle usage as do larval Coral Pink Sand Dunes tiger beetles, with the greatest concentrations in areas with the least off-road vehicle usage (Knisley and Hill 1995). The direct ORV threats to majority of the species habitat was stopped 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 in 2002 was the first indication that the species may be recovering. Further monitoring is need to validate this assumption before the species can safely be removed from its candidate status.

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.B. 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. We have received reports that several serious tiger beetle collectors probably visit CPSD annually, collecting 20 to 60 or more adults each (B. Knisley, pers. comm. 1995). Although some collection may be legitimate, adding valuable knowledge of biogeography, taxonomy, and life history of the species, this activity needs to be controlled, as one avid collector could reduce the adult population by as much as 3 to 4 percent. 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 and flooding or droughts probably account for considerable population loss of both the Coral Pink Sand Dunes tiger beetle adult and larval populations (Knisley and Hill 1994, 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 any regulatory mechanism. The southern portion of CPSD, and the bulk of the Coral Pink Sand Dunes tiger beetle population, lies within a Utah State Park. No state laws in Utah provide protection to insects. 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.

The northern portion of CPSD is Federal land managed by BLM. The BLM recognizes the Coral Pink Sand Dunes tiger beetle as a sensitive species for land use planning. The BLM portion of the sand dunes is within the Moquith Mountain Wilderness Study Area (WSA); however, because off-road vehicle use existed before the designation of the WSA, it continues as a legitimate activity.

The entire CPSD has been designated critical habitat for the threatened *Asclepias welshii* (Welsh's milkweed) (52 FR 41440). However, concentrations of *A. welshii*, do not correspond to the concentrated areas of the Coral Pink Sand Dunes tiger beetle population, especially the larval population (U.S. Fish and Wildlife Service 1992, Franklin 1992, Knisley and Hill 1994, 1995). Protection of *A. welshii* would not provide effective protection of the Coral Pink Sand Dunes tiger beetle.

The BLM has implemented measures to control recreational ORV use on land that it manages. The BLM has prohibited ORV use in about 370 acres of the Coral Pink Sand Dunes. This area includes the occupied portion of the CPSD tiger beetle's habitat on federal lands. However, control of recreational ORV use on CPSD State Park is underfunded and understaffed (Knisley and Hill 1994, 1995; J. Byergo, Bureau of Land Management, Kanab, Utah, pers. comm. 1993; T. Smith, CPSD State Park, Kanab, Utah, pers. comm. 1993, R. Quist, Coral Pink Sand Dunes State Park, pers. comm. 1995). The FWS, BLM, and Utah State Parks signed and implemented a conservation agreement in 1997. It is expected that the implementation of conservation measures within the conservation agreement 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.

Recreational off-road vehicle activity is causing direct mortality of individuals of the Coral Pink Sand Dunes tiger beetle, especially adults. The species is especially 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). Larval Coral Pink Sand Dunes tiger beetles are partially protected from direct off-road vehicle impact by their burrows. Impacts to larval Coral Pink Sand Dunes tiger beetles are from habitat degradation and destruction as discussed above in factor "A."

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 with lost populations, 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 has the potential of drowning the Coral Pink Sand Dunes tiger beetle larval population. Prolonged drought may cause mass starvation of the larval and adult population (Knisley 1995). Insecticide use in or near the habitat of the Coral Pink Sand Dunes tiger beetle may have disastrous consequences for the species.

A second species of tiger beetle, *Cicindela tranquebarica*, occurs with the Coral Pink Sand Dunes tiger beetle in CPSD. In areas nearer more intense disturbance from off-road vehicles, at the south end of the Coral Pink Sand Dunes tiger beetle population concentration, *C. tranquebarica* is more abundant than the Coral Pink Sand Dunes tiger beetle (Knisley and Hill 1995). The congeneric tiger beetle, *C. tranquebarica*, may, over time, replace the population of the Coral Pink Sand Dunes tiger beetle in its only occupied habitat.

FOR RESUBMITTED PETITIONS:

a. Is listing still 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
d. If the answer to c. above is no, provide an explanation of why the action is still precluded: Since publication of the 2002 CNOR, the publication of a proposed rule to list this species has been precluded by other higher priority listing actions, and based on work scheduled we expect that will remain the case for the remainder of Fiscal Year 2004. Almost the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of the Coral Pink Sand Dunes tiger beetle 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.

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.

REFERENCES:

Hill, J.M., and C.B. Knisley. 1993. A study of rare species of uncommon habitats on Bureau of Land Management holdings in Utah, with special emphasis on a Category 2 Federal Candidate Tiger Beetle, *Cicindela limbata albissima*. Unpublished report on file with the Bureau of Land Management. Salt Lake City, Utah. 64 pp.

Knisley, C.B., T.D. Schultz, and J.H. Hasewinkel. 1990. Seasonal activity and thermoregulatory behavior of *Cicindela paturela* (*Coleoptera: Cicindelidae*). Ann. Entomol. Soc. Amer. 83:911-915.

Knisley, C.B., and J.M. Hill. 1994. Coral Pink Sand Dunes Tiger Beetle, *Cicindela limbata albissima* Current Status and Biology. Unpublished Status Report on file with the U.S. Fish and Wildlife Service and Bureau of Land Management. Salt Lake City, Utah. 36 pp.

Knisley, C.B., and J.M. Hill. 1995. Biological Studies of the Coral Pink Sand Dunes Tiger Beetle, and Surveys for other Rare Beetles in Utah, 1994. Unpublished Status Report on file with the U.S. Fish and Wildlife Service and Bureau of Land Management. Salt Lake City, Utah. 43 pp.

Knisley, C.B., and J. M. Hill. 1996. Biological studies of the Coral Pink Sand Dunes Tiger Beetle, *Cicindela limbata albissima* and other rare Utah dune insects. Report to Bureau of Land Management.

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Knisley, C.B., and J. M. Hill. 2001. Biology and Conservation of the Coral Pink Sand Dunes Tiger Beetle, *Cicindela limbata albissima* Rumpp. Western North American Naturalist 61 (4):381-394.

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Knisley, C.B. 2001. Biology and Conservation of the Coral Pink Sand Dunes Tiger Beetle, *Cicindela limbata albissima*, Year 2000, Final Report. Report to the U.S. Fish and Wildlife Service.

Knisley, C.B. 2002. Biology and Conservation of the Coral Pink Sand Dunes Tiger Beetle, *Cicindela limbata albissima*, Year 2001, Final Report. Report to the U.S. Fish and Wildlife Service.

Morgan, M., C.B. Knisley, A.P. Vogler. 2000. New Taxonomic Status of the Endangered Tiger Beetle *Cicindela limbata albissima* (Coleoptera: Cicindelidae): Evidence from mtDNA Annals of the Entomological Society of America 93:1108-1115.

Rumpp, N.L. 1961. Three new tiger beetles of the genus *Cicindela* from southwestern United States (*Coleoptera-Cicindelidae*). Bull. So. Calif. Acad. Sci. 60:165-187.

U.S. Fish and Wildlife Service. 1992. Welsh's Milkweed (*Asclepias welshii*) recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 19 pp.

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

Rationale for listing priority number:

Magnitude: This species is highly restricted to one small population with the potential for extinction represented 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 which reduces the threat from High to Moderate. The species population is still at low levels and has only recently improved.

Imminence: The treat to the species is imminent.

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 additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Ralph O. Morgenweck April 1, 2003
Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

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

Director's Remarks:

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Date of annual review: January 30, 2003

Conducted by: Larry England

Comments:

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