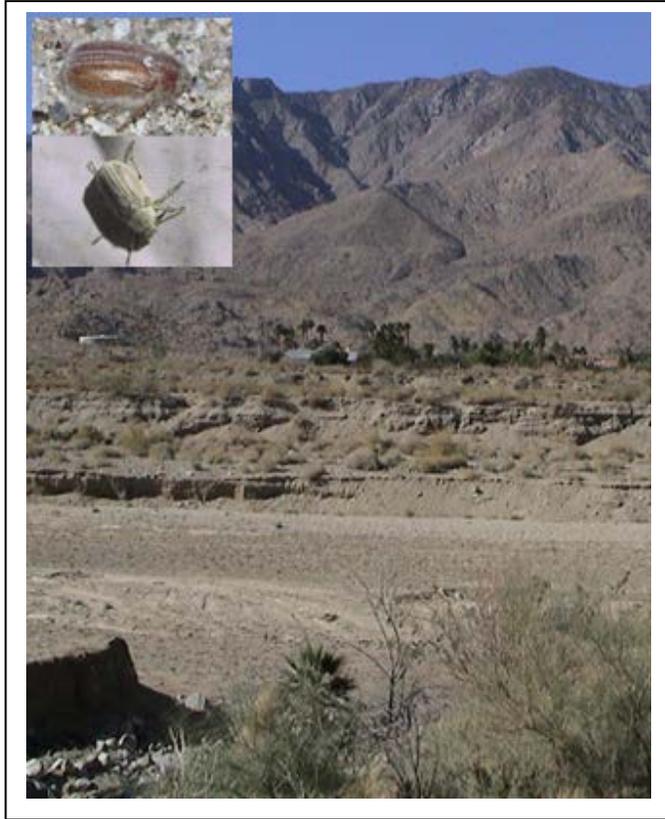


# Recovery Outline for Casey's June Beetle—March 2013

**U.S. Fish & Wildlife Service**

## Recovery Outline for Casey's June Beetle (*Dinacoma caseyi*)



Casey's June beetle (*Dinacoma caseyi*) habitat in Palm Canyon (Photo credit: Alison Anderson, USFWS). Casey's June beetle female (small upper photo) and male (small lower photo) (Photo credit: Felicia Sirchia, USFWS).

<b>Common Name:</b>	Casey's June Beetle
<b>Scientific Name:</b>	<i>Dinacoma caseyi</i>
<b>Listing Status:</b>	Endangered; September 22, 2011 (76 FR 58954)
<b>Critical Habitat Designation:</b>	September 22, 2011 (76 FR 58954)
<b>Lead Agency/Region:</b>	U.S. Fish and Wildlife Service, Pacific Southwest Region
<b>Lead Field Office:</b>	Carlsbad Fish and Wildlife Office 6010 Hidden Valley Road, Suite 101 Carlsbad, CA 92011 760-431-9440
<b>Approved:</b>	March 2013

# Recovery Outline for Casey's June Beetle—March 2013

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## **Purpose of the Recovery Outline:**

This document lays out a preliminary course of action for the survival and recovery of Casey's June beetle (*Dinacoma caseyi*). It is meant to serve as interim guidance to direct recovery efforts and inform consultation and permitting activities until a comprehensive draft recovery plan has been completed. Recovery outlines are intended primarily for internal use by the U.S. Fish and Wildlife Service (Service), and formal public participation will be invited upon the release of the draft recovery plan. However, we will consider any new information or comments that members of the public may wish to offer in response to this outline during the recovery planning process. For more information on Federal survival and recovery efforts for Casey's June beetle, or to provide additional comments, interested parties may contact the lead field office, Carlsbad Fish and Wildlife Office, for this species at 6010 Hidden Valley Road, Suite 101 Carlsbad, CA 92011, phone 760-431-9440.

## **Scope of Recovery and Available Information:**

The scope of this recovery outline is a single species, Casey's June beetle; however, many of the actions recommended in this outline that contribute to the conservation of Casey's June beetle are ecosystem-based. This recovery outline is based on the best available scientific information contained in the listing and critical habitat rule (USFWS 2011) and information in our files. Most of the major threats to the species are attributed to development and associated habitat modifications. While some research has been conducted on Casey's June beetle, little information is available beyond current status and existing threats. Additional research is needed to fully understand what is required for the recovery of this species, especially with regard to management actions that can be implemented to ensure that habitat suitability is maintained and enhanced throughout the species' range. Uncertainties associated with feasible management actions and biology will be resolved to the extent possible through the course of the recovery process and may result in modifications to the Service's recovery strategy over time.

# Recovery Outline for Casey's June Beetle—March 2013

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## I. Recovery Status Assessment

### A. BIOLOGICAL ASSESSMENT

It is our intent to discuss in this recovery outline only those topics directly relevant to Casey's June beetle needs for persistence and recovery under the Endangered Species Act (Act), as amended (16 U.S.C. 1531 *et seq.*). The genus *Dinacoma* and approximately 90 other genera constitute the New World members of the subfamily Melolonthinae (i.e., May beetles, June beetles, and chafers) of the scarab beetle family (Scarabaeidae) (Smith and Evans 2005). Casey's June beetle (*Dinacoma caseyi*) and *D. marginata* are the only two species currently known in the genus (Evans and Smith 2009, p. 44). For additional information on the taxonomy, biology, and ecology of Casey's June beetle, refer to previous documents published in the **Federal Register (FR)**, including the 90-day finding (71 FR 44960, August 8, 2006), 12-month finding (72 FR 36635, July 5, 2007), proposed listing and critical habitat rule (74 FR 32857, July 9, 2009), and the final listing and critical habitat rule (76 FR 58954, September 22, 2011). These documents are available on the Internet at <http://ecos.fws.gov/ecos/indexPublic.do>.

#### 1. Species Description and Life History

Limited information is available regarding Casey's June beetle life history. Based on surveys conducted to assess the species' presence, both male and female Casey's June beetles emerge from underground burrows between late March and early June, with abundance peaks generally occurring in April and May (Duff 1990, p. 3; Barrows 1998, p. 1). Male emergence holes and females have been observed in relatively disturbed, sandy wash areas and semi-developed areas beneath nonnative vegetation (Hawks 2010, pers. comm.; Anderson 2012, p. 1). Females are flightless (Duff 1990, p. 4; Hovore and Associates 1995, p. 7; Hovore 2003, p. 3), emerging only briefly at dusk to mate and then re-entering the ground, presumably to deposit eggs. Males flying in the area are attracted to females by pheromones (Cornett 2004, p. 5), sometimes even prior to complete emergence of the female (Duff 1990, p. 3; Anderson 2012, p. 1). Adults can be locally abundant at high density sites during optimal environmental conditions, with over 100 individuals being attracted to a black light trap in a single evening (Powell 2003, p. 4; Anderson 2012, p. 1), while in low density areas or under poor environmental conditions they can be difficult to detect. The larval life-stage of Casey's June beetle has not been well-studied. We believe that the larval cycle for the species is likely 1 year, based on the absence of larvae (grubs) in burrows during the adult flight season (La Rue 2004, p. 1). We do not know what the subterranean larvae feed on; although data indicate they do not feed on the roots of any particular species of host plant (D. Hawks 2010, Hawks Biological Consulting, pers. comm.).

There have been no formal or published scientific studies of Casey's June beetle life history, population size, population distribution, population dynamics, or individual movement. It is not likely this species would display metapopulation dynamics, as the flightless females cannot emigrate to isolated habitat areas where a new sub-population could be established. Because they fly, it can be assumed males are primarily responsible

## Recovery Outline for Casey's June Beetle—March 2013

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for genetic mixing within the one known extant population (and historically among populations). Soils that are modified, compacted, or too isolated for females to recolonize by crawling are not likely to support persistent occupancy. We do not know if females disperse at all; reported observations of females are limited to presence, and emergence to mate followed by re-entering the soil within minutes of mating (for example, Anderson 2012, p. 1).

Casey's June beetle is prey for some species, especially birds. Nighthawks were observed to be feeding in close proximity to where males were emerging en-mass from Palm Canyon Wash (Anderson 2012, p. 2). A large flock of crows (approximately 50) was also observed probing the sand with their beaks in the wash at dusk during mid-April where females are common near the soil surface, (J. McBride 2012, USFWS, pers. comm.).

### **2. Historical and Current Distribution and Abundance**

The known historical distribution of Casey's June beetle included alluvial fan (a fan-shaped deposit of sediment built up by stream and debris flow) and river wash areas within Palm Springs, and similar habitats south to the City of Indian Wells (Figure 1). Most locality information on Casey's June beetle specimens in collections specifies "Palm Springs," or simply Riverside County (Duff 1990, p. 2; O'Brian 2007, p.1; Ratcliff 2007, p. 1; Wall 2007, p.1). The majority of specimens (19 of 21) in the Los Angeles County Natural History Museum (LACNHM; 1940 to 1989) were labeled as being from Palm Springs. Other early collection records identify "Palm Desert" ("old record"; Duff 1990, p. 3), "Indian Wells" (two specimens in the LACNHM from 1953), and "Palm Canyon" (Duff 1990, p. 3), all in the western Coachella Valley east of the San Jacinto Mountains. Duff (1990, p. 2) described two primary areas where the beetle was extant in Palm Springs, west of the city near Tahquitz Creek (Figure 1). Hovore and Associates (1995, p. 4) described the possible extent of the species' historical range as "somewhere around Chino Canyon floodplain (or at most northwest to the Snow Creek drainage), south to around Indian Wells." Within this general geographic area from north to south of Palm Springs (Riverside County, California), the species is assumed to have occurred on alluvial fan bases flowing from the San Jacinto Mountains, at or near the level contour line, where finer silts and sand are deposited.

Casey's June beetle's current known range is limited to southern portions of Palm Springs, generally associated with Palm Canyon Wash (Figure 2). Based on male movement potential and occupied habitat distribution we have determined there is likely only one remaining population located within Palm Springs.

## Recovery Outline for Casey's June Beetle—March 2013

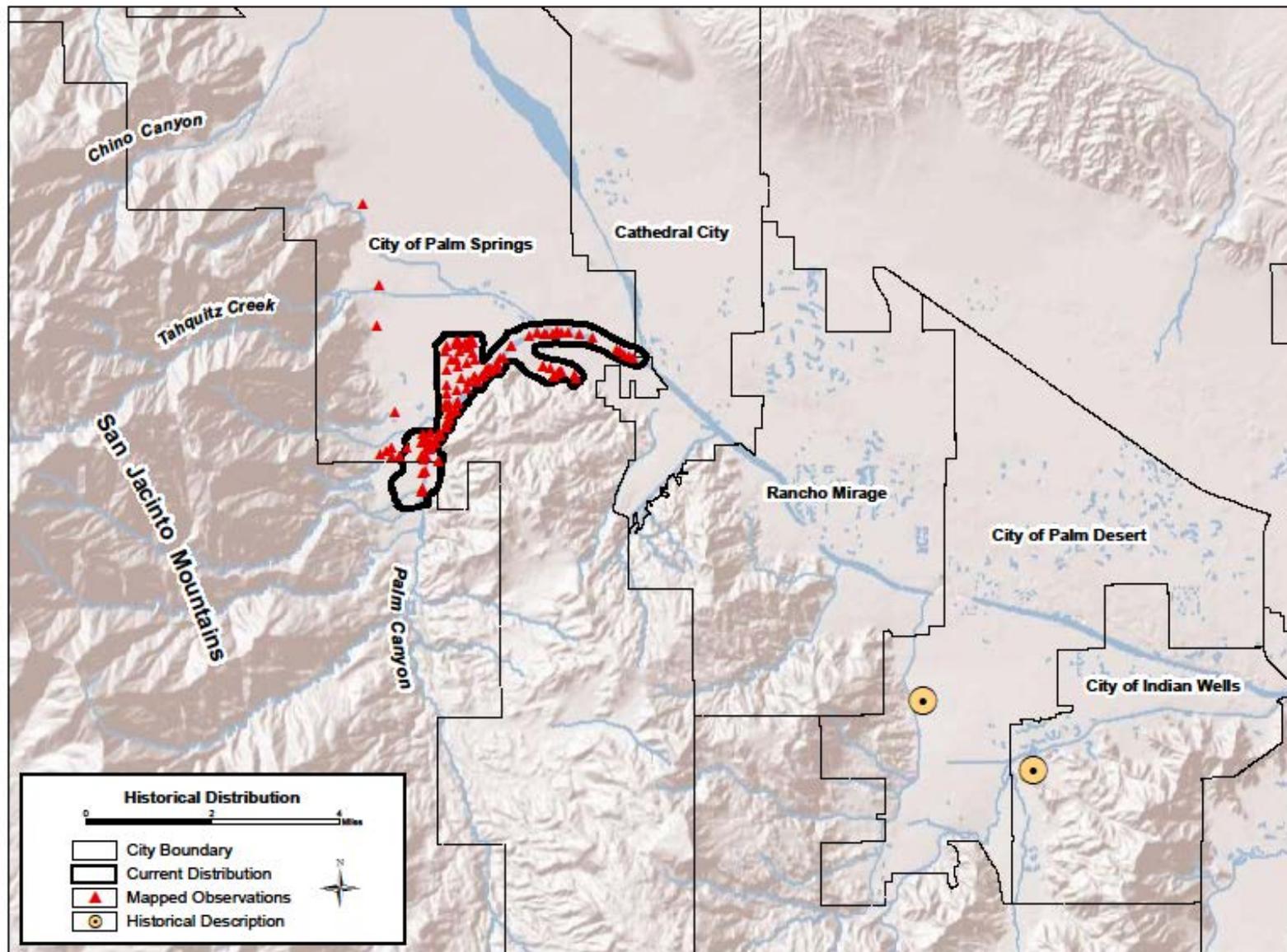


Figure 1. Casey's June beetle (*Dinacoma caseyi*) historical distribution. Historical sites included alluvial fan and river wash areas within Palm Springs, and similar habitats south to Indian Wells.

## Recovery Outline for Casey's June Beetle—March 2013

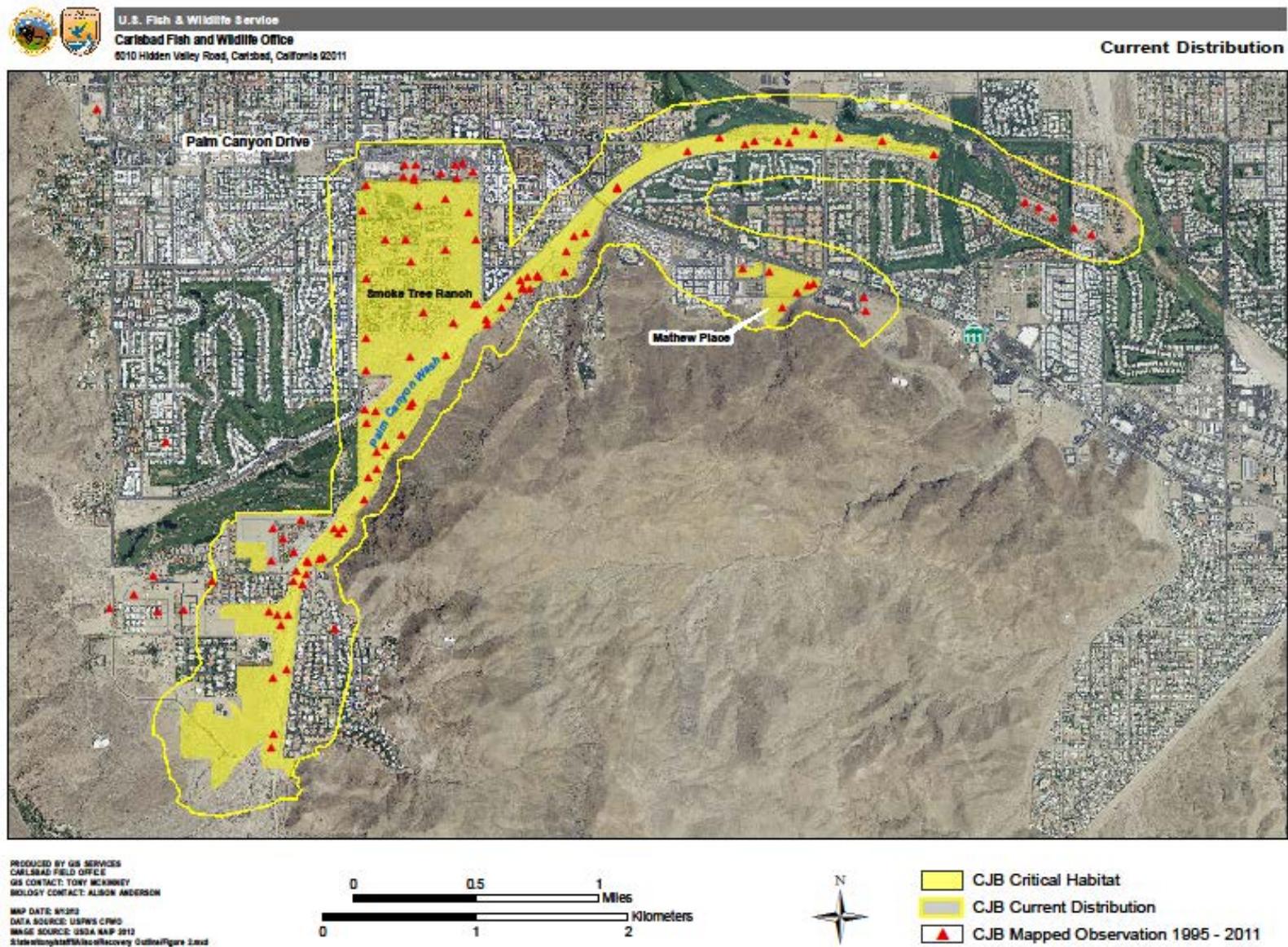


Figure 2. Casey's June beetle (*Dinacoma caseyi*) current distribution and critical habitat.

### 3. Habitat Description

Our knowledge of Casey's June beetle habitat characteristics is primarily based on correlation of known, mapped environmental features with species occupancy. Therefore, described habitat characteristics include soils type, slope aspect, elevation, vegetation type, and hydrologic information. Historically, Casey's June beetle was associated with native Sonoran (Coloradan) desert vegetation located on desert alluvial fans and bajadas (compound alluvial fans) at the base of the San Jacinto Mountains. These areas include sandy dry washes with ephemeral flow, and dry upland areas associated with soil deposition from extreme flood events.

Casey's June beetle is most commonly associated with Carsitas series soil (CdC), described by the U.S. Department of Agriculture (USDA) (USDA on-line GIS database, 2000) as gravelly sand on 0 to 9 percent slopes. This soil series is associated with alluvial fans, rather than areas of aeolian or windblown sand deposits. Hovore (2003, p. 2) described soils where Casey's June beetle occurs or occurred historically as, "...almost entirely Carsitas series, of a CdC type, typically gravelly sand, single grain, slightly effervescent, moderately alkaline (pH 8.4), loose, non-sticky, non-plastic, deposited on 0 to 9 percent slopes. On alluvial terraces and where they occur within washes, these soils show light braiding and some organic deposition, but [most years] do not receive scouring surface flows." Casey's June beetle has primarily been found on CdC and Riverwash (RA) soils, and also some Carsitas cobbly sand (ChC) soils (Anderson and Love 2007, p. 1). Its burrowing habit would suggest the Casey's June beetle needs soils that are not too rocky or compacted and difficult to burrow in. Occupied habitats such as unprotected vacant lots and wash areas are often characterized by an intermediate level of disturbance, and may include a relatively high cover of nonnative plant species (Hawks 2011, pers. comm.).

Hovore (2003, p.11) and Cornett (2004, p. 14) hypothesized that upland habitats provide core refugia from which the species recolonizes wash habitat after intense flood scouring events (approximately every 10 years), and are required for long-term survival of the species. The wash habitat east of State Route 111 that is isolated from upland refugia, and isolated habitat patches, such as the Mathews Place location (Figure 2), are important for recovery because they support a relatively large proportion of the remaining population, and would be an important source population for future reintroduction and augmentation activities.

Smoke Tree Ranch (Figure 2), a gated residential community adjacent to Palm Canyon Wash, supports a large proportion of the known extant population. With respect to the occupancy and current habitat conditions at Smoke Tree Ranch, Cornett (2004, p. 14) hypothesized that Casey's June beetle had "survived primarily because of the unique qualities of the ranch environment with its large open spaces and relatively undisturbed vegetation... The most viable habitat for the beetle is Smoke Tree Ranch where environmental perturbations are minimal." We believe it is possible that irrigation at Smoke Tree Ranch also mimics soil moisture levels found in the wash itself, and may

## Recovery Outline for Casey's June Beetle—March 2013

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even enhance habitat conditions. Considering the potential effects of irrigation at Smoke Tree Ranch, and the potential for high species density observed in Palm Canyon Wash, we believe that irrigation may be used as a tool in the remaining habitat with appropriate soil types (CdC or RA) in southern Palm Springs for conservation of the species. If supported by future research, this could hold the key to effective management for Casey's June beetle in remaining upland habitats where the species has been extirpated.

All known occupied habitats are within the jurisdiction of Palm Springs and the Agua Caliente Band of Cahuilla Indians. Land ownership is primarily private and tribal, although most wash areas are owned by the Riverside Flood Control and Water Conservation District. The only protected occupied area for the species is an approximately 126.8 acres (ac) (51.3 (ha) hectares) section of Smoke Tree Ranch where there is a conservation easement and ongoing compliance monitoring.

### 4. Summary Biological Assessment

Casey's June beetle has a very limited distribution, an extremely limited ability to disperse, and a limited number of unoccupied habitats suitable for reintroduction and management. Expanding, and perhaps even maintaining, the current species' range will require moving females into unoccupied habitat or augmenting declining areas. The primary challenge for recovery of this species will be protection and management of occupied and formerly occupied habitats that are not currently conserved. More information regarding the biology of immature stages will also greatly assist management of habitats for recovery.

### B. THREATS ASSESSMENT

#### 1. Listing Factors/Primary Threats to the Species

As identified in the final rule (76 FR 58954, September 22, 2011), the primary threats to Casey's June beetle are: destruction, modification, and fragmentation of habitat; increased intensity and frequency of catastrophic flood events; environmental effects resulting from changing climatic patterns; loss of individuals due to soil disturbing activities; and loss of individuals due to attraction to light sources. A summary of these threats is presented below (please see the final rule for a complete threats analysis (76 FR 58954, September 22, 2011)); each is classified according to the five factors identified in section 4 of the Act (16 USC 1531 *et seq.*).

##### a. The present or threatened destruction, modification, or curtailment of its habitat or range (Factor A)

Commercial and residential development are the greatest threats to habitat in the upland CdC soils that are believed to support Casey's June beetle. LaRue (2006, University of California at Riverside, pers. comm.) emphasized the magnitude of development threats to *Dinacoma* spp. population survival: "Most *Dinacoma* [spp.] have experienced range reduction because of unprecedented habitat destruction and modification for recreational, residential, and urban development

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resulting in serious distributional fragmentation throughout [their] former already naturally limited ranges. Consequently, several populations [of the genus *Dinacoma*] have been extirpated; especially those that once existed in Los Angeles County (for example, Glendale, Eaton Canyon).”

General location descriptions from early collection records were used to determine the historical range of Casey's June beetle (see discussion in the 90-day finding (71 FR 44962; August 8, 2006)). Soils data from this analysis were used to estimate that 97 percent of the historical range of Casey's June beetle has been converted to residential and commercial development. Although habitat fragmentation and loss due to development has slowed since 2005 (likely due to the economic downturn), the wash and associated occupied habitat areas are subject to flood control activities such as sand removal and levy and detention basin construction. Therefore, we anticipate additional upland habitat for the beetle may be impacted or lost in the near future due to requirements for flood control operations to maintain health and safety. These activities may impact conservation of Casey's June beetle into the future.

### **b. Inadequacy of existing regulatory mechanisms (Factor D)**

The listing rule stated that, absent listing under the Act, existing regulatory protection was inadequate. Existing regulatory mechanisms that could provide some protection for Casey's June beetle include: (1) Federal laws and regulations; (2) State laws and regulations; and (3) local land use processes and ordinances (for example, tribal environmental policies). However, these regulatory mechanisms were not preventing continued habitat modification and fragmentation prior to listing. There are no regulatory mechanisms that address the management or conservation of habitat for Casey's June beetle. Occupied areas are better protected under section 9 of the Act now that the species has been listed, and areas designated as critical habitat (Figure 2) are better protected from impacts due to actions authorized, funded, or carried out by Federal agencies. However, other habitats important to recovery are still vulnerable to development and habitat modification. As discussed above in the **Summary Biological Assessment** section, the primary challenge for recovery of this species will be protection and management of occupied and formerly occupied habitats that are not currently conserved.

### **c. Other natural or manmade factors affecting its continued existence (Factor E)**

Casey's June beetle continues to be impacted by threats to the individual including increased intensity and frequency of catastrophic flood events; environmental effects resulting from changing climatic patterns; loss of individuals due to foot, vehicle, and horse traffic and other soil disturbing activities; and loss of individuals due to attraction to pools and light sources. Lights attract male beetles away from habitat and females resulting in wasted energy, and they are frequently trapped and die in lights that have broken covers (K. Osborne 2012, pers. comm.). Any additional development within or adjacent

## Recovery Outline for Casey's June Beetle—March 2013

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to Casey's June beetle habitat will likely increase traffic into occupied areas and include external lighting and swimming pools. Impacts from these threats may result in additional losses and will continue to adversely affect the existing population.

In addition to a restricted range and small population size, Casey's June beetle has limited dispersal capabilities (Hovore 2003, p. 3). These conditions likely increase the degree of threat due to chance events, such as extreme floods or drought (Lande *et al.* 2003, pp. 34 and 35).

We concluded in the listing rule from available information that climate change is likely to reduce Casey's June beetle population densities by increasing severe scouring flood events and decreasing soil moisture levels. Increased winter runoff and severe scouring flood events in Palm Canyon Wash are anticipated because the increasing frequency and severity of extreme storm events (Cayan *et al.* 2005, pp. 7–8; IPCC 2007, pp. 8–9; Dettinger 2009, pp. 514 and 518) causes more concentrated rainfall (and consequently less moisture absorption by the soil). Decreased total rainfall, increased evapotranspiration due to increased temperatures (The Nature Conservancy, Climate Wizard: [www.climatewizard.org](http://www.climatewizard.org)), and increased winter runoff (discussed above) may all decrease soil moisture levels.

### 2. Summary Threats Assessment

The threats posed by habitat loss and modification are the greatest impediments to recovery. Development of formerly occupied habitats, impacts to occupied habitat from adjacent developed areas, human activities and natural events (such as flood or drought) with potential to cause adult mortality are threats of moderate magnitude but imminent throughout the majority of the species' limited range. Smoke Tree Ranch affords protection from existing threats to approximately 126.8 acres (ac) (51.3 (ha) hectares) where there is a conservation easement and ongoing compliance monitoring. Additional protection of occupied and undeveloped formerly occupied habitats is necessary for recovery.

### C. CONSERVATION ASSESSMENT

#### 1. Conservation Efforts

##### *Service-permitted research activities*

Since listing, six individuals have been issued 10(a)1(A) recovery permits for presence-absence surveys. Three permittees undertook surveys in 2012; Jim Cornett did exploratory surveys outside the known range (see description below under *Agua Caliente Band of Cahuilla Indians*), Michael Wilcox conducted a project-based survey, and Ken Osborne demonstrated to Service staff the efficacy of different light trapping techniques and documented natural history information (Anderson 2012, p 1).

## Recovery Outline for Casey's June Beetle—March 2013

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### *Smoke Tree Ranch, Inc.*

Prior to listing, the only protection afforded Casey's June beetle was an established conservation easement and monitoring program at Smoke Tree Ranch. This conservation easement with compliance monitoring will remain in place and continue to protect this occupied habitat area in the future. The Palm Springs Fish and Wildlife Office approved the Ranch's Habitat Conservation Plan and issued an incidental take permit to Smoke Tree Ranch, Inc., on August 23, 2012, which further strengthens protection of the species at this location by protecting in perpetuity an additional 13.26 ac (5.37 ha) of occupied, suitable habitat for Casey's June beetle.

### *Agua Caliente Band of Cahuilla Indians*

In 2012 the Service provided funding to the Agua Caliente Band of Cahuilla Indians to fund exploratory surveys outside of the recommended survey area map for 10(a)1(A) permittees. The purpose of these surveys was to expand surveys beyond the current known species range, to determine if any relict populations persist within the historical range (south to Palm Desert) or even farther south. Results from this effort are not yet available.

## **2. Summary Conservation Assessment**

Casey's June beetle is dependent on habitat that has been, and continues to be, under development pressures. Its habitat requires protection and active management to improve and restore suitable habitat in order to prevent further decline and to enable recovery of the species. The only occupied habitat area that is afforded permanent protection from existing threats is within Smoke Tree Ranch (approximately 126.8 ac (51.3 ha)) where there is a conservation easement and ongoing compliance monitoring. The Smoke Tree Ranch Habitat Conservation Plan comprises approximately 22 percent of designated critical habitat. Additionally, research, monitoring, and habitat restoration should be initiated in patches of remaining habitat throughout the species' historical range. Key challenges will be to develop a recovery strategy that can be implemented in a system where there is continuing development pressure and requirements for flood control operations to maintain human health and safety.

## **D. SUMMARY OF RECOVERY STATUS AND NEEDS**

Historical Casey's June beetle habitat has been drastically degraded and fragmented, resulting in the species' reduced geographic range and vulnerability to stochastic events. Known life history traits and habitat requirements of the species are conducive to re-colonization, but assisted movement of flightless females and continued management is necessary for recovery of the species. Casey's June beetle is dependent on habitat that has been, and continues to be, under developmental pressures. Its habitat requires active management to improve and restore suitable habitat in order to prevent further decline of the species. Additionally, research and monitoring should be initiated throughout the

## Recovery Outline for Casey's June Beetle—March 2013

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species' range. Some of the information that is needed to better plan for recovery needs includes better understanding of female and male movement potential, larval diet, impacts of disturbance to sub-surface individuals, and viable population size. Key challenges will be developing a recovery strategy that can be implemented in a system where there is limited available habitat, continuing development pressure, and requirements for flood control operation to maintain human health and safety.

## II. Preliminary Recovery Strategy

### A. RECOVERY PRIORITY NUMBER

Casey's June beetle is assigned a recovery priority number of 11C on a scale of 1C (highest) to 18 (lowest), based on the moderate degree of threat, a low potential for recovery as stated above, its status as a full species, and conflict with development pressures (USFWS 1983a, b).

Much of Casey's June beetle habitat has been lost and there is currently only one extant population remaining. However, the degree of threat is considered moderate because the species would not face immediate extinction if recovery was temporarily held off. Habitat loss, fragmentation, and modification are considered manageable threats, but difficult to alleviate at this time because of existing development and development pressure. Continued management is needed to maintain currently occupied habitat. Recovery potential is considered low because the biological and ecological limiting factors are not well understood. Restoration of formerly occupied habitat patches and reintroduction of beetles may also be labor-intensive. The "C" indicates conflict with construction or other development projects that impacts habitat where Casey's June beetle occurs.

### B. RECOVERY VISION STATEMENT

We envision recovery for Casey's June beetle as stable populations, maintained within managed and conserved suitable habitat, with few barriers to dispersal to ensure gene flow and maximum dispersal of individuals. Where habitat connectivity is not possible, management will include movement of females to recolonize any habitat patches where the species is extirpated or to areas where they may become extirpated. Additional populations (discovered or reintroduced) within the species' historical range will be monitored and maintained to provide sufficient representation, resiliency, and redundancy across the species' range so that Casey's June beetle no longer requires the protections of the Act. Threats impacting the species will be sufficiently understood and abated to ensure long-term conservation of Casey's June beetle. A rangewide monitoring and adaptive management approach will be in place to address unforeseen events and threats.

### C. INITIAL ACTION PLAN

We recognize that the conservation of Casey's June beetle will not be achieved without extensive cooperation and coordination among many entities (primarily Smoke Tree Ranch, Inc., Riverside County Flood Control and Water Conservation District, Agua Caliente Band of Cahuilla Indians, City of Palm Springs, U.S. Army Corps of Engineers, and the Service). This action plan does not assign responsibility of any partner to undertake the recommended actions. However, we believe that working with Federal and local agencies and our other partners, while coordinating across the Service is essential to effectively conserve Casey's June beetle.

# Recovery Outline for Casey's June Beetle—March 2013

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Below, we outline the overall primary objectives of the recovery effort for Casey's June beetle and include both immediate and longer-term actions. These actions may be used to guide recovery planning, prioritize actions, minimize impacts from projects that may affect the species or its critical habitat, and plan for future recovery actions.

## 1. Primary Objectives

The recovery effort should build upon conservation and monitoring efforts indicated in detail above, and continue to build strong relationships with partners. The primary objectives for recovery will be to:

- a. Survey and monitor rangewide to accurately document the population distribution, occupied habitat, and local threats;
- b. Protect the existing population in Palm Springs through acquisition and protection of existing occupied habitat;
- c. Implement projects specifically designed to ameliorate threats and inform management actions for recovery of Casey's June beetle;
- d. Expand the current distribution through habitat restoration and species reintroduction.

## 2. Immediate Actions

The goal of the initial phase of recovery is to arrest and reverse the general population decline and protect the available suitable habitat and range occupied by Casey's June beetle. These are recommended actions to occur in the interim between completion of the recovery outline and the recovery plan. These immediate actions will inform future research, restoration, threats abatement, and other conservation actions:

- Continue to coordinate with local partners and stakeholders to: (1) gather existing historical hydrologic data (frequency and severity of flash floods); (2) identify existing areas with suitable habitat for Casey's June beetle; and (3) identify future information needs related to Casey's June beetle biology.
- Ensure persistence of individuals in occupied upland habitat designated as critical habitat within 0.25 mile (0.4 kilometer) of and contiguous with Palm Canyon Wash, and the designated critical habitat area ("Matthew Place") adjacent to State Route 111 through conservation easements, management, and cooperative planning with landowners, partners, and stakeholders.
- Design a rangewide monitoring scheme and begin its implementation throughout the current population distribution.
- Coordinate with local partners and land managers to educate the public on the impacts of recreational activities to active adult beetles during the mating season.
- Initiate activities to abate threats related to unauthorized off-highway vehicle use in Palm Canyon Wash.

## Recovery Outline for Casey's June Beetle—March 2013

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### 3. Long-term Comprehensive Actions

Although this list of actions will likely change during the recovery planning process as we learn more about the species, we recommend the following actions as a more comprehensive list using all available methods to lead to the conservation of Casey's June beetle. Specific actions that should be undertaken to meet the primary objectives are outlined below.

- a.** Survey and monitor rangewide to accurately document populations, occupied habitat, and local threats
  - Develop a rangewide population monitoring or survey protocol that will lead to a better understanding of life history strategies such as patterns of dispersal, growth, reproduction, and recruitment.
  - Conduct rangewide population monitoring of currently occupied watersheds.
  - Conduct rangewide monitoring and assessment of potentially occupied habitat within the historical range.
  - Monitor habitat to identify locations within or adjacent to currently occupied areas where habitat suitability can be improved (for example, by decreasing soil compaction and increasing summer soil moisture levels).
  
- b.** Protect all suitable habitats in Palm Springs within the current estimated population distribution. Ensure persistence of existing population through conservation easements, management in perpetuity, and cooperative planning with landowners, partners, and stakeholders.
  
- c.** Conduct research designed to inform management actions that would ameliorate or reduce current threats.
  - Develop a better understanding of the species' habitat requirements and environmental tolerances by documenting habitat conditions in currently occupied habitat, such as soil moisture, soil texture/compaction, water table depth, ground cover types, percent root volume per unit volume of soil, spring wind velocities correlated with adult mating activity, and the geographic distribution and frequency of such winds during the beetle's flight season.
  - Monitor the amount and velocity (intensity) of water flow during peak flood events, and the frequency of these events to determine if flood events result in mortality of subterranean Casey's June beetles in Palm Canyon Wash.
  - Characterize habitat conditions that may provide suitable food resources (i.e. investigating diet through examination of larval gut contents).
  - Investigate the impacts of suburban development on Casey's June beetle occupancy and persistence at Smoke Tree Ranch. Investigative approaches include determination of on-site environmental correlates, follow-up experimentation, and comparison with other occupied sites.
  - Determine if predation by ravens or crows is a threat to Casey's June beetle. Investigate whether Casey's June beetles are being consumed and if so, quantify the number of individuals consumed through documentation of

## Recovery Outline for Casey's June Beetle—March 2013

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foraging by flocks in occupied habitat during the flight season, and examination of bird gut contents.

- d.** Expand the current distribution by restoring and maintaining historically occupied habitat patches in Palm Springs (for example, restore former habitat in the Tahquitz creek area).
  - Determine if reintroduction and population augmentation are necessary and if so, develop a comprehensive plan to facilitate this process.
  - Develop a comprehensive plan for acquiring suitable sites and establishing additional populations.
  - Assess and prioritize areas that can be restored and made suitable for reintroduction of Casey's June beetle.
  - Develop habitat restoration and creation techniques.
  - Investigate techniques to translocate Casey's June beetles.

# Recovery Outline for Casey's June Beetle—March 2013

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## III. Preplanning Decisions

### A. RECOVERY PLAN DEVELOPMENT

The Carlsbad Fish and Wildlife Office will take the lead in the preparation of the draft recovery plan for Casey's June beetle pursuant to section 4(f) of the Act anticipated to begin in fiscal year 2014. It is not anticipated that a recovery team will be convened. However, we will seek input from all persons interested, or potentially affected by, recovery efforts for Casey's June beetle. Public comments received on this recovery outline will be taken into consideration during the preparation of the draft recovery plan. Public comment will be solicited on the draft recovery plan. The recovery plan will include objective, measurable criteria which, when met, would result in a determination that the species be removed from the Federal List of Endangered and Threatened Animals. Recovery criteria should address the five listing factors, including elimination or management of threats. Preparation of the recovery plan will be under the leadership of the Carlsbad Fish and Wildlife Office.

### B. INFORMATION MANAGEMENT

All information relevant to recovery of Casey's June beetle will be housed in administrative files found at the Carlsbad Fish and Wildlife Office in Carlsbad, California. The lead Fish and Wildlife Biologist will be responsible for maintaining the official record for the recovery planning and implementation process. Copies of new study findings, survey results, records of meetings, comments received, and other relevant information should be forwarded to this office (see Lead Field Office contact Information above).

Information needed for annual accomplishment reports, the Recovery Report to Congress, expenditure reports, and implementation tracking should be forwarded to the Carlsbad Fish and Wildlife Office (see Lead Field Office contact information). Copies of the completed reports can then be disseminated to all contributors upon request.

### C. PROPOSED RECOVERY PLAN SCHEDULE

Regional Office Review Draft	Anticipated Fiscal Year 2015
Public Review Draft	Anticipated Fiscal Year 2015
Public Comment Period	60 Days
Final Recovery Plan	Anticipated Fiscal Year 2016

### D. STAKEHOLDER INVOLVEMENT

We maintain active communications and coordination with all stakeholders and partners, especially with regard to research, land access, and project development.

## Recovery Outline for Casey's June Beetle—March 2013

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### Key stakeholders and partners:

- Smoke Tree Ranch, Inc.
- Riverside County Flood Control and Water Conservation District
- Agua Caliente Band of Cahuilla Indians
- University of California, Riverside
- U.S. Army Corps of Engineers
- Bureau of Land Management
- City of Palm Springs
- Coachella Valley Association of Governments
- Coachella Valley Conservation Commission

Landowners and land or resource managers who may contribute to or be affected by the listing and recovery of Casey's June beetle will be invited to participate in the recovery planning process. A mailing list will be maintained and the Carlsbad Fish and Wildlife Office, with the assistance of the Palm Springs Fish and Wildlife Office and will attempt to foster open and ongoing communications with all interested parties. Early in the recovery planning process, we will hold a meeting with interested stakeholders to exchange status information, allow stakeholders to both identify possible recovery issues and possible additional cooperators that could facilitate recovery efforts for this species. The information gathered from this discussion will be used by the Service to provide the initial platform to proceed with recovery planning. It will help identify private landowners who could participate in recovery efforts, and interested stakeholders will be asked to participate on an ongoing basis in the recovery planning and implementation effort. We will take advantage of all opportunities to interact with stakeholders in a productive and meaningful way.

Stakeholders will be afforded an opportunity to review and comment on a draft of the recovery plan in conformance with the Act. Stakeholders may also be asked to contribute directly by suggesting to the Service potential recovery implementation strategies for planned actions. Strong working relationships with experts and stakeholders will be maintained and developed over time with new stakeholders.

Approved:

  
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Regional Director, Pacific Southwest Region  
U.S. Fish and Wildlife Service

March 14, 2013  
\_\_\_\_\_  
Date

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