BEFORE THE SECRETARY OF THE INTERIOR

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| CENTER FOR BIOLOGICAL DIVERSITY<br><br>SIERRA CLUB<br><br>DAVID H. WRIGHT, PH.D.<br><br>Petitioners | Petition to Emergency-List<br>Casey's June Beetle<br>(Dinacoma caseyi Blaisdell 1930)<br>as a Federally Endangered Species |

Photo by Dale Powell

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Petition to list Casey's June Beetle as a Federally Endangered Species

The Sierra Club, Center for Biological Diversity, and David H. Wright, Ph.D., hereby formally petition the Secretary of Interior (Secretary) to list Casey's June beetle, Dinacoma caseyi Blaisdell 1930 (hereafter, Casey's June beetle or "the beetle"), as endangered pursuant to the Endangered Species Act, 16 U.S.C. 1531 et seq. (hereafter "the Act"). This petition is filed under 5 U.S.C. 553 (e) and 50 CFR 424.14 (1990), which grant interested parties the right to petition for issue of a rule from the Secretary of the Interior.

## Critical Habitat

Petitioners also note that critical habitat should be designated for the beetle concurrent with final listing, consistent with 50 CFR 424.12, and pursuant to the Administrative Procedures Act (5 U.S.C. 553). We note that species with designated critical habitat are in better recovery status than species without (Rachlinski 1997, http://www.nativeecosystems.org/criticalhabitat/Critical_Habitat_Fact_Sheet_May_2003.pdf , http://www.biologicaldiversity.org/swcbd/programs/policy/ch/sub1.html).

## Emergency Listing

Because of the extremely limited range of the species and extraordinary imminent threats to its continued existence, we strongly urge the Secretary and the U.S. Fish and Wildlife Service ("Service") to immediately undertake emergency listing of the species. It is likely that the beetle would be extinct or would be beyond saving by the time an ordinary listing process could be completed. Therefore we are providing the necessary information and justification for an emergency rule listing the species as endangered.

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David H. Wright, Ph.D., Conservation Biologist Date

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Center for Biological Diversity Date

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The Sierra Club Date

**SUPPORTING MATERIALS FOR THE EMERGENCY LISTING OF CASEY'S JUNE BEETLE AS A FEDERALLY ENDANGERED SPECIES**


**SUMMARY**:

Casey's June beetle (*Dinacoma caseyi*) warrants listing as endangered under the Endangered Species Act of 1973, as amended. Because of extraordinary imminent threats to its continued existence, emergency listing, effective immediately, is required so that the species is not rendered extinct or beyond recovery in the time required for listing to take place. Casey's June beetle is presently restricted to only two populations in a small area in the southern part of Palm Springs, California. Remaining habitat is about 600 acres in approximately nine fragments, and actively declining, due to ongoing urban development. The species is found in sandy soils in the southwestern Coachella Valley. Males fly in late spring to find mates, and are attracted to lights. Females spend their lives underground and only come to the ground surface to mate.

The principle threat to the species and the cause of its present reduced state is habitat destruction, degradation, and fragmentation due to urban, residential, and recreational development. Other threats include ground disturbance or vegetation removal, for example from grading, ripping, or off-road driving; impacts from artificial lighting, swimming pools, channelization, collecting, road kill, inadequate regulatory mechanisms, and the elevated extinction risks common to greatly reduced populations. We find these threats, especially the imminent irreversible impact of complete habitat destruction by urban development, constitute immediate and significant threats to the Casey's June beetle, warranting immediate Federal protection.


**Background**

Description. There are two described species in the genus *Dinacoma* (Coleoptera: family Scarabaeidae, subfamily Melolonthinae, tribe Melolonthini): *D. caseyi* and D. marginata. Casey's June beetle was discovered in 1916 and described by Blaisdell (1930) based on male specimens. Both species are restricted to southern California. As early as 1990, Casey's June beetle was considered to be endangered (and D. marginata threatened: Duff 1990).

Recent workers believe an undescribed species of *Dinacoma* lives near Hemet, California; this unnamed beetle is more similar to *D. marginata* (with which it was formerly lumped) than *D. caseyi* (G. Ballmer, UC Riverside, pers. comm. 2003; D. Hawks, UC Riverside, pers. comm. 2003) (photo at http://davesgarden.com/j/si/42098 ). Other undescribed species or subspecies of *Dinacoma* may be found in Baja California and California near the Mexico-USA border, and in Joshua Tree National Park. All are localized in distribution, and geographically and morphologically distinct from *Dinacoma caseyi*. *Dinacoma caseyi* is reproductively isolated from other members of the genus.

Casey's June beetles are medium-sized June beetles (June beetles are named after their

tendency to fly in late spring evenings), 1.4 to 1.8 cm (0.55 to 0.71 inches) in length, dusty brown or whitish in color with appearance of brown and whitish longitudinal stripes on the elytra. Their antennae are clubbed, as is common to scarab beetles, and reddish-brown in color. The clubbed ends consist of a series of leaf-like plates that can be held together, or fanned out to sense scents. Most of the body has a covering of whitish scales, supplemented on much of the head, thorax and ventral surfaces with fine white hairs (Hardy 1974). A picture of the beetle is on the cover of this petition and at http://www.biologicaldiversity.org.

Life Cycle. As larvae (grubs), June beetles generally feed underground on plant roots, or on buried plant detritus with its associated decay organisms. Larvae of the Melolonthinae generally feed on fine plant roots (Evans 2001). D. LaRue (pers. comm. 2004) has found that early stage larvae of Casey's June beetle feed on fine rootlets of phreatophytic (deep-rooted, relying on ground water) trees and shrubs within its habitat, and on buried layers of organic debris. Whether Casey's June beetle has a particular host plant is unknown, but females have been found under cheesebush (*Hymenoclea salsola* [Asteraceae], also known as burrobrush) (Hovore 1995). How long the larvae live is not well known–2 to 3 years to complete larval development is common among eastern June beetles (Borror et al. 1981, p. 405). Excavations of several plant root systems–including cheesebush–during flight season found no larvae, leading Hovore (1995) to hypothesize that the larval cycle is one year. D. LaRue also believes the larval period is one year (pers. comm. 2004). However, additional data are needed to determine the duration and degree of plasticity in the duration of the larval period. The larvae pupate beneath the soil, at depths of about 10 to 16 cm (4 to 6 inches) (Hovore 1995) and perhaps deeper.

Adults emerge from holes in the ground and the males fly in late March through June (Hovore 1995), peaking usually in mid to late May (Hovore 1997a), depending on rainfall and temperature patterns. The adults emerge to mate–feeding by adults has not been observed, nor induced in captivity (Hovore 1995). Males generally fly on warm, calm nights when temperatures at dusk are about 70 degrees F (21 C), following daytime maximum temperatures of 90 to 100 degrees F (32-38 C) (Hovore 1995). The males fly swiftly over the ground from about one hour before dusk to shortly after dark, sometimes in a searching pattern, in search of females (Duff 1990; Hovore 1995; CVAG [Coachella Valley Association of Governments] 2001a, b). Male activity declines about an hour after sunset. Captive males remain inactive during daylight hours, and become active toward dusk (Hovore 1995).

Females have rarely been found, always on the ground, not in flight. Other species with flightless females are not uncommon among the melolonthine scarabs (F. Hovore, pers. comm., 2003). Female Casey's June beetles emerge from the ground near dusk and either remain at the end of their "burrows" or crawl over the ground (Duff 1990). Emergence holes may or may not be near any significant plant growth. As dusk progresses, females turn downward in the burrow entrance and extend the tip of their abdomen slightly above the burrow opening, presumably exuding a pheromone that the males use to find them (Hovore 1995). Several males have been observed flying back and forth in close vicinity or crawling on the ground when a female has been detected

(Duff 1990).

After mating, the female retreats down her emergence hole, or digs a new hole (CVAG undated). Females deposit eggs within damp sand at varying depths, commonly 5 to 20 cm or more below the dry sand/wet sand interface (D. LaRue, pers. comm. 2004). Within an hour of mating, in the laboratory females laid 1 - 4 eggs, although these numbers may not be representative of fecundity under natural conditions (D. LaRue, pers. comm. 2004). The damp sand provides consistent temperatures and humidity that prevents dessication of eggs and larvae. According to D. LaRue (pers. comm. 2004), in the laboratory the eggs hatch in about 3 to 4 weeks, larval stages (instars) require about 10 to 18 weeks each, pre-pupal quiescence and pupation occupy 3 to 8 weeks, and adult longevity is based on metabolic resources accrued during larval feeding and development. Survivorship and many details of the beetle's life cycle in the field are unknown.

Males are readily attracted to artificial outdoor lights (Duff 1990; CVAG 2001a, b), which may interfere with survival and mating; and to swimming pools, where they drown (CVAG undated, Cornett 2000, Barrows & Fisher 2000).

Distribution and Habitat. Casey's June beetle has always had an extremely limited distribution: namely, the alluvial plains bordering the San Jacinto and Santa Rosa Mountains along the southern edge of the Coachella Valley, in and around Palm Springs, Riverside County, California. At present it only is known to occur in the south Palm Springs, California, area, where potential habitat amounts to roughly 600 acres in about 9 remnant habitat fragments, and is decreasing due to continuing development. One location is near the junction of South Palm Canyon Drive and Bogert Trail (a road), on private land. This population is in the process of having nearly all of its habitat destroyed by active or pending development. A second location is within the Smoke Tree Ranch development, south of Highway 111 and east of Sunrise Road. A survey reported in a constraints analysis for the "Monte Sereno" project (which currently is poised to destroy more than 30 acres of beetle habitat, in the Bogert Trail area, T5S R4E, sect. 35) captured beetles in light traps set within the Palm Canyon wash, from the project site to the junction of the wash with Tahquitz Creek, with especially large numbers adjacent to Smoke Tree Ranch (McGill 2003). There also may be habitat of the species on land within the Agua Caliente Indian Reservation, for example in Palm Canyon south of the Bogert Trail population. There has been minimal reporting on the results of surveys done since 1999 on Reservation land in Palm Canyon, so currently we are uncertain what has been found there (CVAG 2001a, b; McGill 2003), though Barrows (1998) observed probable emergence holes near the entrance gate to the Indian Canyons, and Cornett (2000) detected the beetle just north of Acanto Drive.

Historic records of the beetle from elsewhere in Palm Springs and nearby communities are from areas that have been thoroughly developed or otherwise altered and no longer have appropriate habitat (Noss et al. 2001). Surveys in undeveloped remnants in these areas have not detected the beetle in recent decades (Barrows 1998, Barrows & Fisher 2000, Powell 2003, D. Hawks pers. comm. 2004). Surveys conducted in 1999 for the

Agua Caliente Band of Cahuilla Indians (for their Multiple Species Habitat Conservation Plan, under discussion/development, covering reservation lands) failed to detect any individuals of this species (CVAG 2001a). Certain other locations previously suggested as potentially suitable habitat, such as the mouths of nearby Deep Canyon and Dead Indian Canyon, have not been shown to support the beetle in multiple surveys (Barrows and Fisher 2000, C. Barrows pers. comm. 2003, D. Hawks pers. comm. 2004). A survey for the Palm Springs Classic project – 450 acres north of the airport and southwest of Whitewater Wash with extensive potentially suitable habitat – did not detect the beetle (Cornett 2003). Similarly, a survey for the Palm Springs Village project – 309 acres east of North Indian Avenue and southwest of Whitewater Wash, also with extensive potentially suitable habitat, did not detect the beetle (Cornett, 2004). Surveys in potential habitat in Cathedral City, Tachevah Canyon, and Snow Creek in spring of 2003 did not find the species (Powell 2003). A 2003 survey for the beetle on behalf of the CVAG Multi-Species Habitat Conservation Plan effort is scheduled to be released imminently but is not expected to reveal any new extant localities. There is an active community of amateur and professional entomologists with interests in beetles, and scarab beetles are a popular subject. Duff (1990) stated that these coleopterists have been on the lookout for the beetle for years (and the beetle can be found with commonplace light-trapping methods), but no additional occurrences have been discovered, and this situation continues today (C. Barrows pers. comm. 2003, F. Hovore pers. comm. 2003, D. Hawks pers. comm. 2004).

Based on descriptions of historic range and early collections, the beetle apparently formerly occurred from Palm Springs, possibly as far west as Snow Creek (about 15 km (10 mi) away), to the vicinity of Indian Wells (about 30 km (20 mi) east-southeast), if older specimens are labeled correctly. All of the historic and extant localities occur on alluvial fans where dissipating flows deposit finer silts and sands (Hovore 1995, 1997b) on the southwest side of the Coachella Valley. Other species with highly restricted geographic ranges are not uncommon in the subfamily of scarabs to which the beetle belongs, and restricted ranges are common among the species whose females do not fly (F. Hovore pers. comm. 2003, D. Hawks pers. comm. 2004).

In addition to taxonomic and behavioral explanations for the beetle's restricted historic range, south Palm Springs has unique local climate conditions, influenced by adjacent mountains and ridges and proximity to San Gorgonio Pass (NCSS 1980, p. 83). Rainfall is locally higher in south Palm Springs than at locations in the valley center or to the east. Soil moisture is important to the beetle, which like other subterranean desert scarabs appears to prefer the interface between dry surface sandy soil and wet sandy soil below (F. Hovore, pers. comm. 2003). In addition to soil that the beetle can dig through, adequate soil moisture close enough to the surface for the beetle to reach may be important to the species, and near-surface moist soil conditions might be less common toward the valley center. Wind is another relevant climatic factor. Strong winds are prevalent near the pass, but mountains and ridges around south Palm Springs shelter the area from high winds and blowing sand. High winds could interfere with male flight or disperse the female pheromones they follow in order to find mates. These are still untested hypotheses, seeking to understand the beetle's restricted historic distribution.

However, the beetle likely persisted for thousands of years with a restricted distribution--though less restricted than at present. Most important to its current risk of extinction are the effects of urban development on its remaining populations, as discussed further below.

The known populations of the beetle at Bogert Trail and Smoke Tree Ranch occur on the Carsitas gravelly sand, 0 to 9% slopes, (CdC) soil type as mapped by the Soil Conservation Service. Hovore (1997b) has suggested that Carsitas gravelly sand on 9 to 30% (CdE) slopes also may be suitable, though the beetle is not known from them. These soils are gravelly sands, often with a noticeable "crypto-biotic" crust, of nitrogen-fixing blue-green bacteria and fungi. These soils tend to occur along the base of the mountains, in areas now extensively developed for urban and agricultural uses, so that very little potential habitat still exists (Hovore 1997b; CVAG 2001a, b). Other soil types may be suitable, but no definitive data are available. A portion of Smoke Tree Ranch is on Myoma fine sand, 0 to 5 % slopes (NCSS 1980).

While the beetle may or may not be specific to particular named soil types (Cornett 2000), its burrowing habits suggest it requires soil it can readily dig into, neither too dense (clayey) nor too rocky or cemented. For this reason, sandy soils such as those derived from alluvium appear appropriate. The species has never been found from aeolian (windblown) sands (Hovore 1995, p. 6). Hovore (1997b) noted that most of the southern half of Palm Springs proper is underlain by CdC soils. Due to development of Palm Springs, the majority of potential habitat for the beetle has been destroyed, and development continues. Habitat destruction is discussed in more detail under Factor A, below.

The recent finding of several hundred Casey's June beetle males at light traps in Palm Canyon Wash in the vicinity of the Smoke Tree Ranch development (McGill 2003), reveals more about the beetle's life history. D. Powell (2003) confirmed the presence of male beetles at the junction of Palm Canyon and Tahquitz Creek washes, about a mile east of Smoke Tree, in spring 2003. While females and larvae have not yet been seen in the wash, probable emergence holes of females have been observed there (F. Hovore, pers. comm. 2003). If females – and so presumably larvae also – do use wash habitats, how are they affected by floods of different magnitudes? U.S. Geological Survey (USGS) streamflow data for Palm and Andreas Canyons, which join inside the Agua Caliente reservation and flow north and east through southern Palm Springs, indicate that in the last 25 years there have been at least two flow events exceeding 1000 cubic feet per second (cfs) in the Palm Canyon Wash, and four others exceeding 500 cfs (http://waterdata.usgs.gov/ca/nwis/; a flow of 1200 cfs would fill a 20 by 30 by 6-foot swimming pool in 3 seconds). In the soft bottom of the wash, turbulence associated with high flows is likely to excavate and disturb sands that may harbor beetles (Wright 2003). Severe floods also destroy vegetation and thus remove possible food sources for beetle larvae. Following major flood events, given sufficient time, areas scoured by the flood gradually re-vegetate. Therefore, wash sands likely represent risky and ephemeral habitat for the beetle, with uncertain periods of recovery and habitability between floods. Beetles from adjacent more-elevated habitats may be necessary to re-colonize wash

habitats periodically damaged by floods.

Other habitat requirements for the beetle may include plants, to provide roots for larval feeding. The beetle has only been found in areas of Sonoran (Coloradan) desert scrub and desert wash vegetation, and may be adapted to feeding on native plants. Appropriate densities and even species of its food plants are not known, but common plant associates include perennials cheesebush, creosote bush (*Larrea tridentata*), saltbush (*Atriplex* spp.), cholla cactus (*Opuntia* spp), catclaw (*Acacia greggii*), desert lavender (*Hyptis emoryi*), *Ambrosia dumosa, Justicia california, Datura wrightii, Encelia farinosa, Bebbia juncea, Lepidospartum squamatum*, desert willow (*Chilopsis linearis*), and smoke tree (*Psorothamnus spinosus*), and annuals Spanish needle (*Palafoxia linearis linearis*), vine milkweed (*Sarcostemma cynanchoides), Croton californicus*, suncups (*Camissonia* sp.), *Phacelia* sp., *Erodium* sp., and others (Hovore 1995; Amec, Inc. 2002, Dudek & Assoc. 2001).

If the beetle larvae make use of buried detritus, turbulent surface flows in washes, braided channels, or sheet flow could be important in burying rafts of detritus later used by the species. Upstream sources of detritus could then be important to the beetle. No information is currently available on any such habitat use.

**Previous Federal Action**

To our knowledge, there has been no previous federal action with respect to Casey's June beetle.

**Summary of Factors Affecting the Species**

Section 4 of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act (16 U.S.C. 1531 et seq.) set forth the procedures for adding species to the
Federal lists. The Service may determine a species to be endangered or threatened due to one or more of the five factors described in section 4(a)(1) of the Act. These factors (A through E) and their application to Casey's June beetle are as follows:

*A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range*

Cumulative habitat loss and degradation of the existing habitat as a result of development, including grading, soil disturbance, and removal of vegetation, are the major threat to the continued existence of Casey's June beetle. We have compiled data on destruction of a suitable habitat type–desert scrub on Carsitas CdC soils–within the USGS Palm Springs 7.5 minute topographic quadrangle, the heart of the beetle's historic distribution, and nearly its only remaining present distribution (Figure 1N, 1S):

> as of 1975, based on a 1975 aerial photograph used for the soil survey and the soil survey maps of CdC distribution (NCSS 1980), roughly 45 percent of CdC soils in the quadrangle had been developed
>
> by 1996, roughly 60 percent had been developed (based on a 1996 photo viewable at www.terraserver-usa.com)

Within the quadrangle, most of the remaining undeveloped CdC soils are north of Palm Springs center or north of the city proper, an area lacking in records of the beetle. Development impacts in the south, within the beetle's range, are more severe:

> In south and central Palm Springs, south of San Rafael Drive, over 80 percent of CdC soil habitat has been developed (unpublished data, based on 1996 imagery and ground checks).

While the Coachella Valley Association of Governments (CVAG) has mapped several hundred acres of "modeled core habitat" for Casey's June beetle north and east of the Palm Springs airport (eastern Palm Springs, adjacent to the Whitewater River wash; formerly at www.co.riverside.ca.us/cvag/mshcp/images/cj_beetle_map1.jpg but no longer available on-line), no beetles have been documented from these areas, now or in the past. Sizeable portions of this CVAG-mapped "modeled core habitat" area also have been developed or permitted for urban, recreation, and airport use. We believe there is no evidence that these areas contribute to the continued existence of the species, much less constitute "core" habitat.

Besides CdC soils, other soil types in Palm Springs and vicinity possibly suitable for the beetle have suffered a similar fate of habitat destruction by development; there is nothing unusual about CdC soils in this respect. Other friable, sandy soils similar to CdC soils in the Palm Springs area have also been extensively converted to urban and recreational development.

Fragmentation of habitat is also a concern; the remaining habitat patches are now smaller and more isolated from other habitat. For example, before urban development, within the Palm Springs topographic quadrangle there was an unbroken area of CdC soil well over 1000 acres in size in central and southern Palm Springs. This former habitat area is now mostly developed, and the remaining area is fragmented into nine separate pieces, several of which are presently threatened with development. Fragmentation can cause isolation of subpopulations and lower effective population size, resulting in increased extirpation risk and possible adverse genetic effects, discussed further under Factor E, below.

The beetle faces continuing loss and fragmentation of its habitat and range. For example, at time of preparation of this petition, at least two projects impacting the beetle are undergoing grading and construction:

> "Acanto Drive," 24 acres south and east of the Bogert Trail–South Palm Canyon Drive intersection

Pintura Homes, 13 acres, south of East Palm Canyon Drive and west of South Araby Drive

Also, a parking lot, less than 10 acres southeast of Alejo Road and North Indian Canyon Drive in central Palm Springs, is being graded on a remnant of CdC soil that likely was at one time beetle habitat.

At least five projects are formally proposed within beetle habitat south of central Palm Springs. All are likely to be implemented before the Service could prepare and publish an ordinary listing determination regarding the beetle:

1. Monte Sereno, north of Bogert Trail and west of Palm Canyon Wash, will destroy over 30 acres of beetle habitat. This project has received discretionary permits from the City (City of Palm Springs 2003, item 30). The project covers roughly one-third of the habitat area of the Bogert Trail population of the beetle (F. Hovore, pers. comm. 2003). Much of the rest of the Bogert Trail population has recently been destroyed for urban or recreational development.

2. El Portal, 34 acres, east of South Palm Canyon Drive and south of Bogert Trail. Listed as approved by the City Council (City of Palm Springs 2003, item 29).

3. Canyon Ranch, about 10 acres, west of South Palm Canyon Drive about 1/4 mile south of Bogert Trail

4. condominium project at Baristo and Av. Caballeros, about 3 acres

5. Desert Water Agency wells and pipeline on Smoke Tree Ranch open space, total direct impact 1.5 to 2 acres, DEIR in preparation at time of writing.

If these acreages seem small, this only reflects the extremely limited extent of all remaining habitat for the beetle. For example, only fragments totaling roughly 600 acres of CdC soils remain undeveloped in the Palm Springs topographic quadrangle south of San Rafael Drive. These five imminent projects would destroy over 11 percent of that remaining 600 acres, including most of the remaining area occupied by the Bogert Trail population of the beetle. If the water wells proposed at Smoke Tree Ranch would lower the level of the underground moist sand layer so that it were less accessible to the beetles, the habitat area impacted by this well project would be much larger than its surface footprint. We are not aware of information as to whether this project does or does not present a risk of groundwater drawdown.

While the projects listed above are the most immediate threats, numerous other project plans exist for beetle habitat, in various stages of project development. For example, the portion of Smoke Tree Ranch fronting on East Palm Canyon Drive (between Smoke Tree Lane and S. Barona Road) has been proposed for development before, without a project yet coming to fruition. The property, about 18 acres of beetle habitat, continues to be

actively advertised for lease and development. There are also plans to develop a parcel of roughly 25 acres north of Acanto Drive and west of Palm Canyon Wash, which – in combination with the (other) Acanto Drive project and the Monte Sereno and El Portal projects – would nearly complete the destruction of the known habitat of the Bogert Trail population of the beetle. These two examples are by no means an exhaustive list–"For Sale" and "Will Build to Suit" signs are common in beetle habitat in and around Palm Springs.

Additional proposed projects that would add to the cumulative loss of known habitat of the beetle south of San Rafael Drive include:

6. Communication sites at Smoke Tree Ranch .3 acre, preliminary application
7. Casitas at Smoke Tree, 25 acres, pre-application, target April 2005 construction (Smoke Tree Inc., 2004)

Additional acreage in CdC soils and south of Whitewater Wash that has been proposed for development includes

8. South Ridge Cove, 3 acres, application pending
9. McComic TTM 31848, 306 acres, in environmental screening

Habitat loss and fragmentation are not the only adverse impacts of development on the beetle. Near developed areas, male beetles can be attracted to pools, where they drown, and to lights, where they will fail to find females for breeding. These and other threats related to development are discussed further under factor E, below.

Washes and their vegetation that provide habitat for the beetle are adversely impacted by development activities, in Palm Springs and surroundings, resulting in loss of wash area and increased channelization. In several areas of Palm Springs, washes have been developed as golf courses, which do not serve as habitat for the beetle.

Development also increases short-term flood severity by increasing the speed and volume of runoff. Beetle mortality from flood events, if beetles/larvae are present in wash soils, would likely result, from injury, deep burial, drowning, or being washed downstream out of habitat. Channelization of washes, in addition to facilitating development of adjoining habitats with known value for the beetle, raises flood water levels and increases flow rates and turbulence during high flows, making it less likely that beetles would survive in the remaining channel. Severe flood events would also remove vegetation that might serve as food for beetle larvae, and more frequent sizeable floods would hinder revegetation in washes.

*B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Because of the beetle's extremely limited distribution, scientific use of the species has potential to adversely impact the species. Collection of series of specimens for identification and museum preservation is common in entomology, and could in

circumstances where populations are low significantly reduce the distribution or abundance of the beetle or, if pursued repeatedly, even cause local extinction. Scientific research, for example to determine the ecology and demographics of the species, could have similar limited effects. We are not aware of such impacts occurring at present. Most population studies of the beetle have used light-trapping of males, a practice that alters normal mate-finding and perhaps other behaviors, but with little physical damage to individuals and relatively brief temporary disruption of behavior.

As mentioned above, beetles and notably scarab beetles are popular with commercial and amateur insect collectors and traders. One Czech website ("Zverex-centrum") that appeared to include a collectors' purchase or trade area listed *Dinacoma caseyi* (Casey's June beetle) as part of their collection in the latter part of 2003; however as of March 2004 we could no longer find this site online. We have no information on trade in the species, and such activities are difficult to track. However, specimens of rare and even endangered species are coveted by an unscrupulous subset of the trade (August 7, 2002 Federal Register, vol. 67 page 51125).

*C. Disease or Predation*

Casey's June beetle likely is subject to naturally occurring diseases and predation in its native ecosystem. We are not currently aware of unusual impacts from disease or predation threatening the species. The attraction of Casey's June beetle males to lights may make it easy for bats, nighthawks, or other predators to take them; this possibility is discussed under Factor E, below.

*D. Inadequacy of Existing Regulatory Mechanisms*

Casey's June beetle occurs primarily on private lands, and to an unknown extent, may occur on tribal lands. What regulatory mechanisms currently exist do not fully protect the beetle on these lands, and to date have not successfully prevented the endangerment of the species.

The State of California does not extend the protections of its California Endangered Species Act to insects. Some consideration of the beetle may be provided under the California Environmental Quality Act (CEQA). CEQA provides for environmental review of some types of projects and requires that a project proponent publicly disclose the potential environmental impacts of proposed projects. Section 15065 of the CEQA Guidelines requires a ''finding of significance'' if a project has the potential to ''reduce the number or restrict the range of a rare or endangered plant or animal''. However, under CEQA, where overriding social and economic considerations can be demonstrated, a project may proceed despite significant adverse impacts to a species. Casey's June beetle has very little if any margin to absorb further significant adverse impacts without going extinct. Avoidance and mitigation of impacts under CEQA are largely at the discretion of the acting agency.

Examples of projects in Palm Springs that have considered Casey's June beetle under

CEQA and still proceeded with impacts are:

10. Pintura, 13 acres, completed (no. 38 in City of Palm Springs 2003 reference)
11. Friend Development, 6 acres, under construction (no. 26, City of Palm Springs 2003)
12. Acanto Drive, 24 acres, graded (no. 24, City of Palm Springs 2003)
13. Palm Canyon LLC, El Portal, 34 acres, partially graded (no. 29, City of Palm Springs 2003)
14. Palm Canyon LLC, Monte Sereno, 41 acres, entitled (no. 30, City of Palm Springs 2003)
15. Canyon South Golf Course, 3 acres of new impact, graded (nos. 106-108, City of Palm Springs 2003)

Despite the provisions of CEQA applicable to the beetle, not all projects address the species. Examples in Palm Springs in Carsitas series or potentially suitable soils that may not have considered the beetle in their environmental review include:

16. Mountain Gate, 83 acres, under construction
17. Palm Springs East, 22 acres, entitled
18. Palm Springs West, 42 acres, entitled
19. Desert Aids, 7 acres, entitled
20. Multi Family Residential at Miraleste, 2 acres, under construction
21. Arenas 48, 4 acres, under construction
22. Coyote Run, 7.7 acres, entitled
23. Alejo Vista, 3.5 acres, complete
24. Tierra Hermosa, 8.8 acres, entitled
25. Palm Canyon Townhomes, 2 acres, entitled
26. Palm Springs Modern Homes LLC, 3.5 acres, entitled
27. Baristo Gardens, 4 acres, entitled

Urban development in the City of Palm Springs can be reviewed under CEQA but generally is not reviewed under the National Environmental Policy Act (NEPA). In contrast, development on tribal lands is considered to be exempt from CEQA but follows NEPA review and compliance guidance. Projects on tribal lands with impacts to the beetle have not always considered the species in their NEPA review/disclosure, regardless of public requests. For example, the following projects did not or do not propose to review impacts to the beetle:

28. Agua Caliente Tribal Building 6.5 acres, under construction
29. Section 14 Brush Management Plan, Environmental Assessment under preparation

Two multi-species habitat conservation planning efforts (Habitat Conservation Plan/Natural Community Conservation Plan [HCP/NCCP]) are in stages of development in the Palm Springs area. HCP/NCCPs are plans under federal and state law that allow simultaneous planning for development and for conservation. They may include species

not listed under federal or state law at the time of the plan. However, at present, both the CVAG plan and the Agua Caliente Band of Cahuilla Indians plan have declined to cover the beetle. Neither plan is complete or certain of implementation at this time.

*E. Other Natural or Human-Caused Factors*

Lights are a significant threat to the continued existence of Casey's June beetle. Male beetles are readily attracted to artificial lights (Hovore 1995, 1997b; CVAG 2001a, b), which draws time and energy from mate-finding and mating behavior. How long they remain captivated by artificial lights has not been quantified. Beetles may be injured in flying around lights (Eisenbeis 2002), and are subject to increased predation by bats and other predators–e.g., nighthawks (Chordeiles sp.), owls, and even ground predators (e.g. mice, raccoons) if the beetles become stunned or disoriented and fall to the ground. The Smoke Tree Ranch population of the beetle is virtually surrounded by development, and the Bogert Trail population has development encroaching. Hovore (1997b) believed beetle populations in small, isolated habitat fragments slowly decline genetically and numerically due to annual loss of a substantial portion of the population to lights and pools in surrounding developed areas. Such impacts may be preventable. Eisenbeis and Hassel (1999) found that sodium lamps attract half the insect activity at mercury lamps in Germany, and an ultraviolet filter reduced insect attraction by another three-quarters.

Pools also attract beetles and cause substantial mortality (Hovore 1997b, CVAG undated, CVAG 2001a, Cornett 2000, Barrows & Fisher 2000). Numbers of drowned male beetles may regularly be found in pool skimmers around remaining population areas during the flight season. Conscientious use of pool covers during spring evenings could reduce this threat.

The loss and fragmentation of habitat compromises the ability of the beetle to disperse and establish new populations or augment declining ones. Especially since females have never been observed to fly and males alone cannot establish new populations, the beetle's populations are isolated, with little or no chance of migrating to new sites or re-colonizing former sites if local conditions become unfavorable.

It is not known at present whether pesticide uses or toxins threaten the beetle. The beetles may be particularly sensitive to chemicals that interfere with neural or chemosensory functions during the flight season when males are seeking to locate females by their pheromones.

Flying beetles–and occasionally crawling ones–may be killed or injured by vehicles (especially at speeds greater than 25 mph) on roads busy around dusk in the springtime. This effect may be aggravated by attraction of male beetles to lights (Hovore 1997b). Since all remaining populations of the beetle are in an urbanized/urbanizing area, this impact may be significant. However, no data are available on the number of beetles affected.

The low numbers of Casey's June beetle make it vulnerable to risks experienced by

small, restricted populations. Elements of risk that are higher in very small populations include: (1) chance demographic effects (e.g., skewed sex ratios, high death rates or low birth rates); (2) the effects of genetic drift (random fluctuations in gene frequencies) and inbreeding (mating among close relatives); and (3) deterioration in environmental quality (Gilpin and Soule´ 1986) (e.g., increased artificial lighting, pools, wash channelization). Genetic drift and inbreeding may lead to reductions in the ability of individuals to survive and reproduce (i.e., reductions in fitness) in small populations. In addition, the lower genetic variation present in small populations makes a species less able to persist through future environmental challenges.

Having only two population locations and restricted habitat also makes Casey's June beetle susceptible to extinction or extirpation from all or a portion of its range due to chance events such as fire, flood, drought, or disease (Shaffer 1981, 1987; Primack 1998).

**Reasons for Emergency Determination**

The immediate threats to the entire range and total population of the beetle from imminent development projects in and adjacent to Palm Springs, as detailed above, constitute an emergency posing significant risk of extinction of the species. Therefore, pursuant to section 4(b)(7) of the Act and 50 CFR 424.20, the Secretary is empowered to list Casey's June beetle on an emergency basis without delay; and we urge that action. Without emergency listing, Casey's June beetle may be expected to be rendered extinct or placed beyond reasonable feasibility of recovery in less than the time required for normal rule-making procedures.

The emergency listing must be immediately effective to clearly indicate that property owners must not destroy beetle populations, which otherwise would not be prohibited before a listing took effect. Beetle populations can be decimated or destroyed merely by heavy ground disturbance (deep grading or disking) or paving.

**Critical Habitat Designation**

While collecting may pose a threat to the beetle, critical habitat designation is still prudent and beneficial for the species, since:

> remaining localities of the beetle are a matter of public record, and can even be found on the world-wide web.
>
> special notice and consideration (such as is provided by critical habitat designation) is needed for suitable habitat that is unoccupied–or used by the beetle at such low densities that it may be interpreted as unused–where the habitat is important for recovery, perhaps including reintroduction of the beetle.

**CONCLUSION**:

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the species, and have determined that Casey's June beetle is imminently in danger of extinction throughout all of its range. We are concerned about Casey's June beetle because of the extremely small number and reduced distribution of populations, rapid development and habitat loss, habitat fragmentation, and significant decrease in its habitable range in and around Palm Springs, California. This species is threatened by the following factors: habitat destruction, degradation, and fragmentation due to urban, residential, and recreational development; ground disturbance or vegetation removal, for example from grading, ripping, or off-road driving; impacts from artificial lighting, swimming pools, channelization, collecting, road kill, inadequate regulatory mechanisms, and the elevated extinction risks common to greatly reduced populations. These factors could severely impact Casey's June beetle by killing individuals, reducing or degrading available habitat, reducing and further fragmenting already small populations, and interfering with reproduction. Because of its limited range and population this species is also vulnerable to chance demographic, genetic, and environmental events. The combination of only two populations, small range, and little remaining habitat within the range makes the species highly susceptible to extinction due to urban development and random events such as fire, drought, disease, or other occurrences (Shaffer 1981, 1987; Meffe and Carroll 1994, Primack 1998). Casey's June beetle meets the Act's definition of endangered and warrants protection under the Act. Threatened status would not accurately reflect the diminished status and the threats to this species; the species warrants listing as endangered.

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