

West Valley
Habitat Conservation Plan
for the
Issuance of an Incidental Take Permit Under Section 10(A)(1)(B) of
the Endangered Species Act
for the Federally Endangered
Delhi Sands Flower-loving Fly Projects within
Colton, California of San Bernardino County

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SECTION 1: INTRODUCTION

1.1 - Background

Although cities within the Inland Empire have been affected by the down turn in the economy they are preparing for a return to normal conditions and must anticipate the need for commercial, industrial, and residential growth. In an effort to be prepared to support this growth while fulfilling its obligations to protect federally listed species under the Endangered Species Act (ESA), the City of Colton has identified sensitive biological resources within their boundaries. The federally endangered Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*, DSF), is the only federally listed species known to occur within the City of Colton north of the Interstate 10 (I-10) Freeway. Applicants for commercial, residential, and industrial development projects in the City of Colton with potentially suitable DSF habitat (Delhi sands soils), need to determine if the species is present within the project site. Two consecutive years of biological surveys with negative results are necessary to demonstrate presumptive absence of DSF. If DSF are detected, compliance with the Federal Endangered Species Act (FESA) is required. This is typically achieved through the development of an individual Habitat Conservation Plan (HCP) and the subsequent issuance of an incidental take permit under Section 10 of FESA. Completion of California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) reviews for the project are also required. This includes an analysis of the projects effects to natural and cultural resources and the development of avoidance, minimization and mitigation measures. This process is expensive and time consuming; potentially hindering the growth of a key business area in the City of Colton north of the I-10 freeway and a project by project approach to species conservation may not be an effective strategy.

To effectively address the presence of occupied and potentially suitable DSF habitat located in areas of the City of Colton north of the I-10 Freeway and south of San Bernardino Avenue, including the Colton's Hub City Centre (Specific Plan) area, while allowing planned development to proceed, the City is engaged in the formal process of developing a conservation program to permanently protect DSF populations in the area through the preparation of a proposed Habitat Conservation Plan (HCP). The HCP, once approved, will provide the necessary conservation of DSF, allowing the City to resume planned development of non-conservation areas within the HCP boundaries.

1.2 - Purpose of the Habitat Conservation Plan

This Habitat Conservation Plan, the West Valley Habitat Conservation Plan (HCP), has been prepared by the City of Colton (the applicant) in coordination with the U.S. Fish and Wildlife Service (USFWS) to fulfill the requirements of a Section 10(a)(1)(B) Permit application for proposed projects within DSF habitat within the City of Colton north of the I-10 Freeway. Through the development of a cooperative conservation strategy with USFWS, the City of Colton proposes to maximize the economic development potential for their community while also providing favorable conditions for DSF conservation. The proposed duration of the incidental take permit is 30 years, which is the time necessary for the City to fully fund and implement the conservation strategy of the HCP.

The USFWS's Recovery Plan (USFWS 1997) criteria for this species call for the permanent protection of at least four populations of DSF in the Colton Recovery Unit, two to the north and two to the south of the I-10 Freeway. The HCP will focus on preserving populations north of the I-10 Freeway. At least three populations are known to occur north of the I-10 Freeway, including those within the area proposed for Conservation under this HCP. While recognizing the value of DSF habitat within this area, the City of Colton also has to plan its economic viability for the short-term (the next 10 years) as well as the long term (over the next 30 years). The HCP addresses the short-term requirements for economic development of the City of Colton while continuing to accommodate the long-term survival of this species as described in USFWS's Recovery Plan.

While it is recognized that there is significant DSF habitat south of the I-10 Freeway in the City of Colton, much of this area is currently undeveloped, has an established 150-acre DSF conservation bank, the Colton Dunes Conservation Bank, that is providing long-term protection to DSF population(s) south of the I-10 Freeway, and is subject to several smaller, independent ongoing HCP efforts for the preservation of DSF habitat.

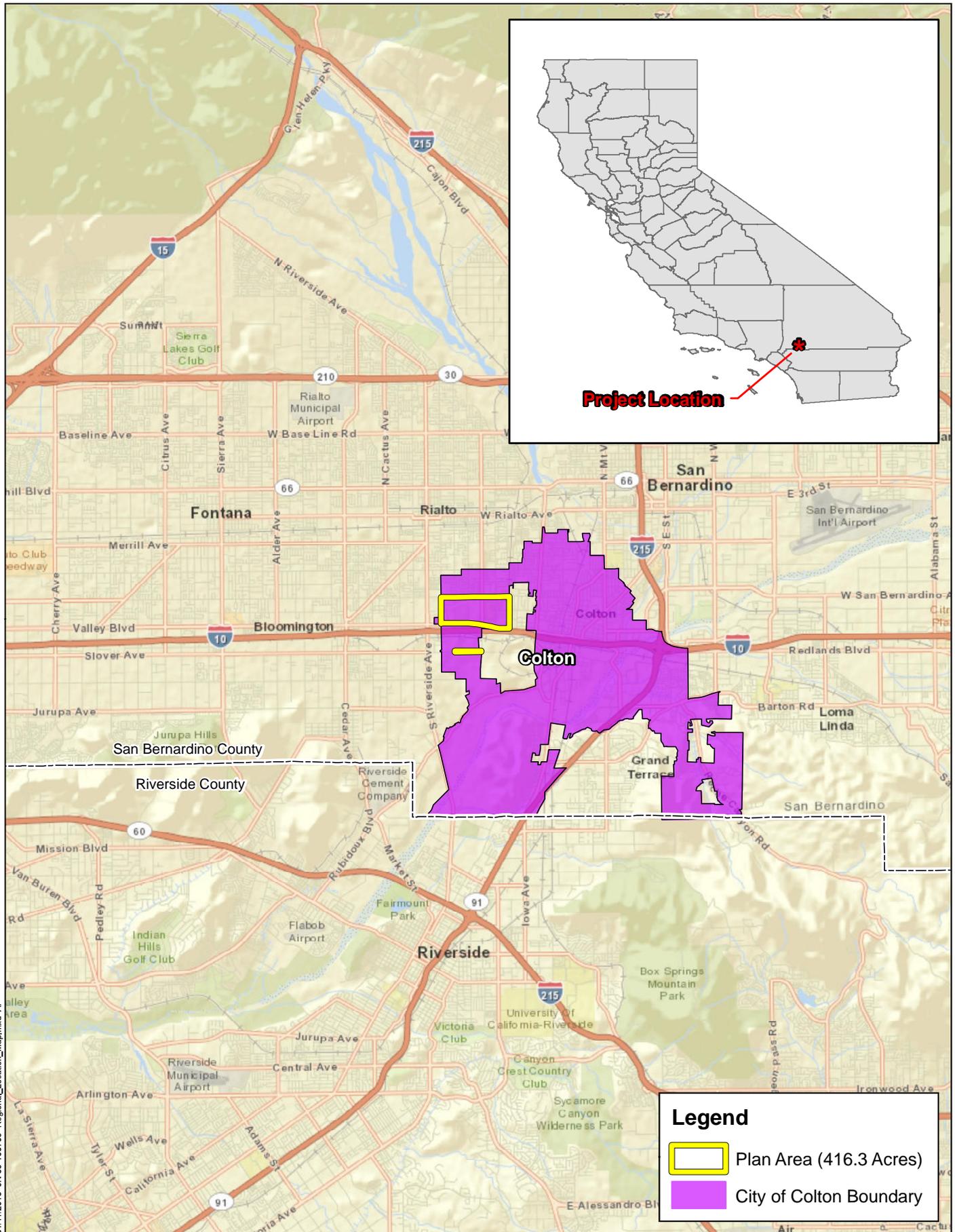
Without the cooperative approach presented in this HCP, it is both the City of Colton's and USFWS's opinion that the quality and expanse of DSF habitat within the City of Colton will continue to diminish. The preparation of this HCP serves two main purposes: 1) it sets forth a program for protecting natural resources while managing growth; and 2) resolving and implementing economic development opportunities for the City. More specifically, the City intends that this Plan will:

- Develop avoidance, minimization, and mitigation measures consistent with the Federal Endangered Species Act (FESA) that support the long-term conservation needs of the DSF, a federally endangered species.
- Proactively address requirements of FESA to ensure conservation of important natural resources while allowing for economic development activities in the West Valley HCP area. This will be accomplished by securing an incidental take permit for the take of DSF for Covered Activities north of the I-10 Freeway (described in Section 2).
- Provide a means to standardize avoidance, minimization and mitigation requirements that will lessen or avoid direct, indirect and cumulative impacts to DSF occurring within the City of Colton north of the I-10 Freeway.

1.3 - Scope of Plan

This HCP is restricted to approximately 416.3 acres of lands within the City of Colton, north of the I-10 Freeway and 5.8 acres encompassing a portion of East Slover Avenue south of the I-10 Freeway. Together, the two areas comprise the West Valley HCP area (Exhibit 1). Approximately 248.2 acres of the area north of the I-10 Freeway has been developed. Of the remaining area, approximately 148.5 acres is potentially suitable DSF habitat. While this HCP focuses on the development within the West Valley HCP area north of the I-10 Freeway, there are a number of related and complementary conservation efforts in the Colton Recovery Unit occurring south of the I-10 Freeway.

- Vulcan Conservation Bank
- Angelus Block HCP
- Alere Properties HCP
- Owl Property HCP
- Kinder Morgan HCP



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Legend

- Plan Area (416.3 Acres)
- City of Colton Boundary



Source: ESRI World Street Map, San Bernardino County GIS

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Regional Location Map

Although there is an obvious concentration of conservation efforts for DSF south of the I-10 Freeway, as evidenced by the number of HCP applications (completed and ongoing), most of these actions are independent of the City of Colton's economic and land use planning efforts and, therefore, outside the City's immediate land use authority. At the present time, it is the City of Colton's position that it must address the short-term economic goal of developing the West Valley HCP area before extending its land use management and conservation planning efforts south of the I-10 Freeway.

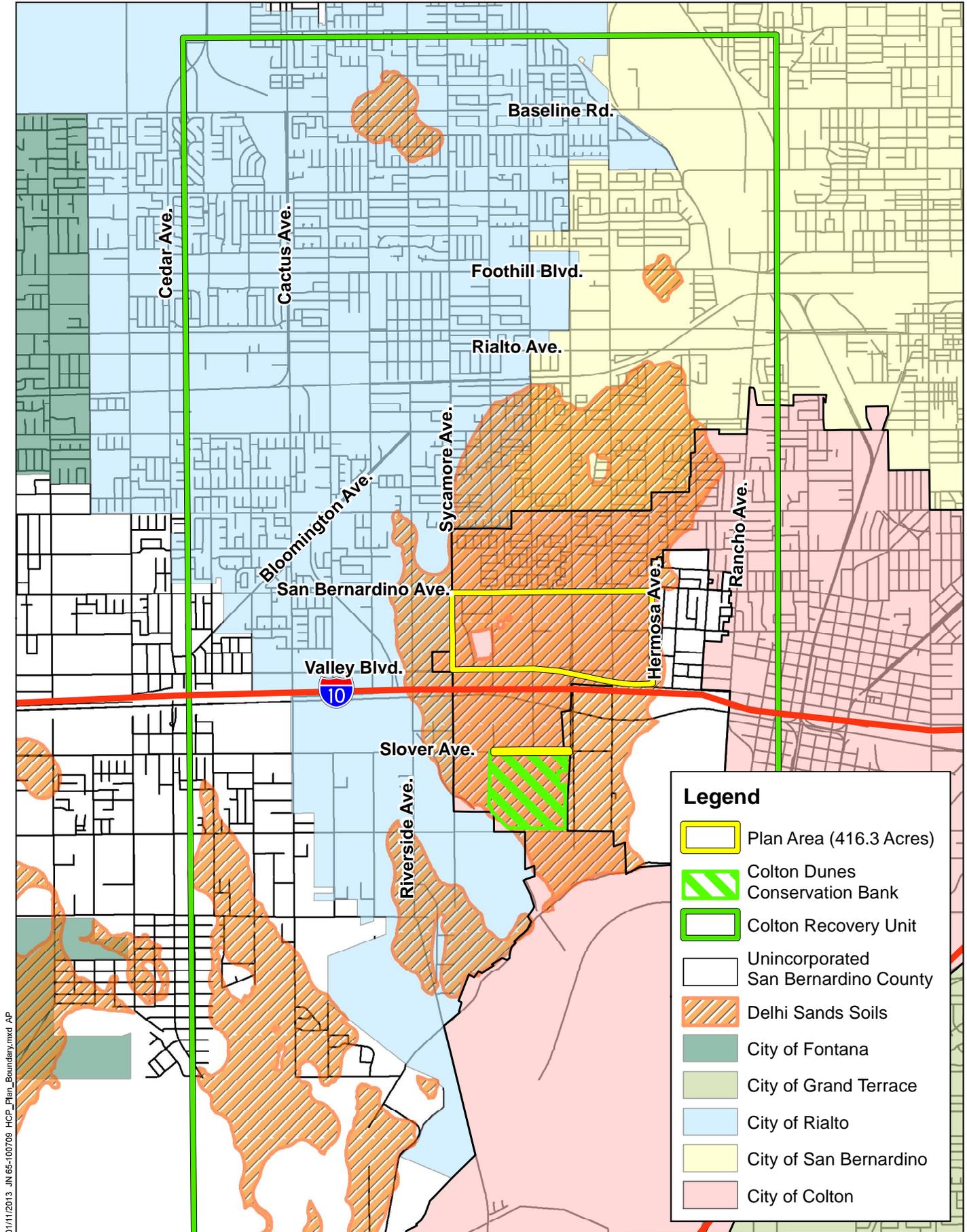
Exhibit 2 shows the location of Delhi sands within the Colton Recovery Unit, including the City of Colton and the West Valley HCP area. Generally, the proposed HCP is bounded on the south by I-10. To the north, the HCP boundary is San Bernardino Avenue, to the west by the Rialto City limits and to the east by Hermosa Avenue. The areas encompassed by this HCP include the proposed Specific Plan area, the Regional Arrowhead Medical Center (ARMC), the Hermosa Gardens Cemetery and under-developed land south of the cemetery between Meridian Avenue and Hermosa Avenue, as well as the existing Laing and ARMC Hospital Reserve Site DSF conservation areas. These areas are illustrated in Exhibit 3.

The Central Valley portion of San Bernardino County, in which the City of Colton is located, before the down turn of the economy, experienced unusually high growth rates. As more coastal areas, such as Orange County, approach build-out, the emphasis for residential, industrial, and commercial development has shifted to the east (e.g., Riverside and San Bernardino Counties). Even within these once thinly populated areas, there are now incorporated areas that are approaching capacity. For example, Rancho Cucamonga, a city of approximately 170,000 people that is located to the north and west of the I-15 Freeway was 90 percent built out by 2001 (Rancho Cucamonga General Plan, 2001). One of the primary areas of potential growth within the vicinity of the Inland Empire lies east of the I-15, west of the I-215, and north of the I-60 Freeways. In addition, the I-10 Freeway passes through the center of this large complex of freeway-accessible land.

The City of Colton represents a major development opportunity within this emerging market and still offers large areas of undeveloped/underdeveloped lands and commercial property north of the I-10 Freeway. The HCP area is the largest mass of undeveloped/underdeveloped land adjacent to the I-10 Freeway within this emerging market. As such, the City of Colton is looking to maximize the benefit to the local community as well as provide for the conservation of the DSF as part of that development activity.

A market study prepared in advance of the Specific Plan indicates that there will be demand for residential, retail commercial, office, business park/light industrial, and hospitality uses within the HCP area. Given the size of this development area, a combination of all these uses is contemplated. However, in order to plan for these uses, those areas considered important to the continuity of DSF in Colton north of the I-10 Freeway must be identified and incorporated into the planning process for the HCP area. Hence, approval of the proposed HCP and issuance of an incidental take permit will be part of the entitlement process for of the HCP area.

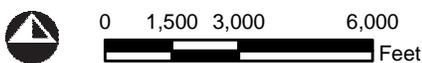
The City of Colton is a town with few development opportunities. The Specific Plan area is adjacent to the Arrowhead Regional Medical Center (ARMC) – San Bernardino County's Level 2 Trauma Center. ARMC has over 3,000 employees and accommodates over 325,000 annual visitors to the facility. Without the constraints of habitat, the area surrounding the ARMC would be a significant economic engine for the City of Colton and the region. Since development has not taken place, Colton's local economy has struggled and the community has been forced to impose a Utility User's Tax (UUT) to provide resources to fund essential services. This UUT expired in 2011, increasing the sense of urgency for a community with an already limited local economy.



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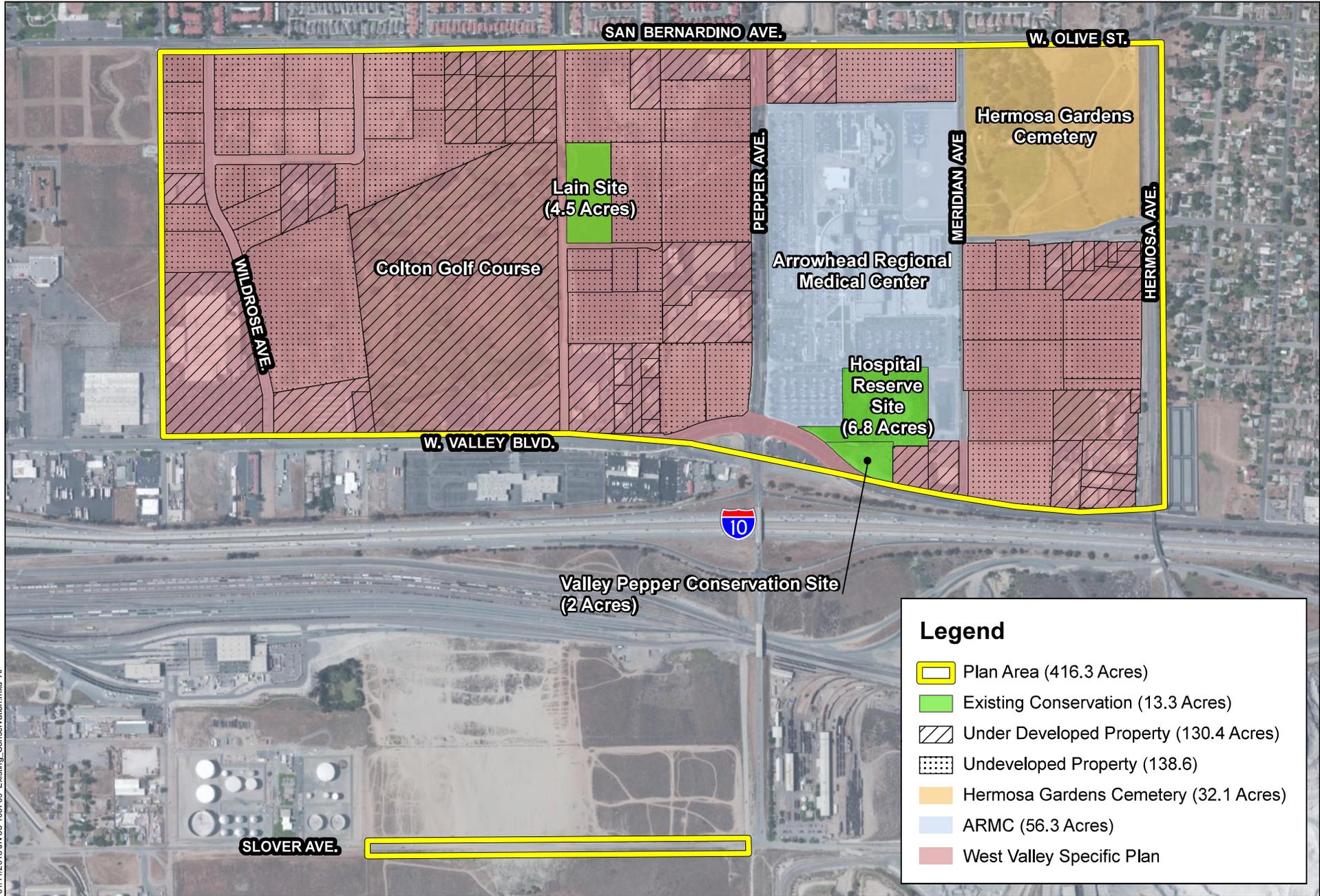
Legend

- Plan Area (416.3 Acres)
- Colton Dunes Conservation Bank
- Colton Recovery Unit
- Unincorporated San Bernardino County
- Delhi Sands Soils
- City of Fontana
- City of Grand Terrace
- City of Rialto
- City of San Bernardino
- City of Colton



Source: San Bernardino County GIS, US FWS

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Plan Area



01/11/2013 JN 65-100709 Existing_Conservation.mxd AP



Source: US Fish and Wildlife, EnviroPlus Consulting, MBA GIS, ESRI World Imagery

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Existing Land Use

The conservation areas identified in the HCP will allow the City of Colton to develop the remaining areas within the HCP area, providing an essential economic base to serve its growing population.

1.4 - Regulatory Requirements

1.4.1 - Federal Endangered Species Act

As recommended by USFWS, this section lays out the most relevant statutes of FESA that must be complied with for the issuance of this permit. Section 9 of the Endangered Species Act (Act) and federal regulations pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Individuals and State and local agencies proposing an action that is expected to result in the take of federally listed species are encouraged to apply for an incidental take permit under Section 10(a)(1)(B) of the Act to be in compliance with the law. Such permits are issued by the Service when take is not the intention of and is incidental to otherwise legal activities. An application for an incidental take permit must be accompanied by a habitat conservation plan, commonly referred to as an HCP. The regulatory standard under Section 10(a)(1)(B) of the Act is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under Section 10(a)(1)(B) of the Act, a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

Section 7 of the Act requires federal agencies including USFWS, to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. "Jeopardize the continued existence of..." pursuant to 50 CFR 402.2, means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. Issuance of an incidental take permit under Section 10(a)(1)(B) of the Act by the Service is a federal action subject to Section 7 of the Act. As a federal agency issuing a discretionary permit, the Service is required to conduct an internal consultation.

The Section 10(a)(1)(B) Process – HCP Requirements and Guidelines

The Section 10(a)(1)(B) process for obtaining an incidental take permit has three primary phases: 1) the HCP development phase; 2) the formal permit processing phase; and 3) the post-issuance phase.

During the HCP development phase, the project applicant prepares a plan that integrates the proposed project or activity with the protection of listed species. An HCP submitted in support of an incidental take permit application must include the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested;
- Measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances;
- Alternative actions considered that would not result in take; and
- Additional measures USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of: 1) a proposed HCP, 2) a draft Implementing Agreement (IA), if applicable, 3) a permit application, and 4) a \$100 fee from the applicant. The Service must also publish a Notice of Availability (NOA) of the proposed HCP and permit application in the Federal Register to allow for public comment. The Service also prepares an Intra-Service Section 7 Biological Opinion; and prepares a Set of Findings, which evaluates the Section 10(a)(1)(B) permit application in the context of permit issuance criteria (see below). A Section 10(a)(1)(B) incidental take permit is granted upon a determination by the Service that all requirements for permit issuance have been met. Statutory criteria for issuance of the permit specify that:

- The taking will be incidental;
- The impacts of incidental take will be minimized and mitigated to the maximum extent practicable;
- Adequate funding for the HCP and procedures to handle unforeseen circumstances will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- The applicant will provide additional measures that the Service requires as being necessary or appropriate; and
- The Service has received assurances, as may be required, that the HCP will be implemented.

During the post-issuance phase, the Permittee and other responsible entities implement the HCP, and the Service monitors the Permittee's compliance with the HCP as well as the long-term progress and success of the HCP.

When developing a Habitat Conservation Planning program, the USFWS requires the use of a five-point policy, which is included as an Addendum (65 FR 35242, June 1, 2000) to the Service's HCP Planning Handbook (1996) that focuses on the incorporation of five specific components. These five components include: (1) biological goals and objectives, (2) adaptive management, (3) monitoring, (4) permit duration, and (5) public participation. The purpose of this policy is to promote nationwide efficiency, effectiveness, and consistency within and between the USFWS, and to enhance the nationwide HCP program.

1.4.2 - Critical Habitat

The USFWS has not designated Critical Habitat for DSF.

1.4.3 - Recovery Plans

Section 4(f) of the ESA requires the development and implementation of recovery plans for all species listed as endangered or threatened unless it is determined that a plan will not further the recovery of the species. Recovery plans and associated recovery unit boundaries are separate from Critical Habitat. A recovery plan identifies and assigns priorities to actions required for the recovery of a species. The goal of recovery is to restore a listed species to the point where it is no longer endangered or threatened. However, Recovery Plans are advisory in nature and do not require any party or governmental entity to undertake specific tasks.

Areas known to be inhabited by the DSF or areas that contain suitable restorable habitat were grouped into three Recovery Units (RUs) by USFWS based on geographic proximity, similarity of habitat, and potential genetic exchange: the Colton, Jurupa, and Ontario RUs. The occupied and restorable habitat in the RUs includes only those areas that contain Delhi series soils. This Recovery Unit is bounded to the west by Cedar Avenue, to the east by Pennsylvania Avenue in San Bernardino County, extending along a

straight line to the west side of Interstate 215, to the north by Baseline Road, and to the south by the Santa Ana River.

A criterion of the DSF Recovery Plan (USFWS 1997) is that at least eight populations be permanently protected. The populations that inhabit the largest remaining block of Colton Dunes located east of Riverside Avenue, south of I-10, north of the Santa Ana River, and west of the cement plant, is called out as a priority for protection. Further, the recovery criteria state that at least four of the eight populations required for recovery should be located in the Colton RU, two of them north of I-10 (including the Hospital Reserve Site), and two south of the I-10 Freeway. Dispersal corridors will need to be maintained between the populations.

In addition to establishing/protecting eight populations of DSF, recovery actions were enumerated by USFWS in the DSF Recovery Plan. Some of the actions which may be relevant to the HCP include:

- Occupied and restorable habitat and dispersal corridors in the RUs should be mapped. (Mapping may be expedited by using Geographic Information System [GIS].)
- Ownership information should be compiled for occupied and restorable habitat areas and dispersal corridors within the RU.
- In general, habitat needed for breeding, feeding, and/or the development of early stages should be acquired in fee. Dispersal corridors may be protected through easements and voluntary management agreements. Mitigation banking is likely to be effective.
- Each management unit needs a site-specific plan to address habitat management needs and threats to the habitat or population. Habitat enhancement or restoration may figure prominently in management plans, particularly in areas where fly populations have been extirpated or reduced.
- Habitat enhancement within occupied or partially occupied sites involves conservation of sand sources and removal of non-native weeds such as tumbleweed, mustard, horehound, and grasses that invade the dune habitat. Following weed removal, some re-vegetation with native species may be required.

In addition to the 1997 Recovery Plan, the Service completed a 5-Year Review for the Delhi Sands Flower-loving fly (USFWS 2008). Contained within that document are the following recommendations:

- **Protection of Additional Delhi Sands flower-loving fly Habitat:** Additional habitat should be conserved to ensure protection of populations large enough to remain viable in the long term. Most existing conservation parcels are unlikely to support viable populations without additional surrounding habitat.
- **Management of Occupied Delhi Sands flower-loving fly Habitat:** Restoration and management are necessary in Delhi Sands flower-loving fly conservation areas to improve or maintain habitat quality. Additional research is needed to identify the most effective and efficient techniques to establish or maintain important Delhi Sands flower-loving fly habitat characteristics. Delhi Sands flower-loving flies are most commonly observed in sandy areas with sparse cover of native shrubs, and the goal of habitat restoration and management should be to establish and maintain this condition until more specific habitat requirements are determined.
- **Monitor Existing Populations:** Systematic monitoring of the Delhi Sands flower-loving fly throughout known and potentially occupied sites is necessary to track the recovery of the subspecies. Because Delhi Sands flower-loving flies are scarce and difficult to observe, it is difficult to estimate population distribution, abundance, or density. Systematic sampling efforts would provide the basic data to estimate occupancy and relative abundance through time;

- **Research Objectives Related to Delhi Sands flower-loving fly Biology:** The lack of definitive information regarding many aspects of Delhi Sands flower-loving fly biology limits the effectiveness of restoration and management within Delhi Sands flower-loving fly conservation areas. Information related to oviposition (egg-laying), larval biology, and adult dispersal could potentially improve efficiency of restoration and management; and
- **Revise Recovery Plan:** Several years of presence/absence survey data, combined with known changes in land use throughout historical Delhi Sands flower-loving fly habitat, provide information that can be used to generate more precise recovery strategies. Some locations that were previously considered valuable conservation areas should no longer be considered viable targets for conservation, which increases the importance of conserving lands that provide known long-term conservation value for the Delhi Sands flower-loving fly.

1.4.4 - National Environmental Policy Act

NEPA requires federal agencies to include in their decision-making process appropriate and careful consideration of all environmental effects of a proposed action and of possible alternatives. Documentation of the environmental impact analysis and efforts to avoid or minimize the adverse effects of proposed actions must be made available for public notice and review. This analysis is documented in either an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The federal action agency must disclose in these documents whether their proposed action, including issuing a permit to a non-federal project proponent, will adversely affect the human or natural environment.

Because the issuance by USFWS of an incidental take permit under Section 10 of the ESA constitutes a federal action, USFWS must comply with NEPA. To satisfy NEPA requirements, USFWS has prepared a draft EA that accompanies this draft HCP. The EA: 1) identifies the purpose and need for the Service's proposed action, i.e., issuance of a federal Section 10(a) Permit; 2) describes the environment that would be affected by the applicant's proposed project, including the effects of the Service's proposed authorization of incidental take; 3) discusses alternatives considered; 4) describes plans to mitigate impacts to DSF habitat; and 5) identifies possible environmental consequences of the proposed project and mitigation measures.

SECTION 2: COVERED ACTIVITIES

Covered activities mean certain activities carried out or approved by Permittee on Covered Lands that may result in incidental take of Covered Species. Covered Activities means the following activities related to development of the site, provided that these activities are otherwise lawful:

1. New commercial, residential, industrial, and agricultural and/or horticultural development within 79.4 acres of “Developable Land” as defined in Section 4 below and as illustrated in Exhibit 5.
2. Redevelopment programs and projects within 248.2 acres of “Developed Land” as defined in Section 4.
3. Construction, operation and maintenance of public or public use facilities/structures within “Developed and Developable Lands” including:
 - a) Public roadways to their ultimate width as identified in the City’s General Plan;
 - b) Improvements identified in adopted Transportation Improvement Programs;
 - c) Public utility infrastructure;
 - d) Trails and public access facilities;
 - e) Other public facilities and projects identified in the City’s General Plan and/or Capital Improvements Plans.
4. Closure and rehabilitation of a 5.8 acre area encompassing a section of East Slover Avenue west of Pepper Avenue.
5. Construction, operation and maintenance within the Conservation Areas as defined in Section 5 below and as illustrated in Exhibit 5, of the following activities:
 - a) Trails;
 - b) Passive Recreation, limited to non-consumptive uses such as wildlife observation, walking on designated trails; and
 - c) Management of designated Conservation Areas, Natural open spaces, or sensitive habitats.
6. Emergency, Safety and Police Services. Local, state and federal law enforcement entities will be allowed access to the Covered Lands and the Conservation Areas as necessary to enforce the law. Medical, rescue, firefighting operations¹, and other emergency service providers will be allowed access to the Covered Lands and the Conservation Areas to carry out operations necessary for the health, safety and welfare of the public.

¹ Impacts of wildfire to DSF habitat are considered a Changed Circumstance and they are addressed under that section.

SECTION 3: ENVIRONMENTAL SETTING AND BIOLOGICAL RESOURCES

3.1 - Introduction

This section presents the physical and biological setting of the Plan area upon which the Impact Analysis (Section 4) and the Conservation Strategy (Section 5) are based. This section also includes a discussion of how the baseline conditions were used to determine the suitability of the various open areas of Delhi Sand soils for supporting DSF.

3.2 - Physical Features

3.2.1 - Existing Land Uses

Land uses in the area include the Arrowhead Regional Medical Center (56.3 acres), the Hermosa Gardens Cemetery (32.1 acres), existing conservation (13.3 acres) and under-developed properties (130.4), interspersed with 138.6 acres of undeveloped land (See Exhibit 3).

3.2.2 - Topography

Elevations range from 1,000 to 1,100 feet. The terrain is mostly flat with evidence of dune formation and no evident drainage pattern.

3.2.3 - Soils

While this entire area historically was covered with Delhi sands soils, the above listed land uses have resulted in the removal / degradation of a significant portion of the Delhi sands soils. Only 148.5 acres of intact Delhi sands soils remain within the HCP boundaries.

3.3 - Biological Resources

3.3.1 - Natural Communities

Vegetation throughout most of the site is a mixture of native vegetation and ruderal vegetation. Native vegetation consisted of remnant plants from the Colton dune plant community once predominant in the area including California buckwheat (*Erigonum fasciculatum*), telegraph weed (*Heterotheca grandiflora*), and California croton (*Croton californicus*). Ruderal vegetation is mostly non-native grasses, including ripgut grass (*Bromus diandrus*), Mediterranean grass (*Schismus* sp.), and wild oat (*Avena* sp.). Other non-native components included tumbleweed (*Amaranthus albus*), mustard (*Brassica* sp.), shortpod mustard (*Hirschfeldia incana*), redstern filaree (*Erodium cicutarium*), and puncture vine (*Tribulus terrestris*).

3.3.2 - Wildlife Species

Due to the moderate to high level of disturbance throughout the Plan area, many of the floral and faunal species are those that are typically found in urban or agricultural areas. Birds within the Plan area are those typically associated with urbanized areas. Common avian species observed include California towhee (*Pipilo californica*), lesser goldfinch (*Carduelis psaltria*), song sparrow (*Melospiza melodia*), and house finch (*Capodacus mexicanus*). Raptors include red-tailed hawks (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and burrowing owls (*Athene cunicularia*). Mammalian species are thought to be limited to those that have adapted to or can coexist with humans, such as pocket gophers (*Thomomys bottae*), California ground squirrel (*Citellus beecheyii*), desert cottontails (*Sylvilagus auduboni*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), and opossum (*Didelphis virginiana*).

3.3.3 - Sensitive Biological Resources

Sensitive biological resources are plant communities, habitats or individual species that have special recognition by the Federal or State government, or conservation organizations as endangered, threatened,

rare or otherwise sensitive. The California Department of Fish and Game (CDFG), USFWS, and conservation groups like the California Native Plant Society (CNPS) maintain watch lists of such resources. The primary focus of this HCP is the management of Delhi sands habitats within the Plan area, including areas suitable for DSF. Table 1 provides a list of sensitive wildlife species from the California Natural Diversity Database (2012) that potentially could occur within the Delhi sands habitats within the HCP area and its vicinity, and the potential for their occurrence. The paragraphs below provide brief descriptions of the species that are present in the HCP area, or that have a reasonable potential to occur there.

Table 1: Sensitive Wildlife Species Potentially Occurring in the City

Species		Common Name	Status		Potential for Occurrence
Scientific Name			USFWS	CDFG	
<i>Rhaphiomidas terminatus abdominalis</i>		Delhi sands flower-loving fly	FE	None	Present
<i>Dipodomys merriami parvus</i>		San Bernardino Kangaroo Rat	FE	None	Low
<i>Polioptila californica californica</i>		Coastal California gnatcatcher	FT	SSC	Low
<i>Aimophila ruficeps canescens</i>		Southern California rufous-crowned sparrow	FSC	SSC	Low
<i>Perognathus longimenbris brevinasus</i>		Los Angeles pocket mouse	FSC	SSC	Low
<i>Chaetodipus fallax fallax</i>		Northwestern San Diego pocket mouse	FSC	SSC	Low
<i>Athene cucicularia</i>		Burrowing owl	None	SSC	Moderate
<i>Phrynosoma coronatum blainvillei</i>		San Diego Horned Lizard	None	SSC	Moderate
<i>Cnemidophorus hyperythrus</i>		Orange-throated whiptail	None	SSC	Low
<i>Amphispiza belli belli</i>		Bell's sage sparrow	None	SSC	Low
<i>Lanius ludovicianus</i>		Logger-headed shrike	FSC	SSC	Moderate
<i>Aquila chrysaetos</i>		Golden Eagle	None	SSC	Low
<i>Accipiter cooperi</i>		Cooper's Hawk	None	SSC	Low
Potential for Occurrence:					
Low = Low potential for occurrence - No recent or historical records exist of the species occurring in the City or its immediate vicinity (within approximately 5 miles) and the diagnostic habitat requirements strongly associated with the species do not occur in the City or its immediate vicinity.					
Moderate = Moderate potential for occurrence - Either a historical record exists of the species in the City or its immediate vicinity or the some of the diagnostic habitat requirements associated with the species occur in the City or its immediate vicinity.					
High = High potential for occurrence - Both a historical record exists of the species in the City or its immediate vicinity and the diagnostic habitat requirements strongly associated with the species that occur in the City or its immediate vicinity.					
<u>U.S. Fish and Wildlife Service</u>			<u>California Department of Fish and Game</u>		
FE	Federal Endangered		SE	State Endangered	
FT	Federal Threatened		ST	State Threatened	
PE	Proposed Endangered		SSC	State Species of Special Concern	
PT	Proposed Threatened				
FC	Federal Candidate				
FSC	Species of Concern				

Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) FE. The DSF is endemic to the Colton Dunes (Delhi sands series soils) in areas that contain suitable conditions for the subterranean early stages, adult nectar sources, and adult feeding, breeding, and perching areas. Soil and climatic conditions, and other ecological and physical factors contribute to the maintenance of open sand areas

within the species' range. Urban development, agricultural conversion, sand mining, invasion by exotic plant species, off-highway vehicle use and dumping trash have caused loss and modification of the majority of this species' habitat. The former range of the species (coinciding with the Delhi sands soils formation) has been divided into three RUs: Ontario, Jurupa, and Colton. The Plan area is within the Colton Recovery Unit.

Burrowing Owl (*Athene cunicularia*) SSC. The burrowing owl is a small crepuscular owl that utilizes existing burrow complexes built by other animals, such as ground squirrels (*Otospermophilus beechyii*). Burrowing owls were once very abundant in California but have seen a steady decline over the past one hundred years, especially in the last 20 years. Burrowing owls commonly nest in roadside banks and agricultural areas. Burrowing owls are protected by CDFG as a species of special concern, as well as by the federal Migratory Bird Treaty Act. Fallow fields in the Plan area provide suitable foraging and nesting habitat for this species. Conservation of suitable DSF habitat would also provide conservation opportunities for the burrowing owl.

San Diego Horned Lizard (*Phrynosoma coronatum blainvillii*) FSC, SSC. This species occurs in grassland, sage scrub, and chaparral habitats. It is found in open sandy areas such as ridge tops and washes, especially where harvester ants (*Pogonomyrmex* spp.) are found. This species has often been observed within fallow fields in the general area of the Plan. Conservation of suitable DSF habitat would also provide conservation opportunities for the San Diego horned lizard.

Loggerhead Shrike (*Lanius ludovicianus*) SSC. Loggerhead shrikes are found in a variety of habitats. Throughout their range, their habitat typically includes grasslands interspersed with scattered trees and shrubs that provide nesting and perching sites. A variety of habitats also supply breeding territories, including cultivated cropland, transportation rights-of-ways, and shelterbelts. Shrikes typically hunt from dead trees, tall shrubs, utility wires and fences, and may impale their prey on sharp twigs, thorns, or barbed wire. Conservation of suitable DSF habitat would also provide conservation opportunities for the loggerhead shrike.

3.3.4 - Covered Species

The DSF is the only federally listed species known to occur within the project area. The DSF was federally listed as endangered on September 23, 1993 (58FR 19881). The DSF belongs to the Dipteran family Mydidae. These flies are relatively large, with size among the species ranging from approximately 1.5 to 4 centimeters. All species of *Rhaphiomidas* are associated with arid, sandy habitats, with most species living on dune systems of inland desert valleys, rivers, deltas, and beach strands.

The life history of the Delhi Sands flower-loving fly is largely unknown. Oviposition (egg-laying) occurs within loose, sandy soils in late summer months and may primarily occur near telegraph weed (Rogers and Mattoni 1993; Kingsley 1996). Larval stages develop completely underground and emerge as adults from July through September. At the time of listing, the Delhi Sands flower-loving fly flight season was thought to be restricted to August and September, and the larval food source for the Delhi Sands flower-loving fly was unknown. We now know that the flight period begins as early as July 1 based on several observations of adult Delhi Sands flower-loving fly in July (USFWS 2004). Adults are most active during the warmest, sunniest parts of the day, and both males and females extract nectar from California buckwheat and other plants (Kingsley 1996). It is not clear if nectar feeding is essential for adult survival or reproduction.

Adult DSF flight period is typically July through September, when individual adults emerge, reproduce and die. The adult life span of an individual DSF is thought to last for a few weeks at most (Kingsley 2002). DSF, like other *Rhaphiomidas* species, appears to have an annual life cycle (because of the annual flight). However, it is widely believed that the underground larval/pupal stage may persist for additional years, depending upon various environmental factors such as annual rainfall, food availability and

weather conditions during the flight season. It is known that DSF larvae develop underground; however, the specific biology (larval biology, habits and food requirements) is not yet known for the DSF.

The DSF is only known to occur in association with Delhi sand deposits and presumably occupied the once extensive dune system of the upper Santa Ana River Valley, including portions of what is now the City of Colton, west through portions of the City of Ontario, and south to the Santa Ana River. Today, DSF exist on only a few disjunct sites within a radius of about 8 miles in southwestern San Bernardino and northwestern Riverside counties (USFWS 1997). More than 95 percent of known DSF habitat was considered eliminated by development, agriculture and other land management practices by 1993. Many of the last remaining fragments of DSF habitat are currently under pressure by land management efforts such as heavy disking, irrigation, manure dumping, and gravel dumping.

Habitat loss was identified as a major threat to the Delhi Sands flower-loving fly at the time of its listing in 1993. While we have identified additional lands occupied by Delhi Sands flower-loving fly (see Spatial Distribution and Habitat Conditions section above), urban development has rapidly progressed within the range of the Delhi Sands flower-loving fly since the listing of the subspecies. Occupied sites have become increasingly isolated by surrounding development. Of the remaining open space land, most has been impacted to some degree by current or historical agricultural practices.

Habitat degradation of occupied sites was also identified as a major threat to the Delhi Sands flower-loving fly at the time of its listing. The primary habitat degrading activity identified in the final rule was soil disturbance resulting from grading, plowing, disking to remove vegetation for fire control, and off-highway vehicle use. Illegal dumping of automobiles and other trash was also known to degrade Delhi Sands flower-loving fly habitat. These activities continue today despite the listed status of the subspecies (USFWS 2008)

In 2005, the 150 acre Colton Dunes Conservation Bank was established by Vulcan Materials, Incorporated. The Conservation Bank will provide long-term protection and management of Delhi Sands flower-loving fly-occupied habitat upon sale of its conservation credits (“Colton Dunes Habitat Enhancement and Management” Biological Opinion; FWS-SB-3849.1). The Conservation Bank is within the largest remaining block of occupied Delhi Sands flower-loving fly habitat that includes the plan area (See Exhibit 3), and protection of this habitat is key to maintaining the Delhi Sands flower-loving fly in this important Recovery Unit.

Most of the existing Delhi Sands flower-loving fly conservation sites, including the Hospital Reserve site and the Laing site, are likely too small and fragmented to sustain Delhi Sands flower-loving fly populations through time. Additional lands will need to be acquired to ensure long-term conservation of Delhi Sands flower-loving flies at the existing protected sites (USFWS 2008).

USFWS has been successful working with local jurisdictions and private landowners to address Delhi Sands flower-loving fly issues through individual HCPs. Between 1995 and 2007, they issued 7 Section 10(a)(1)(B) incidental take permits for HCPs covering the Delhi Sands flower-loving fly. (Geary Hund, USFWS, Fish and Wildlife Biologist, 2012, Personal Communication).

While some efforts have been made to conserve occupied Delhi Sands flower-loving fly habitat within the HCP area, these may not be of sufficient size to sustain a stable population through time north of the I-10 freeway. Meanwhile, the Colton Dunes Conservation Bank will be effectively managed to protect a relatively large block of Delhi Sands flower-loving fly habitat south of the I-10 freeway once all of the conservation credits are sold. USFWS is also seeking additional lands surrounding the Conservation Bank to ensure the long-term conservation of large block of Delhi Sands flower-loving fly habitat south of the I-10 freeway. The conservation proposed in this HCP will add 50.3 acres² of DSF habitat to the existing conservation north of the I-10 Freeway resulting in 63.6 acres of DSF conservation within the HCP area.

² A total of 50.4 acres will be set aside but up to 0.1 acre in the Conservation Area may be developed as a trail.

This includes 0.4 acres of stepping stone habitat islands (a minimum of 3) spaced across a 0.8 acre linear park to provide connectivity for DSF between the two large blocks of conservation areas west of Pepper Avenue, along San Bernardino Avenue. The non-conserved portion of the linear park will feature a habitat linkage walkway that will be 3 to 4 feet wide with 3 inches of decomposed granite. The walkway will include interpretative signs on DSF and the Colton Dunes habitat.

Quality of DSF Habitat

In determining DSF habitat quality, clean, aeolian deposited Delhi soils are the key component. These soils occur in various habitats including coastal sage scrub, disturbed non-native grasslands, and landscaped/ornamental areas (Ken Osborne, 2007, personal communication). Throughout the Plan area, the quality of DSF habitat varies from unsuitable to high quality. However, habitat quality continues to degrade due to the impacts of illegal dumping, off-highway vehicles, non-native vegetation invasion, and the lack of management to maintain a perpetual sand supply.

Conversely, soils and sands deposited by fluvial processes from the surrounding alluvial fans do not support DSF. These alluvial soils are composed of coarse sands, cobble, and gravel, as exemplified by the Tujunga soil series. In this part of San Bernardino County, the normal separation of these two soil types, Delhi sands and Tujunga soils, has been lost as a result of past agricultural practices (i.e., the disking of fields has mixed the Tujunga soils found along the edge of the sand dunes with the clean Delhi sands found within the dunes). Depending on the extent of mixing and contamination, some areas formerly mapped as Delhi sands no longer have potential to support DSF populations.

Quality of Delhi soils on vacant parcels in the HCP area was originally rated for its potential to support DSF. Each vacant parcel or open area was visually inspected and rated based on a scale of 1 to 5, with 5 being the best quality and most suitable habitat in the biologist's judgment:

1. Soils dominated by heavy deposits of alluvial material including coarse sands and gravels with little or no Delhi sands and evidence of soil compaction. *Unsuitable*.
2. Delhi sands are present but the soil characteristics include a predominance of alluvial materials (Tujunga Soils). *Very Low Quality*.
3. Although not clean, sufficient Delhi sands are present to prevent soil compaction. Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality*.
4. Abundant clean Delhi sands with little or no alluvial material or Tujunga soils present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. *Moderate Quality*
5. Sand dune habitat with clean Delhi sands. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. *High Quality*

Subsequently, the above ratings (1 thru 5 as defines above) were converted to high, medium, low and unsuitable habitat as shown in italics at the end of each numbered rating (see Exhibit 4 below).

SECTION 4: IMPACT ASSESSMENT AND LEVEL OF TAKE

This section serves to quantify incidental take levels anticipated to occur based on the maximum acres of habitat disturbance authorized by this Plan. This is necessary to assess the direct, indirect and cumulative impacts of the HCP on DSF, as required by 16 U.S.C. 1539(a)(2)(A)(i) and implementing regulations.

Direct Impacts

This section contains a summary of incidental take levels of DSF habitat primarily through the direct loss of habitat within the HCP. In general, these take levels are estimated losses of varying qualities of suitable DSF habitat as jointly identified by Tom McGill, representing the City of Colton, and USFWS, based on the methodology discussed in Section 3 above. The Service has determined that high, moderate, and low habitat suitability are either occupied by DSF, as determined by protocol surveys, or likely are occupied based on proximity to known occupied sites.

The HCP area north of the I-10 Freeway is 416.3 acres, of which 148.5 acres contain potentially suitable DSF habitat, all of which are found within the Colton RU. Exhibit 4 shows the quality and location of DSF habitat within the HCP area. With the implementation of this proposed Plan and issuance of the requested incidental take permit; authorized development could occur on 79.4 acres of low, moderate, and high quality DSF habitat north of the I-10 freeway; defined here as Developable Lands. Another 248.2 acres of land north of the I-10 freeway has already been developed; defined here as Developed Lands. A portion of the Developed Lands would be redeveloped and changed to other uses.

A total of 50.3 acres of habitat within the HCP area that are mostly high and moderate quality DSF habitat would be conserved; defined here as new Conservation Areas. The 50.3 acres consists of three large blocks of occupied habitat and 0.4 acres of habitat islands connecting two of them. The habitat islands, minimum three, would be distributed evenly across a 0.8-acre linear park. The non-conserved portion of the linear park would feature a walkway that will be 3 to 4 feet wide with 3 inches of decomposed granite. The walkway will include interpretative signs on DSF and the Colton Dunes.

Up to seven hundred feet of up to six foot wide floating boardwalk trail may be constructed within one of the conservation areas. The boardwalk would permanently impact up to 0.1 acre of DSF habitat and maintenance of the trail would result in up to 0.02 acres of temporary impacts every 5 years, totaling 0.1 acres over the 30 year life of the permit. The City of Colton would work with the land manager (RLC) and the USFWS to determine the final location of the trail. Signage would be placed at the beginning of the boardwalk and at any stopping points, i.e., a widened area with a bench, telling users that the area contains sensitive habitat and they must stay on the trail. Access to the trail would be controlled by a gate. If the land manager determined that damage to the conservation area is resulting from unauthorized use originating from the trail, they would inform the City and the City would close the trail to all but guided use until a plan is developed to address the unauthorized use. This may include additional signage and increased patrols of the area.

The conservation areas encompass the majority of the known occupied DSF habitat in the HCP area. Without this Plan, these 50.3 acres of high and moderate quality occupied DSF habitat might otherwise be degraded or lost but, instead will be combined with existing conservation areas, creating a large block of 63.6 acres of preserved DSF habitat north of the I-10 Freeway. Exhibit 5 shows the location of existing and proposed Conservation areas within the plan area. In addition, the City will abandon its easement over a portion of East Slover Avenue, a 5.8-acre area, and close it to traffic. The closure will contribute to the conservation of DSF by reducing illegal off-highway vehicle use, dumping and other forms of trespass on adjacent DSF habitat (See Exhibit 5).

Under this HCP, City of Colton proposes to entitle 79.4 acres of primarily low quality DSF habitat for development within the HCP boundaries. Development within the HCP area would be subject to restrictions of this HCP, including restoration of conserved habitat, offsite mitigation, and/or proposed mitigation fee that will be imposed on developers. Future development of open land with Delhi sands

would destroy all DSF eggs, larvae and pupae within that property; however, it is anticipated that few, if any, adults would be lost due to the low density of DSF and the ability of adult DSF to escape direct impacts.

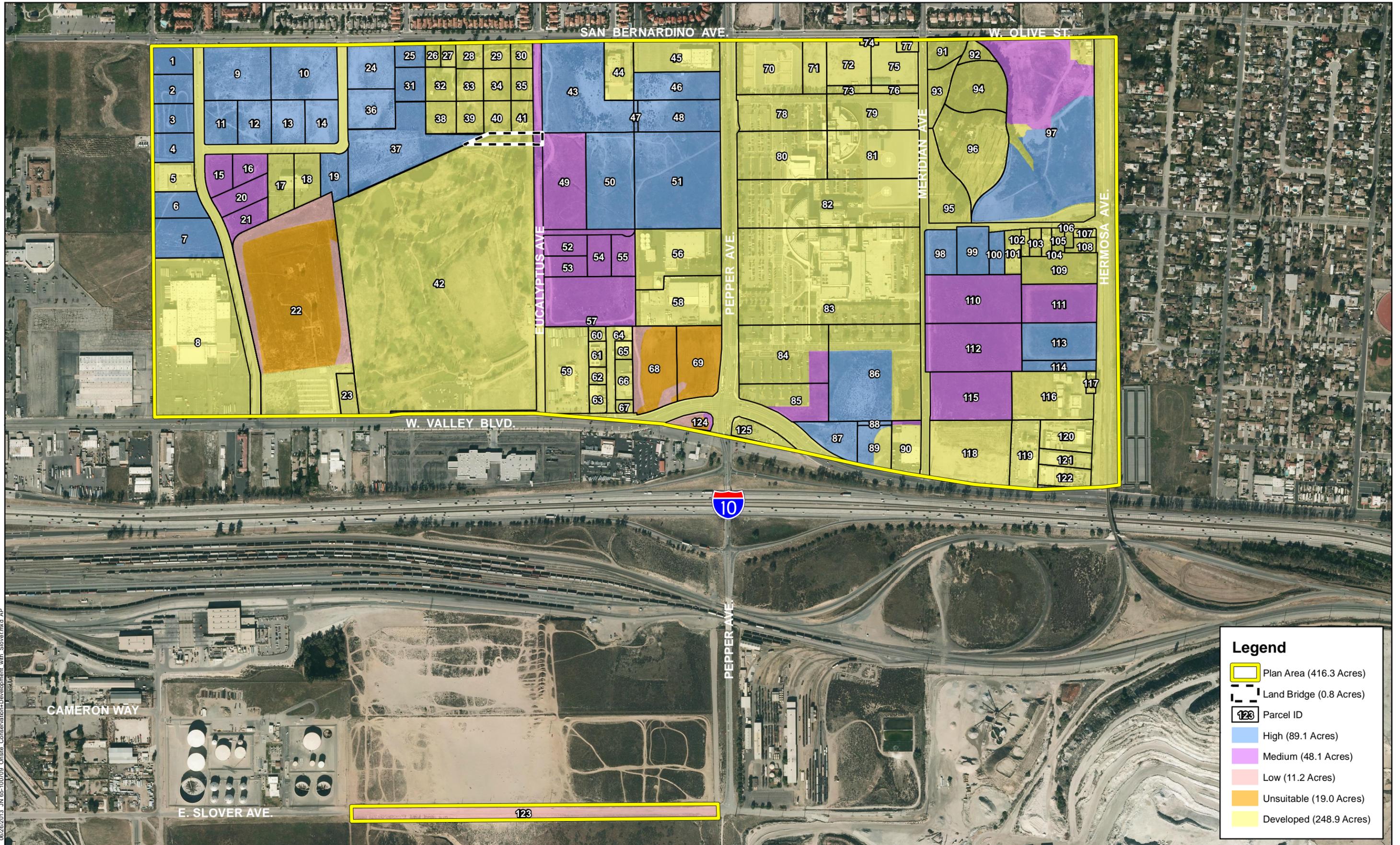
It is anticipated that initial cleanup and restoration of conservation areas and future management activities will result in disturbance to small amounts of DSF habitat, estimated to be 0.5 acre and that ongoing restoration, management and monitoring activities after that will result in 0.1 acre of disturbance every 5 years, totaling 0.5 acres over the 30 year life of the permit.

Site management activities will be focused on vegetation management, trash removal. Trail maintenance will involve periodic repairs to the boardwalk. While these activities are unlikely to affect DSF if appropriate minimization measures are implemented, minor ground disturbance may injure or kill a small number of eggs, larvae, and/or pupae.

The closure of Slover Avenue, while providing long-term benefits to conservation activities south of the I-10 Freeway could result in temporary disturbance to small amounts of DSF habitat during the closure process, estimated to be no more than 0.05 acre. Potential impacts could occur from the removal of trash along the route and the placement of gates and/or other barriers to control access to the abandoned dirt road. All closure and construction activities will be completed between June 1 and September to avoid the DSF flight/breeding season and the month prior to the emergence of adults from the ground when emerging animals may be near the ground surface.

Although the various conservation areas will be fenced to control unauthorized access, authorized access by emergency vehicles, principally police, medical, and fire, could result in temporary disturbance to small amounts of DSF habitat. It is estimated to be no more than 0.05 acre every 3 years, for a total of 0.5 acre over the life of the permit. It is expected that the minor disturbance associated with emergency entrance into one of the conservation areas may injure or kill a small number of adults, eggs, larvae, and/or pupae.

In total temporary impacts from establishing and maintaining conservation areas including the closure of Slover Avenue, trail construction and maintenance, as well as accommodating the occasional need for law enforcement and other emergency response activities are estimated to result in 1.65 acres over the life of the permit (See Table 2b).

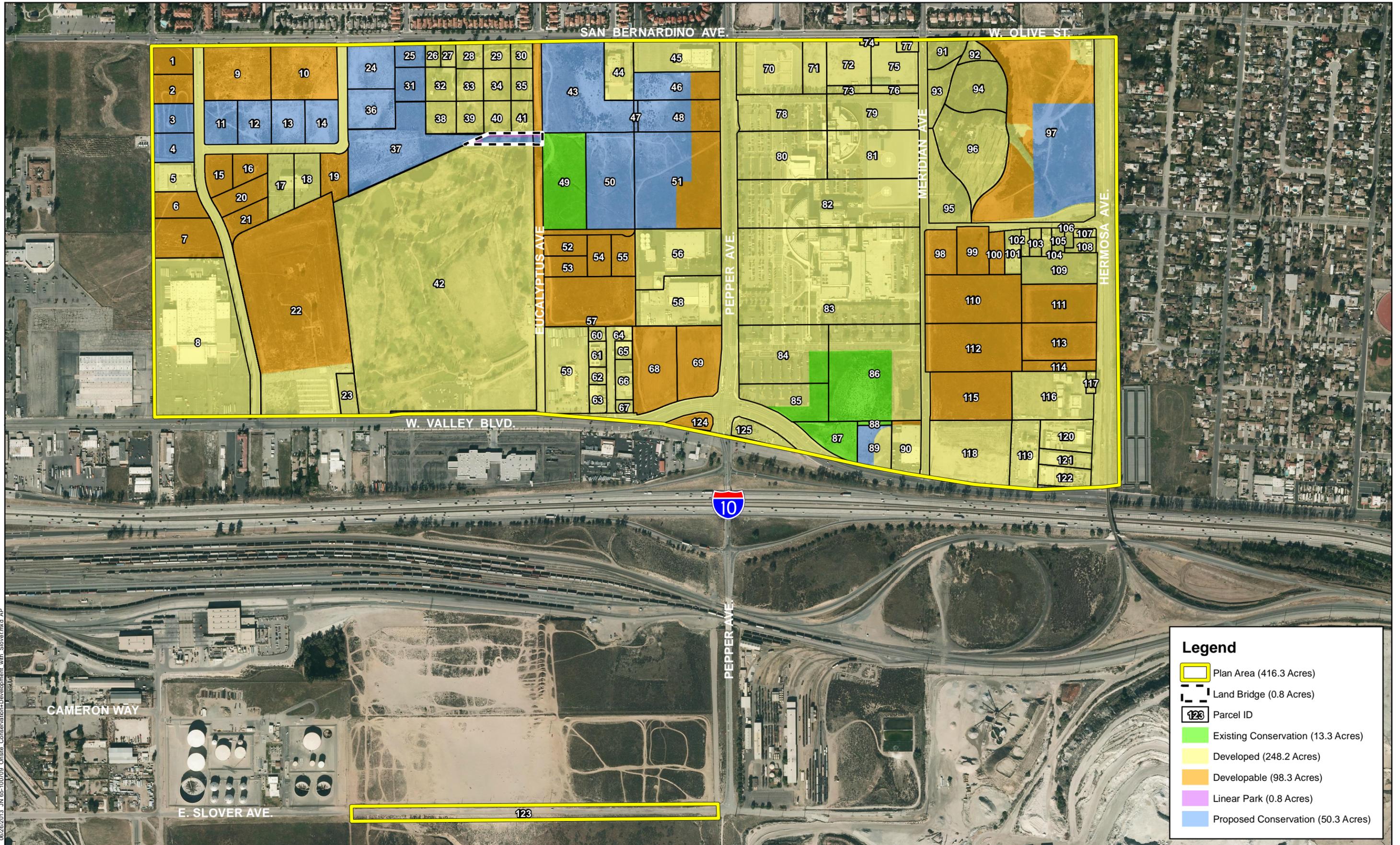


06/26/2013 JN 05-100709 Onsite Conservation-Development with Sliver.mxd AP



Source: US Fish and Wildlife, EnviroPlus Consulting, Eagle Aerial - 2012

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Habitat Quality



Legend

- Plan Area (416.3 Acres)
- Land Bridge (0.8 Acres)
- 123 Parcel ID
- Existing Conservation (13.3 Acres)
- Developed (248.2 Acres)
- Developable (98.3 Acres)
- Linear Park (0.8 Acres)
- Proposed Conservation (50.3 Acres)

06/26/2013 JN 05-100709 Onsite Conservation-Development with Sliver.mxd AP



Source: US Fish and Wildlife, EnviroPlus Consulting, Eagle Aerial - 2012

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Onsite Conservation and Development

Table 2a - Permanent Habitat Impacts and Conservation

Location	Total Acreage	Developed Acreage	Acreage of Unsuitable Habitat	Acreage of DSF Habitat				Acreage of Permanent Impacts to DSF Habitat				Acres Proposed for Permanent Conservation of DSF Habitat ³			
				Habitat Quality				Habitat Quality				Habitat Quality			
				High	Medium	Low	Total	High	Medium	Low	Total	High	Medium	Low	Total
West of Pepper Ave	214.8	106.8	19.0	63.8	18.7	5.4	87.8	21.9	14.2	5.4	41.4	42.1	0.0	0.0	42.1
Arrowhead Regional Medical Center	79.6	70.1	0.0	7.5	2.1	0.0	9.6	0.0	0.1	0.0	0.1	0.8	0.0	0.0	0.8
Hermosa Gardens Cemetery	33.1	16.0	0.0	9.9	7.3	0.0	17.1	3.5	6.6	0.0	10.1	6.4	0.6	0.0	7.0
Remaining Habitat between Meridian and Hermosa Ave	46.1	20.9	0.0	7.8	17.4	0.0	25.2	7.4	17.4	0.0	25.2	0.0	0.0	0.0	0.0
Slover Avenue	5.8	0.0	0.0	0.0	0.0	5.8	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Habitat Islands in Linear Park	0.4	0	0	0.2	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.4
Existing Paved and Dirt Roads	36.9	34.2	0.0	0.0	2.6	0.0	2.7	0.0	2.6	0.0	2.6	0.0	0.0	0.0	0.0
Total:	416.3	248.2	19.0	89.1	48.0	11.4	148.5	33.1	40.9	5.4	79.4	49.4	0.6	0.0	50.3

The proposed onsite conservation areas encompass the majority of the known, occupied habitat within the HCP area which is not already conserved

Table 2b – Temporary Impacts

Project	Acreage	Total Acreage
Initial restoration and cleanup of Conservation Areas	0.50	0.50
Maintenance of Conservation Areas	0.1 acres every 5 years	0.50
Closure of Slover Avenue	0.05	0.05
Emergency Repairs and Law Enforcement Activities	0.05 acres every 3 years	0.50
Trail Construction and Maintenance	0.02 acres every 5 years	0.10
Total:		1.65

SECTION 5: CONSERVATION STRATEGY

5.1 - Summary of Conservation Strategy

This section presents the conservation strategy proposed by the City of Colton to support development of land within the HCP area. The conservation strategy is designed to create a fully functioning conservation area of sufficient size and complexity to sustain a DSF population north of the I-10 Freeway in the City of Colton. The Plan includes a description of the biological goals and objectives, general measures to avoid or minimize impacts to DSF, species-specific measures to avoid or minimize impacts, habitat preservation measures to mitigate unavoidable impacts, monitoring and reporting requirements, and funding assurances. The conservation strategy when implemented will achieve the biological goals and objectives for this plan.

5.2 - Biological Goals and Objectives

5.2.1 - Biological Goals

The conservation strategy for the HCP area recognizes that the Plan area is one of the few remaining viable DSF habitat areas north of the I-10 freeway, as emphasized by USFWS's 5-Year Review of the DSF (March 2008). The protection of sufficient high quality DSF habitat within the Plan area is needed to ensure the long-term survivability of DSF populations north of the I-10 freeway. To accomplish this level of protection, the City of Colton and USFWS developed the following goals:

- Preserve large blocks of DSF habitat north of the I-10 Freeway so that there is adequate open space, a perpetual sand supply and high quality habitat for DSF and associated Delhi Sands plant community species;
- Protect important DSF populations north of the I-10 Freeway in the Colton Recovery Unit;
- Provide a connection between important populations north of the I-10 Freeway;
- Provide long-term conservation management of DSF populations in Colton north of the I-10 Freeway;
- Reduce threats to DSF habitat along East Slover Avenue between Riverside Avenue and Pepper Avenue; and
- Develop an education program for the citizens of the City of Colton about the Delhi Sands natural community, DSF and the ongoing efforts to protect it, and a discussion of why the species was listed and what can be done to reduce impacts to the species.

5.2.2 - Biological Objectives

The above goals are supported by the following biological objectives:

- Those areas identified as providing moderate, high quality, DSF habitat and that have been designated for long-term conservation will be mapped as DSF conservation areas within the HCP area. No development will be allowed within these designated conservation areas;
- Implement a per acre mitigation fee for all development areas within the HCP boundaries with DSF habitat;

- With these monies, fund the purchase and long-term management of a large conservation area within the City of Colton, north of the I-10 Freeway that contain high-quality sand dune habitat for the DSF;
- Proactively manage the proposed conservation area for the preservation and recovery of DSF populations in north Colton; and
- Minimize impacts to DSF and their habitat by imposing development standards, including avoidance and minimization measures.

5.3 - General Measures to Avoid/Minimize Impacts

The following avoidance and minimization measures must be implemented during construction of Covered Activities in the HCP area.

5.3.1 - Construction Monitoring

Covered Project Proponents will retain an experienced DSF biologist, e.g., someone who has conducted field research and/or presence/absence surveys, to function as Biological Monitor. At least 30 days prior to initiating project activities, project proponents will submit to the City, in writing, the name(s), any permit numbers, and resumes of all prospective Biological Monitors. Project activities, will not begin until a Biological Monitor(s) has been approved by the City. At least one week prior to grading, City-approved monitor(s) shall provide the City's Development Services Department with written and photographic documentation that the limits of construction have been properly defined, i.e., marked and fenced, are readily identifiable and are not encroaching on the existing or proposed conservation areas that will be established by this HCP. The Biological Monitor(s) shall be responsible for ensuring that the approved limits of grading are not exceeded, that the fencing delineating the limits of construction is maintained, and that the contractor adheres to the other provisions set forth in this Section. The Biological Monitor will visit the site at least a twice weekly during project construction. The monitor(s), in cooperation with the on-site construction manager(s), shall have the authority to halt construction activities in the event that these provisions are not met. The monitor(s) shall submit a report to the City's Development Services Department at the end of the month during each month of construction documenting the implementation of all grading and construction minimization measures. If construction results in encroachment on existing or proposed conservation areas, the City will report the encroachment to the USFWS within 24 hours after receiving the monthly report.

The City of Colton will retain a qualified Biological Monitor for any repair, operations or maintenance, or emergency activities resulting in disturbance to occupied or potentially suitable DSF habitat. Biological Monitors for these activities will be subject to the same experience, approval and reporting requirements as for construction.

5.3.2 - Worker Environmental Awareness Program

All contractors and city employees who may work in areas containing occupied or potential DSF habitat will attend a worker environmental awareness program (WEAP) conducted by a biological monitor familiar with the species, to ensure that they are informed of the sensitivity of conserved areas and all applicable avoidance and minimization requirements to ensure conformity with all applicable provisions of Section 5.3. The Biological Monitor will present information on the life history, ecology, legal and conservation status of the DSF and potential penalties that could occur as a result of violations of the endangered species Act. The importance and significance of the associated HCP and incidental take permit to the City of Colton will be emphasized. Personnel will be required to sign and date a form

indicating that they have attended the program and fully understand the conservation measures and agree to comply.

5.3.3 - Control of Toxic Substances

During and after the construction of any Covered Project, the proper use and disposal of oil, gasoline, diesel fuel, antifreeze, and other toxic substances shall be restricted so as to avoid impacts to DSF and their habitat.

5.3.4 - Fire Prevention

Equipment to extinguish small brush fires (e.g., from trucks or vehicles) shall be present on site during all phases of construction, along with personnel trained in the use of such equipment. Smoking shall be prohibited in construction areas adjacent to flammable vegetation.

5.3.5 - Controlled Access

Prior to commencement of clearing or grading activities, areas of existing conservation and areas proposed for conservation shall be clearly marked by a Biological Monitor, and temporary fencing will be installed to prevent disturbance by construction vehicles. All movement of construction personnel, including ingress and egress of equipment and personnel shall be limited to designated construction zones. The temporary fencing will be removed upon completion of all construction activities and replaced with permanent fencing to protect conserved habitat. The Covered Project Proponent and its contractor(s)/subcontractor(s) shall be responsible for compensating at a ratio of 5:1 (acre offsite conservation/acre impact) from the Colton Dunes Conservation Bank or through a private purchase of suitable DSF habitat and a commitment to its long-term management for the disturbance of sensitive habitat outside of the approved limits of construction. Any restoration mandated for infringements outside the project footprint shall require a restoration plan approved by the City.

5.3.6 - Storage and Staging Areas

No temporary storage or stockpiling of construction materials shall be allowed within conserved areas/habitat, and all staging areas for equipment and materials shall be located a minimum of 50 feet away from existing or proposed conserved habitat. Staging areas and construction sites shall be kept free of trash, refuse, and other waste; no waste dirt, rubble or trash shall be deposited within conserved habitat.

5.3.7 - Dust Control

Active construction areas shall be watered regularly to control dust, and to minimize impacts to nearby habitats, especially sensitive species habitat adjacent to construction areas. If at any time, significant amounts of dust or material are determined by the monitoring biologist to be affecting conserved habitat, then corrective measures must be taken immediately.

5.3.8 - Lighting

Night lighting shall be prohibited during the course of construction, unless absolutely necessary for safety and protection of property. If necessary, the lights must be shielded to minimize impacts to the surrounding habitat.

5.4 - Species-Specific Measures to Avoid/Minimize Impacts

5.4.1 - Habitat Assessment

The City of Colton and USFWS have already spent considerable time and money inventorying the suitability of DSF habitat within the Specific Plan boundaries. This information provided the basis for the Incidental Take analysis, as well as the proposed conservation measures. The following additional avoidance and mitigation measures are proposed:

- The City of Colton will fence all conservation areas to limit access. Educational signage will be posted with information regarding the Colton Dunes natural community and DSF.
- Permanent lighting in developed areas adjacent to DSF conservation areas/habitat will be shielded to minimize impacts to DSF and other wildlife.
- Project applicants will be given a map clearly delineating DSF existing or proposed conservation areas in proximity to their project site.
- Project applicants will be responsible for clearly defining their project boundaries, i.e., marking and fencing, and designating the ingress and egress routes and demonstrating to the City of Colton that no impacts will occur to existing or proposed DSF conservation areas.
- All incidences of damage to DSF habitat not approved for development under the HCP will be reported within 24 hours to USFWS for their evaluation and recommendations for compensation, including the following:
 - Any damage or loss of 0.25 acre or more of DSF habitat within existing or proposed conservation areas by the applicant or construction crews or contractors working for the applicant will be mitigated in the Colton Dunes Conservation Bank at a 5:1 ratio with the minimum compensation being 1-acre⁴.
 - Additionally, all damaged DSF habitat will be fully restored at the applicant's expense. A restoration plan will be developed for the review and approval of the City of Colton and the Service. It will include the following measures:
 - Berms or excavations created by equipment will be removed restoring the natural contour of the site. To the extent possible, displaced topsoil and native vegetation (even if crushed) will be placed back in the area of the disturbance.
 - Native seed will be collected from the surrounding area and seeded into the site after the top soil and grubbed vegetation is placed on the site of the disturbance.
 - Weeds will be hand pulled or treated with an approved herbicide for two years in the growing season following the restoration.

⁴ The minimum mitigation unit available in the conservation bank is one credit, which equals one acre. The acreage of required mitigation will be rounded up to the next whole number, e.g., 1.5 acres would be rounded up to 2 acres.

- Performance standards will be developed for the restoration and the site will be monitored by a biologist for a specified period to determine if they have been met.
- Remediation actions will be specified in the restoration plan and taken in the event the performance standards are not met within the specified period.

5.5 - Measures to Mitigate Unavoidable Impacts

Currently, there are 13.3 acres of established conservation lands north of the I-10 Freeway within the City of Colton. Another 150 acres of DSF habitat has been earmarked for conservation through the establishment of the Colton Dunes Conservation Bank located in the City of Colton south of the I-10 Freeway. Table 3 presents the present conservation areas north of the I-10 Freeway. The Conservation Strategy in this HCP will build upon the established conservation area associated with the Hospital Reserve site, the Laing conservation site, and the Valley/Pepper conservation site, by conserving an additional 50.3 acres of high and moderate quality DSF habitat.

Table 3: Established DSF Conservation Areas within the City of Colton

Colton Conservation Areas	Acres
ARMC Hospital Reserve Site	6.8
“Laing” Site	4.5
Valley/Pepper Conservation Site	2.0
Total	13.3

Table 4 below provides the number of acres of developable DSF Habitat as well as the acres of moderate and high-quality of DSF habitat that would be conserved by the City within a consolidated conservation area being proposed by this Plan. Exhibit 5 shows the existing and proposed conservation areas within the HCP boundaries that together will conserve a large block of 63.6 acres of mostly high quality DSF habitat.

5.5.1 - Permanent Onsite Conservation

The City of Colton proposes to add an additional a 50.3 acres of moderate and high quality DSF habitat to the existing conservation areas located within the HCP boundaries, resulting in the conservation of a total of 63.6-acres of DSF habitat in the Plan area. The 50.3 acres of onsite conservation include:

1. Two large areas of high quality occupied DSF habitat totaling 42.1 acres along San Bernardino Avenue between Pepper and Riverside Avenues, including the site known as King-is-Coming adjacent to the existing Laing conservation area;
2. A 0.8 acre habitat linkage or land bridge consisting of 0.4 acres of stepping stones of habitat, between the two large areas of occupied habitat;
3. The addition of 0.8 acres to the existing ARMC Hospital Reserve/Valley Pepper Site ; and
4. The conservation of 7.0 acres of medium and high quality DSF habitat at the Hermosa Garden Cemetery.

5. The conservation of habitat between Pepper and Riverside Avenues will also preserve and maintain a habitat linkage to the existing Reichel Conservation Area in Rialto. Adding to the existing conservation areas will increase the prospects for long-term preservation of DSF in the Plan area and the Colton Recovery Unit, including by maintaining the potential for genetic exchange between conservation areas.

5.5.2 - Off-site Conservation

5.5.2.1 Closure of E. Slover Avenue

The City of Colton will close a portion of East Slover Avenue south of the I-10 Freeway and east of Riverside Avenue, totaling 5.8 acres. While this area will not be permanently conserved as part of this HCP, the closure of this section of East Slover Avenue is expected to reduce a number of ongoing threats to DSF and its habitat in this area including illegal off-road vehicle use and dumping. Its closure will also facilitate movement of Delhi sands from a large sand dune north of East Slover Avenue to the Colton Dunes Conservation Bank to the south. The conservation bank was established to conserve DSF.

5.5.3 - Monitoring and Management

The City of Colton is committed to the permanent protection and management of both the existing and proposed conservation areas in the Plan area. To achieve this maintenance, management and restoration of new conservation areas will be provided by the Riverside Land Conservancy (RLC)⁵ either separately or in concert with their management responsibilities for Colton Dune Conservation Bank, as defined below. In addition, the following restoration/enhancement efforts will be initiated at the proposed conservation site and fully documented in a Habitat Management Plan (HMP). The HMP will address the following elements:

1. A complete biological inventory will be conducted to establish baseline conditions, including focused surveys for DSF by a qualified biologist.
2. Focused surveys for other sensitive species potentially occurring within the conservation area will be conducted during the first year, if determined appropriate by item 1 above.
3. Access to conservation areas will be restricted through the use of fences, walls and/or other appropriate barriers, immediately upon acquisition of the site. This will minimize potentially harmful activities such as illegal dumping, shooting, and off-road vehicle use.
4. Access into the conservation site will be through locked gates.
5. Signs will be posted along the site's perimeter indicating that the site is closed to public access in order to protect sensitive habitats. These signs will also be educational and informative to assist the public in understanding the importance of protecting this site, its native habitat, and the ongoing restoration efforts for DSF.
6. All trash will be removed from the site.
7. A weed removal and control program will be developed specific to the conservation site, utilizing data gathered during item 1 above.
8. All disturbed areas within the conservation site will be re-vegetated in accordance with the HMP.

⁵ The RLC currently manages the onsite Laing Conservation Area, the adjacent Reichel Conservation Area and the Colton Dunes Conservation Bank south of I-10.

9. Development of a set of habitat disturbance control measures that will ensure that all approved temporary disturbances to the habitat within the site will be minimized and subsequently restored after the activity has been completed.
10. No permanent disturbances will be allowed within the conservation site.
11. A qualified biologist will monitor the above activities to ensure compliance with the HCP and HMP.
12. The HMP will include a set of performance criteria to determine the success of all proposed restoration and enhancement efforts as well as consistency with the programs defined in the HMP.
13. Additional focused surveys will be conducted for DSF and other potentially occurring species by a qualified biologist at year 3 and every 3 years thereafter.
14. Excess sand which accumulates at the downwind side of conservation areas will be collected within the plan area and distributed at upwind side of the conservation areas as directed by RLC's land manager. The land manager will direct the distribution of the sand, e.g., width and depth, to maximize its contribution to the maintenance of ecological processes and minimize temporary impacts to DSF under the direction. RLC's land manager will consult with the USFWS in determining the best location and configuration of salvaged sand during the first three applications. Different configurations may be used to determine the method with the greatest efficacy, for purposes of adaptive management.
15. An implementation report will be prepared and submitted to USFWS at the end of the first year.
16. Annual reports will be submitted to USFWS every year following the first year through year five. Reports will be prepared and submitted to USFWS every 3 years thereafter.

5.5.4 - Conservation Easements

The City of Colton shall maintain fee title interest in the conservation properties it acquires and all responsibility of property ownership. It will record a conservation easement over them with the San Bernardino Recorder's Office, assuring both conservation in perpetuity and access rights to the conservation property by both the RLC and USFWS. The conservation easement will be granted to the RLC who shall maintain responsibility for ensuring the habitat and conservation value of the property.

5.5.5 - Rough Step Process

The City of Colton recognizes that it is required to ensure that progress towards assembling the 63.6-acre conservation area stays ahead of the total impacts allowed under the permit. To ensure that this occurs, the City will acquire land, place a conservation easement over it and fund all management and monitoring during the first five years and will include the management and monitoring costs in the City's annual budget process before grading permits are issued by the City to private developers or City Departments allowing ground disturbing activities to occur. Land will be acquired according to the following jump-start guideline and stay-ahead provision.

Jump-Start Guideline. The City of Colton will either acquire the King-is-Coming site, 20.8 acres of occupied DSF habitat adjacent to the existing 4.5 acre Laing conservation site, or 19.3 acres of occupied DSF habitat west of the land bridge and adjacent to the Hermosa Cemetery as illustrated in Exhibit 6. Development within the HCP area will focus on the lower quality DSF habitat areas with the exception of high quality DSF habitat identified for development in the HCP adjacent to the King-is-Coming site and bordering Pepper Avenue. Those areas will be allowed to develop immediately upon issuance of the

incidental take permit for the HCP, signature of the implementing agreement, and acquisition and recording of a conservation easement on the first 20 acres of DSF habitat, as defined above.

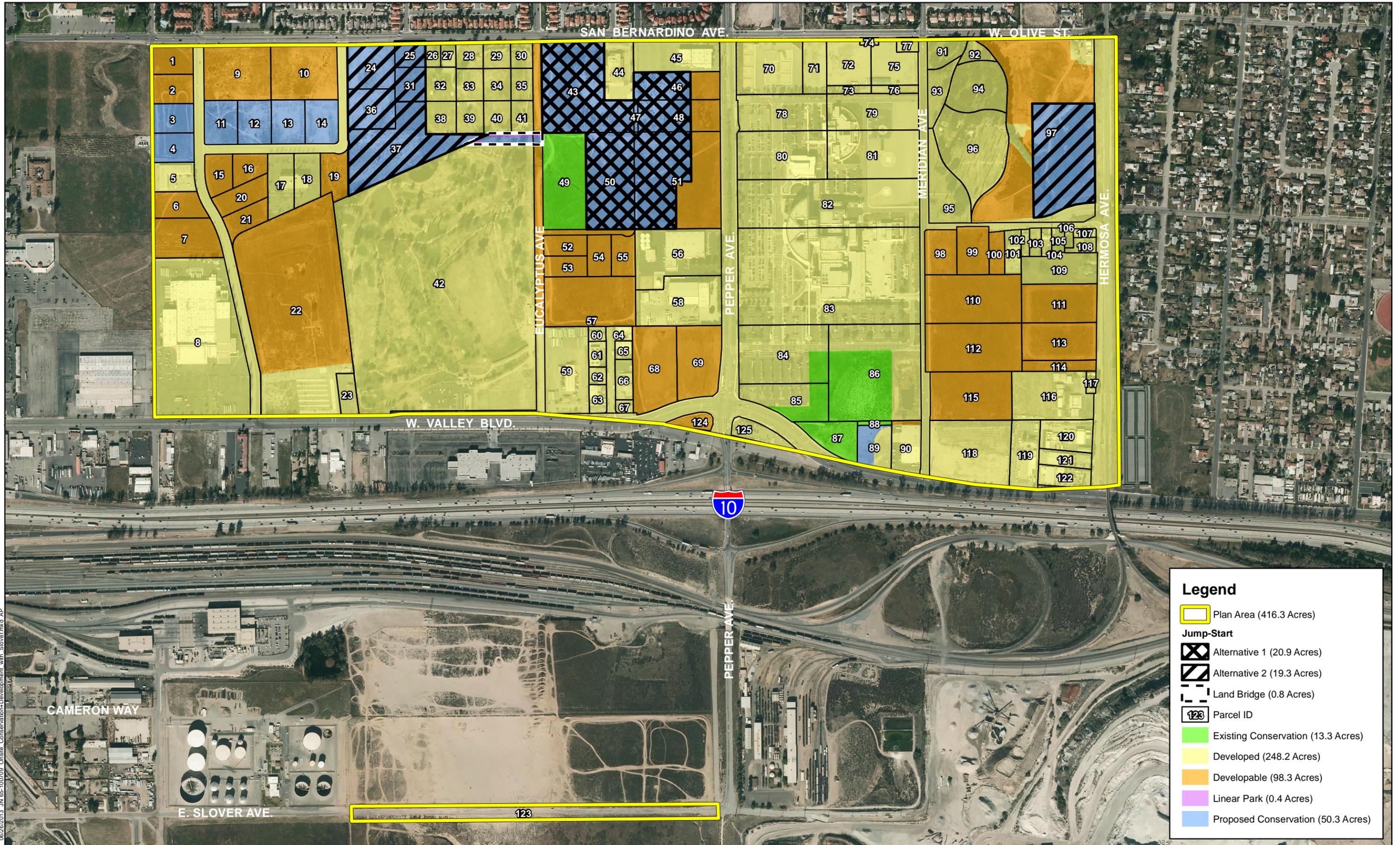
Stay-Ahead Provision. During the first year after permit issuance, the City of Colton will be establishing its HCP management structure, collecting initial HCP fees, and actively pursuing land acquisition deals beyond the original commitment as part of the Jump-Start requirement. To allow the City time for these start-up tasks to occur, the Stay-Ahead Provision will only apply after 1 year of Plan implementation. After 1 year, the City of Colton will need to demonstrate that its compliance with the Stay-Ahead Provision by the following methodology:

The amount of DSF habitat acquired for conservation will exceed by 5 % the amount of DSF habitat allowed to be developed. Table 4, provides a listing of all parcels identified for development, current site conditions (developed vs. undeveloped), the type and acres of DSF habitat remaining on undeveloped portions of the parcel and conservation value of the identified DSF habitat. The amount of DSF habitat conserved and acquired will both be measured by number of acres of the habitat conserved or permitted for development multiplied by the following ratios based on quality of the habitat:

High Quality Habitat	1.15
Medium Quality Habitat	1.00
Low Quality Habitat	0.25

Thus, development or conservation of five acres of high quality DSF habitat will be recorded as 5.75 conservation debits or 5.75 conservation credits, respectively. The total accumulation of credits must exceed total debits at all times by at least 5 %.

The City of Colton is in negotiations with the Riverside Land Conservancy (RLC) to provide management of the land immediately upon permit issuance.



Legend

- Plan Area (416.3 Acres)
- Jump-Start**
- Alternative 1 (20.9 Acres)
- Alternative 2 (19.3 Acres)
- Land Bridge (0.8 Acres)
- 123 Parcel ID
- Existing Conservation (13.3 Acres)
- Developed (248.2 Acres)
- Developable (98.3 Acres)
- Linear Park (0.4 Acres)
- Proposed Conservation (50.3 Acres)

06/26/2013 JN 05-100709 Onsite Conservation-Development with Silver.mxd AP



Source: US Fish and Wildlife, EnviroPlus Consulting, Eagle Aerial - 2012

HCP FOR DELHI SANDS FLOWER-LOVING FLY
Jump-Start Alternatives

Table 4: Acres of Developable DSF Habitat and Required Conservation

Parcel	Habitat Quality					Conservation		
	High	Moderate	Low	Unsuitable	Total	Ratio	Debits	Credits
1	1.3				1.3	1.15	1.50	
2	1.3				1.3	1.15	1.50	
3	1.3				1.3	1.15		1.50
4	1.3				1.3	1.15		1.50
6	1.4				1.4	1.15	1.61	
7	2.8				2.8	1.15	3.22	
9	4				4	1.15	4.6	
10	4				4	1.15	4.6	
11	1.6				1.6	1.15		1.84
12	1.6				1.6	1.15		1.84
13	1.6				1.6	1.15		1.84
14	1.6				1.6	1.15		1.84
15		1.1			1.1	1.00	1.1	
16		1			1	1.00	1.1	
19	1.3				1.3	1.15	1.50	
20		1.3			1.3	1.00	1.3	
21		1.1			1.1	1.00	1.1	
22				16.4	16.4	0.00	0.00	
24	2.3				2.3	1.15		2.65
25	.9				.9	1.15		1.04
31	1.1				1.1	1.15		1.27
36	2				2	1.15		2.3
37	6				6	1.15		6.9
43	7.2				7.2	2.0		14.4
46	1.7				1.7	2.0		3.4
46	0.9				0.9	1.5	1.04	
47	.1				.1	2.0		.2
48	1.8				1.8	2.0	2.07	3.6
48	1.0				1.0	1.15	1.15	
50	5				5	2.0		10
51	5.1				5.1	2.0		10.2
51	3.8				3.8	1.15	4.37	
52		1			1	1.00	1	
53		1			1	1.00	1	
54		1.1			1.1	1.00	1.1	
55		1.1			1.1	1.00	1.1	
57		4.9			4.9	1.00	4.9	
68				3.9	3.9	0.00	0.00	
69				3.3	3.3	0.00	0.00	
89	.7				.7	1.15		.81
97	6.5	0.3			6.8	1.15/1.00		7.78
97	4.1	7.0			11.1	1.15/1.00	11.72	
98	1.6				1.6	1.15	1.84	
99	1.7				1.7	1.15	1.96	
100	.7				.7	1.15	.81	
110		5			5	1.00	5	
111			3.1		3.1	0.25	0.78	
112		5			5	1.00	5	
113			3		3	0.25	.75	
114			.9		.9	0.25	0.23	
115		4.2			4.2	1.00	4.2	
118				5.5	5.5	0.00	0.00	
123	5.8				5.8	1.15		6.67
124		0.1	0.3	0.2	.6	1.00/0.25	0.18	
Total	85	35.2	7.3	23.9	151.4		73.33	81.58

*Conservation credits for high quality DSF habitat calculated using a 2.00 ratio.

The accounting of conservation credits against conservation debits under the Stay-Ahead provision will be reported annually by the City of Colton to USFWS and must demonstrate that the process is in rough step with the HCP. The process will be considered to be in rough step if conservation credits exceed conservation debits by 10 %. If the process is not in rough step at the time of the annual report, the City of Colton must meet and confer with USFWS to develop a mutually agreeable plan of action within 30 days. The plan of action may include:

- Minor Changes to the manner in which the Plan is being implemented;
- Making it a requirement that project proponents provide land in lieu of fees, subject to Service approval of proposed in-lieu parcel(s); and
- Suspending or revoking the permit.

Implementing Ordinance. During the first year after permit issuance, the City of Colton will adopt an implementing ordinance that will establish a DSF mitigation fee for local applicants seeking coverage under the Plan. The implementing ordinance will include a Property Action Analysis (PAR) and a Fee Nexus study documenting all required actions assembling and managing the City obligation to conserve and manage 50.3 acres of moderate and high quality DSF habitat. Costs will include the acquisition of lands in fees or through conservation easements, acquisition of conservation credits from the Colton Dunes Conservation Bank, and all short and long-term management actions needed for the onsite management of the assembled conservation properties as defined in the HMP (see Section 5.5.2 above).

5.6 Monitoring and Reports

5.6.1 - Adaptive Management Program

The framework for adaptive management programs can be found in Section 3.B.3.g of the Habitat Conservation Planning and Incidental Take Permit Processing Handbook (USFWS 1996) and in the final Five-Point Policy Guidance added to the Handbook in 2000. Adaptive management provides a method for examining alternative strategies for managing measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned. The incorporation of monitoring into the adaptive management program will provide new and additional data that can be incorporated into the risk assessment and management activities for DSF.

The overarching biological goal of the HCP is to provide additional conservation for DSF through the establishment and maintenance of new conservation areas with the focus on conserving and managing an additional 50.3 acres of occupied DSF habitat conservation north of the I-10 Freeway, together with existing conservation in the HCP area, creating, a 63.6 acre complex of conserved DSF habitat. This Adaptive Management Program will provide a flexible approach where conservation measures can be adjusted as part of an iterative process of monitoring the status of a species or its habitat and responding to the changed conditions (i.e., “learning by doing”).

Adaptive management programs, by nature, involve changing or modifying management activities when reduction/degradation is noted in a species or its habitat or potential threats are identified. Biological monitoring is thus an integral part of effective adaptive management programs and will provide USFWS, the City of Colton and/or the Riverside Land Conservancy with the information they need to determine if agreed-upon management activities are providing needed conservation for DSF or if modified procedures need to be implemented. USFWS, the City of Colton and/or the Riverside Land Conservancy, through biological monitoring as described in its management program provided in the HCP, will provide adaptive management for DSF.

5.6.2 - Biological Monitoring

Biological Monitoring is a mandatory element of all HCP's under the Five-Point Policy. As such, an HCP must provide for monitoring programs to gauge the effectiveness of the plan in meeting the biological goals and objectives, and to verify that the terms and conditions of the plan are being properly implemented. Biological surveying and monitoring is needed to establish baseline conditions for the proposed conservation area and to provide data that will help USFWS, the City of Colton and/or the Riverside Land Conservancy to assess compliance with the management plan as well as the Plan's effectiveness at meeting biological goals and objectives and help achieve or maintain healthy population(s) of DSF during the life of the permit. Monitoring will provide information on performance of management actions and scientific information to identify future management actions. Monitoring will also evaluate performance of the HCP in meeting overall biological goals and objectives. Data from biological monitoring will provide a framework upon which detailed and specific corrective actions and future monitoring activities can be developed and implemented to address biological questions arising regarding the ecological health of the habitat and dependent DSF population(s).

This monitoring program was designed 1) to evaluate the effectiveness of the HCP actions in improving and perpetuating DSF populations within the HCP area; and 2) to identify changes to the HCP program that may be needed. An analysis of the effectiveness of the habitat enhancement measures will be conducted throughout HCP implementation, in consultation with the USFWS. The DSF monitoring program has been designed to:

- Determine DSF presence/absence, trends in numbers detected, and habitat conditions⁶
- Identify relationships that may exist between habitat conditions and populations status.

The effectiveness of the conservation measures will be evaluated against the performance criteria. Results will be evaluated as part of the adaptive management process.

One of the overall goals of this HCP is to enhance, restore and create habitat for DSF to ensure that self-sustaining populations are maintained. Performance criteria provide a bench mark for measuring compliance with and effectiveness and approved habitat conservation plans.

5.6.3 - Annual Work Plan

Each year USFWS, the City of Colton and/or the Riverside Land Conservancy, will prepare and adopt an annual work plan that specifies management for the proposed 50.4 acre Conservation Area, and other conservation activities for the ensuing year.

Activities will include:

1. Fencing, other barriers, and security patrols to control the access of people, vehicles, livestock (including horses), and domestic pets;
2. Assessments, surveys, and monitoring of habitat and/or species;
3. Weed abatement and monitoring and removal of invasive plant species, particularly non-native grasses, mustards, Russian thistle, and wild radish; and
4. Thinning of native vegetation to maintain prescribed ratios of vegetation to open ground/dune areas;
5. Habitat restoration and enhancement of disturbed areas.

⁶ No method currently exists to determine the population size of DSF in a given area. If a method is developed, it will be incorporated into the monitoring program.

5.6.4 - Conservation Easement Compliance Monitoring

The Purpose of the Conservation Easement is to ensure the property will be preserved in a “natural condition” in perpetuity and to prevent any use of the property that will materially impair or interfere with the conservation values of the property. To achieve this purpose, semi-annual Compliance Monitoring visits to the site will be made with the express purpose of ensuring compliance with the conditions of the conservation easement. Activities of the site visits will include: traversing the site on foot making note of site conditions and taking photographs; visiting previously established photo points at property corners, along property lines, and a vantage points to look for changed conditions and document. Riverside Land Conservancy (RLC) is the anticipated Easement Holder and will conduct the monitoring. Conservation Easement Compliance Monitoring may be conducted concurrently with habitat assessments and other site visits. Annual reports will be prepared documenting the methods and result of the monitoring. Copies of the report will be submitted to the City and the USFWS. Copies will be provided to other parties upon request.

In the event that violations or other conflicts with the conservation conditions are observed, RLC will coordinate with the City to resolve the issues.

5.6.5 - Management of Endowment Funds

This HCP requires the funding of an Endowment to provide funds for stewardship and compliance activities. This Endowment Fund may be pooled with other funds for investment purposes but must be tracked and accounted for separately.

Management of endowment funds and disbursements of earnings shall be made in accordance with SB 1094, UPMIFA (Uniform Prudent Management of institutional Funds Act) and all other pertinent State and Federal law. RLC is the anticipated Endowment Holder. RLC will manage the Endowment Funds consistent with RLC policy and all applicable State and Federal laws. The Endowment Fund will be managed in such a way as to preserve the corpus and grow the earnings.

RLC will undergo an annual audit by an independent auditor who is, at a minimum, a certified public accountant. The Colton HCP Endowment Fund will be included in that annual audit. Internally, RLC will prepare an annual report of earnings and expenditures of the Colton HCP Endowment Fund. The report will include: beginning balance; contributions to fund; investment earnings and unrealized gain or loss; distribution amounts; administrative fees; ending balance; asset allocation of investment funds. Copies of the RLC audit and annual earnings and expenditures of the Colton HCP Endowment Fund will be available annually upon request.

5.7 Funding and Assurance for Plan Implementation

Funding for the acquisition and long-term management of the conservation areas will be provided by the City of Colton. This will be accomplished by the following mechanisms:

- The City will establish a development fee program by ordinance to finance the purchase and management of the habitat not currently controlled by the City as mitigation for loss of DSF habitat.
- The City will establish and contribute to a management endowment during the 30 year permit period as needed to ensure a perpetual revenue source will be available to manage and monitor the onsite conservation areas..

5.7.1 - Funding

This section specifies the funding that will be made available to adequately implement the HCP; including funding for land acquisition as well as the monitoring in the HCP area and management of habitat set aside onsite to offset impacts resulting from the taking of DSF. A development fee will be adopted that will address both land acquisition and an ongoing monitoring and management program in order to achieve the full conservation effort. The funding mechanism must also be established to ensure that enough funding will be received to create an Endowment Fund that will continue the monitoring and management program after the 30 year planning horizon.

The City of Colton will provide or cause to be provided, funding and/or funding mechanism as set forth in this section of the HCP. The City of Colton's obligations for funding this HCP are limited to the commitments described in this section and will include:

- Conservation of adequate habitat in an unfragmented manner for the effective preservation of DSF habitat north of the I-10 Freeway in the City of Colton; and
- Implementation of a HCP that will reasonably mitigate the impacts on DSF and the Colton Dunes plant community from Covered Activities within the HCP boundaries.

The City of Colton is also seeking the following assurances from USFWS:

- Carry out its responsibilities under FESA in a manner that strives to ensure that the City of Colton does not bear a disproportionate burden for the conservation of Covered Species.
- Cooperate with the City of Colton in the implementation of conservation measures within the plan area that are consistent with the conservation of the species and in a manner that minimizes the social cultural and economic impacts on the City of Colton.

Formal agreement on how these assurances are implemented with USFWS shall be set forth in an Implementing Agreement to be processed following the City of Colton's adoption of the Plan and shall accompany the Section 10(a) permit authorizing incidental take of the Covered Species as provided in the Plan.

The measures to be funded by the HCP include the acquisition of conservation lands as defined by this Plan, the monitoring and management of these conservation areas; the initial planning and restoration efforts proposed by the City of Colton to augment existing area conservation programs within the Plan boundaries; and administrative support to ensure the commitments made by the City of Colton in this Plan and accompanying documents are met. A contingency fund will also be established for responding to changed circumstances and to fund additional management actions identified by the adaptive management process.

Acquisition Funding

Acquisition of the Conservation Areas shall be funded primarily through obligations of Covered Activities. Land use designations, restrictions on development, enforcement of development standards, assessment of development fees, and implementation of avoidance, minimization and mitigation measures, provide assurances that Covered Activities will result in assembly of the Conservation Areas.

The City of Colton owns and will dedicate several parcels of land for permanent conservation. However, some of the identified conservation lands must be acquired from willing sellers by the City or through

government or private partnerships and are anticipated to be obtained in advance of development, and as described in Section 5.5. Conservation Area assembly will primarily be from lands purchased by the City with development fees collected as part of the planning process or as dedicated for conservation by Project Proponents, including the City, for Covered Activities as covered by the Plan, as a condition of the development approval process. The assurances for the assembly of Conservation Areas are provided by the City's implementation of the planning requirements for avoidance, minimization and mitigation of impacts as described in Sections 5.4 and 5.5 which are an integral component of this Plan's adoption.

Table 5 presents a summary of the land acreage that will comprise the City of Colton Conservation Area described in Section 5.5 of the Plan. Of the 416.3 acres within the Plan area, 148.5 acres contain potentially suitable DSF habitat. Through the approval and implementation of the Plan, 79.4 acres will be authorized for development and 50.3 acres will be set aside for conservation and added to the 13.3 acres of existing conservation, creating a large block of 63.6 acres of preserved DSF habitat north of the I-10 Freeway. Besides the City's contribution of conservation land, the development fee will be the primary source for the habitat acquisition program.

The fee generates revenue by multiplying the per acre fee by the estimated acres of new development. A total of 79.4 acres can be developed over the 30 year period of the Plan. The fee is assumed to increase at 3.29 percent annually.

Conservation Area Management Funding

Management of the Conservation Areas shall be funded as lands are dedicated to the Conservation Areas and shall provide for biological monitoring, restoration activities and adaptive management measures as described in Section 5.6 and subject to the provisions of this section. Conservation Area management costs shall be funded at the time of dedication or acquisition from the per acre development fee collected as part of Covered Project approvals.

Table 5: Conservation Areas Acquisition and Land Acquisition Cost

Existing Conservation	Acres	Acquisition Cost
Arrowhead Regional Medical Center	6.8	NA
“Laing” Site	4.5	NA
Valley/Pepper Site	2.0	NA
Subtotal	13.3	
Proposed Conservation	Acres	Acquisition Cost
		\$ X 261,360
WVSP West of Pepper Avenue		
Western Block (APN)		
25405148	1.3	\$ 339,768
25405149	1.3	\$ 339,768
25405163	1.5	\$ 392,040
25405164	1.6	\$ 418,176
25405165	1.6	\$ 418,176
25405166	1.5	\$ 392,040
25406102	0.8	\$ 209,088
25406103	1.1	\$ 287,496
25406136	6.0	\$ 1,568,160
25406137	2.0	\$ 522,720
25406138	2.3	\$ 601,128
WVSP West of Pepper Avenue		
Eastern Block (APN)		
25407110	5.1	\$ 1,332,936
25407129	5	\$ 1,306,800
25407151	1.8	\$ 407,448
25407157	7.2	\$ 1,881,792
25407167	1.6	\$ 418,176
25407168	0.1	\$ 26,136
Land Bridge (APN)		
25406130	0.7	\$ 182,952
Row	0.1	\$ 26,136
Arrowhead Regional Medical Center	0.8	\$ 209,088
Hermosa Garden Cemetery	7.0	NA
Subtotal	50.3	
Total	63.6	\$ 11,343,024

As part of adding acquired property into the management conservation area, newly acquired land may require restoration and/or protection to render the land usable for the intended conservation purposes. These costs primarily include the removal of invasive species such as non-native grasses and Saharan mustard, and fencing. Other costs include gates, signage, and trash removal. These costs have been incorporated into Table 6 as part of the costs for management of the conservation areas.

Once all land acquisition has been completed, the only HCP costs that remain are the continued management costs for maintaining the conservation areas and the administrative costs, discussed below, to continue the program through the 30 years of the Permit, as well as after the expiration of the Permit. The development fee will be adjusted to generate revenues sufficient to fund the continuing management costs and administrative fees after the 30 year period of the Permit. A Nexus Study is under preparation to determine the fee structure that will provide adequate funding for land acquisition, management of the conservation areas during the Permit period, administrative costs, as well as required contribution to an endowment fund that will generate sufficient interest after the expiration of the Permit to allow for the continued management of the conservation areas in perpetuity.

Monitoring and management cost estimates are presented in Table 6 and are fully detailed in Appendix A. Annual Work Plans shall be prepared to refine the budgets each year for Conservation Area management. The projections of funding for management for the Conservation Areas illustrates that adequate funding should be available to meet the management obligations of the Conservation Areas. These are based upon, or exceed, conservation management estimates. Given this, the City's assurances that such funding is adequate to manage the Conservation Areas are as follows:

1. As conservation lands are acquired, the City will estimate the costs of preparing the land based baseline conditions, habitat and restoration requirements for each parcel acquired for conservation have already been developed and implementation of a biological monitoring program, and potential adaptive management measures as defined in Sections 5.4, 5.5 and 5.6 of the HCP.
2. Funding for management of conservation lands as well as generating the long-term endowment shall be provided from the Development Fee revenues. If funding from the Development Fee is insufficient to maintain Rough Proportionality Commitment for management costs of these conservation lands the City shall:
 - a. Consider increasing the Development Fee as provided in the Conservation Area Acquisition Funding Assurance or
 - b. Delay purchase of additional conservation lands so as to provide that Development Fees collected will adequately fund management costs in perpetuity, or
 - c. Shall suspend incidental take authorizations for covered activities for the West Valley HCP area until such time as adequate funding (including but not limited to funding that may be provided by partnerships with private parties, or local, state, and/or federal agencies) can be provided to accomplish the necessary management costs for the conservation lands.

Year to year, the development fee is designed to cover the monitoring and management expenses and to contribute to the establishment of an Endowment Fund for the long-term management of all conservation areas.

Table 6: Monitoring and Management Costs

Summary by Phase			
Year 1	Acquisition Support	\$	62,753
	Biotic Surveys	\$	11,000
	Field Equipment	\$	737
	Habitat Restoration	\$	104,265
	Monitoring and Reporting	\$	46,429
	Operations	\$	27,699
	Public Services	\$	10,936
	Contingencies (22%)	\$	58,033
Period Total		\$	321,822
Reoccurring Annual Costs	Biotic Surveys	\$	1,833
	Field Equipment	\$	147
	Habitat Restoration	\$	2,797
	Monitoring and Reporting	\$	5,395
	Operations	\$	3,004
	Public Services	\$	1,270
	Contingencies (22%)	\$	3,178
	Period Totals		\$

The monitoring and management program includes an Adaptive Management component that will address management uncertainty, including the following issues:

- Management actions as responses to findings of biological monitoring in regards to unanticipated changes, in the needs of DSF or the Colton Dunes plant community, including Aeolian transport of sand;
- Reserve and species management actions;
- Enhancement of the conservation values of lands within the conservation areas; and
- Management actions to address Changed Circumstances, linking the monitoring program with Adaptive Management actions.

A contingency fee is included in the above budget to cover any identified management contingency identified as part of the monitoring and management program in order to address immediate management needs with the conservation areas.

Administrative Funding

The City of Colton shall provide administrative support to accomplish its responsibilities described in the Section 5.6 and as described in Appendix A, West Valley HCP Delhi Sand Flower-loving Fly Preserve Management Plan, including record keeping and Annual Report requirements. The City of Colton will directly assume responsibility for the costs of the first six (6) years of the plan. It is expected that on or before year seven of the HCP, all or a portion of these administrative costs shall be included within the HCP management budget. Total administrative costs are estimated to be \$15,000 annually and would include routine patrol of the property by Colton police. If this budget should not be sufficient to fund these administrative costs, the City of Colton may approve ongoing funding for administration at its discretion.

Funding Monitoring and Management Costs in Perpetuity

Since existing funding sources of revenue, in particular the development fee revenue, expire in 30 years or after all developable lands have acquired development permits, sufficient revenue must be generated in years 1 through 30 or sooner to fund monitoring and management activities after the expiration of the Permit terms or build out of the HCP area. The total amount of revenue required to yield sufficient interest was calculated using a long term averaged public funds yield assumption of 5 percent per year. Table 7 and 8 summarizes the revenues and expenditures associated with the monitoring and management funds in constant dollar.

5.7.2 - Financial Review and Plan Adjustment

The City of Colton will annually review financing the Monitoring Program, the Management Program, and required Adaptive Management Measures and update cost and financing projections as necessary during the life of the Plan. The City of Colton will make appropriate adjustments to revenue from funding sources to meet the obligations of the Plan. If a need for additional funding is projected based upon increases in costs that exceed revenue from local funding sources:

- Local funding sources will be adjusted to cover funding requirements, or
- New funding sources will be identified to supplement existing funding

5.8 Permit Duration

Implementation of this HCP is predicated on USFWS of the Plan, execution of an Implementing Agreement and issuance of a Section 10(a) Permit for a term of 30 years authorizing the City of Colton to permit or implement Covered Activities that may result in incidental take of DSF.

Table 7: Summary of Land Acquisition Revenues and Expenditures

Revenues	
Development Fee Revenue (\$156,800/Acre)	\$ 12,449,920
Total	\$ 12,449,920
Expenditures	
Land Acquisition	\$ 11,343,024
Administration	\$ 450,000
Total	\$ 11,793,024
Ending Fund Balance	\$ 656,896

Table 8: Summary of Monitoring and Management Revenues and Expenditures

Revenues	
Portion of Development Fee dedicated to Monitoring/Management	\$ 656,896
City of Colton Funding Commitment, Years 1-6	\$ 537,457
Total Revenue	\$ 1,194,353
Expenditures	
Monitoring and Management	\$ 403,954
Adaptive Management	\$ 70,103
Administrative & Security	\$ 63,400
Total Expenditures	\$ 537,457
Ending Fund Balance	\$ 656,896
Development Fee Contribution to Endowment	\$ 656,896

6 ALTERNATIVES TO THE PROPOSED ACTION CONSIDERED

Section 10(a)(2)(A)(iii) of ESA requires that an HCP specify alternative actions to the proposed taking that the applicant considered and the reasons why such alternatives are not being proposed for implementation. In addition to adoption of the HCP as proposed, the City of Colton has considered two additional alternatives. These are described below along with the reasons why they are not being utilized.

6.1 Alternative 1: No Project Alternative

The No Project Alternative entails no HCP being developed for the City of Colton and no incidental take permit(s) being issued by the USFWS to the City to authorize development within the HCP area pursuant to the provisions of the HCP. Individual project proponents would have to avoid incidental take by dedicating portions of the project site occupied by DSF as permanent open space and/or other means, or seek their own incidental take permits directly from the USFWS. Take authorization could be issued under either Section 7 or Section 10(a) of FESA, depending on whether the project has a federal nexus.

- The type of comprehensive biological assessment (determination of which lands are important for long term conservation and which can be impacted, with mitigation, without significant loss of long-term biological value) that has been conducted for this HCP would likely not be possible for individual landowners if projects were permitted on an individual basis.
- Additionally, a comprehensive system of conservation areas may not result from individual project mitigation negotiation with regulatory agencies on a case-by-case basis. Such mitigation programs often end up with isolated dysfunctional conservation areas having comparatively low long-term benefit to DSF.
- Such processing also may limit the ability to address indirect impacts to listed species from development on lands adjacent to occupied habitat. These impacts could include such things as habitat fragmentation, disruption of natural processes that sustain occupied habitat, and impacts from pets, illegal dumping, and increased risk of fire.
- Further, the No Project Alternative would not provide protection for unlisted sensitive species that inhabit the DSF conservation areas that would be protected under the proposed HCP.
- While some acquisition of remaining active blow-sand areas would likely be required as mitigation for impacts from Covered Activities, such acquisition would not likely occur in a comprehensive fashion that ensures appropriate reserve configuration, as would be provided under the proposed HCP.

At the same time, development within this area of Colton would not be well served by the No Project Alternative, as some projects and other activities would encounter conflicts with FESA because of listed species, resulting in lengthened and complicated processing and additional costs. Over time, additional species may become listed, further exacerbating the problems encountered by development and other activities. The No Project Alternative was not utilized because the City desires a comprehensive and proactive solution to endangered species issues in the City in a way that simultaneously accomplishes City General Plan objectives of balancing essential conservation and development.

6.2 Alternative 2: Regional Habitat Conservation Plan

This alternative would include the City of Colton in a San Bernardino County-wide MSHCP. The County of San Bernardino had intended to prepare a valley-wide MSHCP that would focus on the conservation of several species and associated habitats. Similar large MSHCPs have been developed in western Riverside

County and the Coachella Valley. Such an MSHCP for San Bernardino County would eventually allow the County and its cities to better control local land use decisions and maintain a strong economic climate in the region while addressing the requirements of the State and Federal Endangered Species Acts. Although the County had initiated discussions with the USFWS and negotiated a Memorandum of Understanding with most of the cities in the valley, no significant progress on preparing a valley-wide MSHCP has been made. Federal funding set aside by USFWS for this program has been withdrawn. There are no current plans by the County of San Bernardino to resume work on preparing a comprehensive valley-wide MSHCP. In order to provide some certainty in addressing endangered species issues within the City boundaries, the City of Colton feels it is imperative that it initiate its own HCP rather than wait for the County to resume its efforts. If the County of San Bernardino resumes its efforts to prepare a valley-wide MSHCP, the City of Colton will coordinate its efforts with the County MSHCP to the extent practicable.

7 CHANGED CIRCUMSTANCES

“Changed circumstances” means changes in conditions, situations, and status affecting the DSF or the geographic area covered by the HCP that can reasonably be anticipated by the City of Colton and therefore reasonably be planned for in the HCP (e.g., the listing of a new species, or a fire or other natural catastrophic event in areas prone to such event). Changed circumstances are not Unforeseen Circumstances. The City of Colton, in consultation with RBF and the USFWS, has identified several "changed circumstances" that could reasonably occur during the life of the HCP. If these circumstances occur during the life of the HCP, the City will implement the measures detailed below. The City of Colton acknowledges that the situations or circumstances described below are "changed circumstances," not unforeseen circumstances and, therefore may require additional mitigation or restrictions on project activities, as described in this HCP.

Fire or Flooding

The occurrence of a natural catastrophic event such as fire or flooding would result in temporary impacts to DSF habitat in the designated conservation areas. Habitat within a designated conservation area damaged by flood or fire will be restored, as determined by the conservation/area manager. If a flood or fire results in the removal of native vegetation and/or significant disturbance to Delhi soils, e.g., grading or excavation by heavy equipment, a restoration plan will be developed and submitted to the City of Colton and the Service for review and approval. It will follow the process described for restoration in Section 5.4.1. Restoration will be funded from the management contingency fund.

Listing of Species that are not Covered Species

If a species that does not fall under the coverage of the HCP but may be affected by activities covered by the HCP is listed under the ESA during the term of the Section 10(a)(1)(B) permit, the USFWS may consider this to be a changed circumstance. In such case, the incidental take permit will be reevaluated by the USFWS and the HCP covered activities may be modified, as necessary, to ensure that the activities covered under the HCP are not likely to result in take of or jeopardy to the non-covered species, or adverse modification of its designated critical habitat. The City would implement the modifications to the HCP covered activities identified by the USFWS as necessary to avoid the likelihood of take, jeopardy, or adverse modification of designated critical habitat. The City would continue to implement such modifications until such time as it has applied for and the USFWS has approved an amendment of the Section 10 permit, in accordance with applicable statutory and regulatory requirements, to cover the newly-listed species or until the USFWS notifies the City in writing that the modifications to the HCP covered activities are no longer required to avoid the likelihood of take of the newly-listed species.

8 UNFORESEEN CIRCUMSTANCES

Unforeseen Circumstances are discussed in the Department of the Interior's "Habitat Conservation Plan Assurances ("No Surprises") Final Rule," issued February 23, 1998 (Federal Register vol. 63, no. 35). Pursuant to the provisions of the "No Surprises Policy," in the event unforeseen circumstances affect a species covered by this HCP, the Permittee will not be required to provide additional mitigation which requires the commitment of additional lands, additional financial compensation, or additional restrictions on lands or other natural resources released for development use. Should Unforeseen Circumstances arise, changes will be limited to modifications within conserved habitat areas, or the HCP's operating conservation program for the covered species, and will maintain the original terms of the HCP to the maximum extent possible. The assurances contained in the "No Surprises Policy" apply only if the Permittee has complied with its obligations under the HCP.

9 AMENDMENT PROCESS

9.1 Minor Amendments

The City may propose minor modifications to the HCP by providing notice to the USFWS. Such notice shall include a statement of the reason for the proposed modification and an analysis of its environmental effects, including its effects on operations under the HCP and on covered species. The FWS will not propose or approve minor modifications to the HCP or this Agreement if the FWS determines that such modifications would result in operations under the HCP that are significantly different from those analyzed in connection with the original HCP, adverse effects on the environment that are new or from those analyzed in connection with the original HCP, adverse effects on the environment that are new or significantly different from those analyzed in connection with the original HCP, or additional take not analyzed in connection with the original HCP.

Examples of minor amendments to the HCP that would not require permit amendment include, but are not limited to: 1) minor revisions to survey, monitoring, and/or reporting protocols; 2) minor revisions in project maintenance procedures, and 3) minor revisions of the HCP's plan area or boundaries.

To amend the HCP without amending the permit, the City must submit to the USFWS, in writing: 1) a description of the proposed amendment; 2) an explanation of why the amendment is necessary or desirable; and 3) an explanation of why the effects of the proposed amendment are not significantly different from those described in the original HCP. If the USFWS concurs with the proposed amendment, it shall authorize the HCP amendment via a written letter or memorandum, and the amendment shall be considered effective upon the date of the USFWS written authorization.

9.2 Major Amendments

Amendments that do not fit the definition of a minor amendment will be processed as major amendments in accordance with all applicable legal requirements, including but not limited to the Federal Endangered Species Act, the National Environmental Policy Act, and the USFWS permit regulations. Major permit amendments require written notification to the USFWS and the same justification and supporting information for compliance with a standard incidental take permit application, including conservation planning requirements, compliance with issuance criteria, and NEPA evaluation.

When the USFWS or the City of Colton believes that a major amendment to the HCP is required the City of Colton will prepare the appropriate documentation for submission to the Service. The documentation will include a description of the event or activity and an assessment of its impacts. The amendment will describe changes to the mitigation measures to ensure that the DSF is appropriately conserved.

10 PERMIT RENEWAL OR EXTENSION

The permit may be renewed or extended with the approval of the Service. The request to renew or extend the permit must be submitted in writing by the applicant and reference the permit number; certify that all statements and information in the original application are still correct or include a list of changes; and provide specific information concerning what take has occurred under the existing permit and what portions of the project are still to be completed. The request must be made to the Palm Springs Fish and Wildlife Office at least 30 days prior to the permit's expiration date. As long as the request is received within 30 days prior to the permit expiration date, the permit shall remain valid while the renewal or extension is being processed. The renewal or extension must be approved in writing by the Deputy Regional Director of the Service's Pacific Southwest Regional Office.

11 OTHER MEASURES

Section 10(a)(2)(A)(iv) of the ESA states that a HCP must specify other measures that the Director may require as being necessary or appropriate for purposes of the plan. The applicant will submit a draft Implementing Agreement for the proposed HCP's permitted activities, for review and approval by the USFWS and the public. Final implementation measures for the HCP will be developed by the Service in coordination with the applicant. No other additional required measures have been identified by the Director for this project

12 DEFINITIONS

Endangered Species – “...any species [including subspecies or qualifying distinct population segment] which is danger of extinction throughout all or a significant portion of its range.” [Section 3(6) of ESA]

Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1513-1543) – Federal legislation that provides means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, and provides a program for the conservation of such endangered and threatened species.

Habitat – The location where a particular taxon of plant or animal lives and its surroundings, both living and non-living; the term includes the presence of a group of particular environmental conditions surrounding an organism including air, water, soil, mineral elements, moisture, temperature, and topography.

Habitat Conservation Plan (HCP) – Under section 10(a)(2)(A) of the ESA, a planning document that is a mandatory component of an incidental take permit application, also known as a HCP.

Implementing Agreement – An agreement that legally binds the Permittee to the requirements and responsibilities of a conservation and Section 10 permit. It may assign the responsibility for planning, approving, and implementing the mitigation measures under the HCP.

Incidental take – Take of any federally listed wildlife species that is incidental to, but not the purpose of, otherwise lawful activities (see definition for “take”) [ESA section 10(a)(1)(B)].

Incidental take permit – A permit that exempts a permittee from the take prohibition of Section 9 of the ESA issued by the FWS pursuant to section 10(a)(1)(B) of the ESA.

Listed species – Species including subspecies and distinct vertebrate populations, of the fish, wildlife, or plants, listed as either endangered or threatened under section 4 of the ESA.

Mitigation – Under NEPA regulations, to moderate, reduce or alleviate the impacts of a proposed activity, including: a) avoiding the impact by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action; c) rectifying the impact by repairing, rehabilitating or restoring the affected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; e) compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20).

National Environmental Policy Act (NEPA) – Federal legislation establishing national policy that environmental impacts will be evaluated as an integral part of any major Federal action. Requires the preparation of an EIS (Environmental Impact Statement) for all major Federal actions significantly affecting the quality of the human environment (42 U.S.C. 4321-4327).

Take – Under section 3(18) of the ESA, “... to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” with respect to federally listed endangered species of wildlife. Federal regulations provide the same taking prohibitions for threatened wildlife species [50 CFR 17.31(a)].

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Appendix A

West Valley HCP
Delhi Sands Flower-loving Fly (DSF) Preserve Management Plan
City of Colton, San Bernardino County, California

Riverside Land Conservancy
September 2012

INTRODUCTION

There are five conservation areas organized into four distinct management units. Exhibit 1 shows the location of each of the conservation areas and proposed management units:

- Unit 1: the San Bernardino Avenue Management Unit includes two conservation areas, the Indigo Avenue Conservation Area in the northwest corner of the Plan boundaries and King is Coming Conservation Area located to the east of the Indigo Conservation Area. These two conservation areas are connected by a land bridge designed to support DSF movement between the two areas
- Unit 2: the Valley Blvd management area that includes the Hospital Reserve Conservation Area and a 2-acre parcel set aside by the County of San Bernardino for the realignment of Valley Blvd;
- Unit 3: the Hermosa Cemetery Management Unit that is comprised of a 9 acres of occupied DSF habitat located in the southeast corner of the cemetery; and
- Unit 4: the Slover Avenue Management Unit, a 4.5 acre linear parcel along Slover Avenue that will be abandoned to allow sand movement across the road south into the Colton Dunes Conservation Bank.

All proposed restoration and maintenance activities will take place outside of the general DSF flight season (July 1 - September 30), unless urgent action is required.

SITE RESTORATION

Site Restoration Goal 1: Restore native habitat and vegetation in order to re-establish high quality DSF habitat.

Objective 1: Achieve 20-50% overall coverage of native shrubs.

Task 1: Establish at least one vegetation transect line for documenting baseline conditions and for conducting subsequent annual assessments within each conservation area or management unit. Additional transects to be established, as necessary, to track changes in habitat restoration areas; details of survey methodology (e.g. line-intercept) to be determined by qualified botanist/plant ecologist; at least two transect lines will be established in each conservation area or management unit (see below).

Task 2: Record shrub coverage and species composition as part of documenting baseline conditions.

Task 3: If coverage is over 50%, selectively remove shrubs by hand; selection of shrubs to be overseen by permitted DSF biologist and/or native plant botanist.

Task 4: If coverage is under 20%, plant seeds and/or potted seedlings obtained through onsite seed collection or by seed collection on nearby sites, as determined by permitted DSF biologist and/or native plant botanist.

Objective 2: Achieve less than 20% coverage of non-native vegetation.

Task 1: Assess the non-native coverage and species composition utilizing above-referenced transect lines.

Task 2: If non-native coverage is greater than 20%:

a. In areas dominated by non-native invasive grasses and other ruderal species, removal may be done by selective use of herbicides in coordination with USFWS.

i. Current herbicides anticipated for use are Fusillade, Roundup (glyphosate)

ii. Should additional herbicides be required for use, they will be according to label.

No herbicides known to be toxic to insects or other invertebrates will be used.

b. In higher quality habitat areas (rated as high or moderate quality) removal will be done only by hand (this may include hand application of herbicides). The person removing the vegetation will be knowledgeable of DSF and the native vegetation it is associated with, or they work under the direct supervision of someone with such knowledge.

Task 3: Remove surface organic material (including dead exotic vegetation) and dispose off-site if necessary, i.e., the biomass of the material is such that, in the opinion of the land manager for RLC, it is not expected to break down and become part of the soil within a year's time.

Site Restoration Goal 2: Restore/maintain a structurally diversified nature plant community within all conservation areas and/or management units.

Objective 1: Achieve vegetation diversity within each conservation areas or management units.

Task 1: From documentation of the baseline condition, assess the vegetative composition within each Management Unit. Diversity of coverage and species composition should be goal, with any one species coverage constituting no more than 25% of any management unit; except California buckwheat (*Eriogonum fasciculatum*), which may constitute no more than 50% coverage of any management unit.

Task 2: Species comprising greater than 35%, except California buckwheat, should be selectively thinned by hand;

Task 3: Planting of under-represented species will done under the guidance of the permitted DSF biologist and/or native plant botanist.

Task 4: Create and/or maintain patchy vegetative coverage within each management Unit. Open linear areas are necessary for DSF viability. This would include establishing/maintaining linear openings among shrubs as fly-ways. The exact size and location of linear openings to be created and/or maintained will be intended to mimic nearby high and moderate quality habitat.

Site Restoration Goal 3: Control impacts of trash, trespass and other human intrusion into DSF habitat.

Objective 1: Secure site.

Task 1: Install fencing around the various conservation properties or management units;

Task 2: Prohibit unauthorized access.

Task 3: Install signage along the boundaries of each conservation area to ensure that build-out of the West Valley Specific Plan area does not encroach onto conservation areas.

Task 4: Patrol area on semi-annual basis, or as needed to maintain security.

Objective 2: Remove all signs of human disturbances.

Task 1: Collect trash and other debris onsite by hand, where feasible.

Task 2: Removal of trash may be done by machine if:

- i. Individual items weigh over 50 pounds, or cannot easily be carried off-site by 1 individual.
- ii. A qualified biological monitor will be present to ensure trash removal operations will not impact DSF habitat and adversely affect the conservation value of sites.

PERPETUAL SITE MANAGEMENT

Site Management Goal 1: Document site biological value.

Objective 1: Collect and maintain data relative to vegetative diversity and habitat quality.

Task 1: Conduct annual vegetation transect survey to monitor changes in native vegetation density and diversity.

- a. At least one transect will be utilized, traversing the length of each conservation area from north to south (see Site Restoration Goal 1, Objective 1, Task 1).
- b. Transects will be situated to include all prominent vegetation communities and re-vegetated areas.

Task 2: Establish permanent photo points to document site conditions; take photographs annually from photo points to document habitat values and changed conditions including conditions on each transect line.

Task 3: Tabulate transect results and determine vegetation changes.

Task 4: Prepare annual report utilizing transects and photo points to record changes over time and to provide data for annual vegetation management assessment.

Task 5: Submit copies of annual report, with copies to USFWS and the City of Colton.

Objective 2: Collect and maintain data relative to DSF viability on-site.

Task 1: Conduct focused surveys every 3 years.

- a. Surveys shall be conducted by a biologist permitted by the USFWS to conduct DSF surveys or a biologist otherwise considered qualified by the USFWS to conduct such surveys.
- b. Field surveys shall occur 1st week August, 3rd week August, 1st week September, unless special circumstances require a change as agreed to by USFWS and RLC.
- c. Surveys shall be conducted between the hours of 10:00am and 2:00pm, under full sun with temperatures at 90° or above and winds less than 5 miles per hour.
- d. Surveys shall be conducted by walking the perimeter of the conservation area and along the vegetation transects twice each visit.

- e. Record survey evidence of any DSF and other typically associated insects observed, such as *Thyridanthrax atra*, *Apiocera chrysolasia*, *A. convergens*, and *Nemomydas pantherinus*.
- f. Should survey protocol indicated above not produce necessary data or require further modification, RLC shall submit a request in writing to USFWS. USFWS shall approve such request in writing if request is reasonable.

Task 2: Should biotic survey show no evidence of DSF activity, annual surveys will be conducted until presence of DSF has been revalidated through survey findings.

- a. The RLC will contact the USFWS to discuss appropriate actions should surveys fail to detect DSF for 3 consecutive years.

Task 3: Submit reports to USFWS and the City of Colton

Site Management Goal 2: Maintain appropriate vegetation community for DSF.

Objective 1: Maintain 20-50% coverage of native shrubs. (Continue "Site Restoration" tasks as identified above under Site Restoration Goal 1, Objective 1)

Objective 2: Maintain non-native coverage of less than 20%. (Continue "Site Restoration" tasks as identified above Site Restoration Goal 1, Objective 1)

Objective 3: Maintain native vegetation diversity. (Continue "Site Restoration" tasks as identified above Site Restoration Goal 1, Objective 2)

Site Management Goal 3: Control impacts of trash and trespass.

Objective 1: Secure site.

Task 1: Repair signage detailing nature of site as endangered species preserve and private property, as necessary.

Task 2: Patrol area on semi-annual basis (about 6 months after vegetation transect surveys)

Task 3: Should trespass have adverse impact on habitat, coordinate with the City of Colton and USFWS to implement corrective measures.

Objective 2: Remove all signs of human disturbance.

Task 1: Collect trash, by hand whenever feasible unless otherwise approved by USFWS.

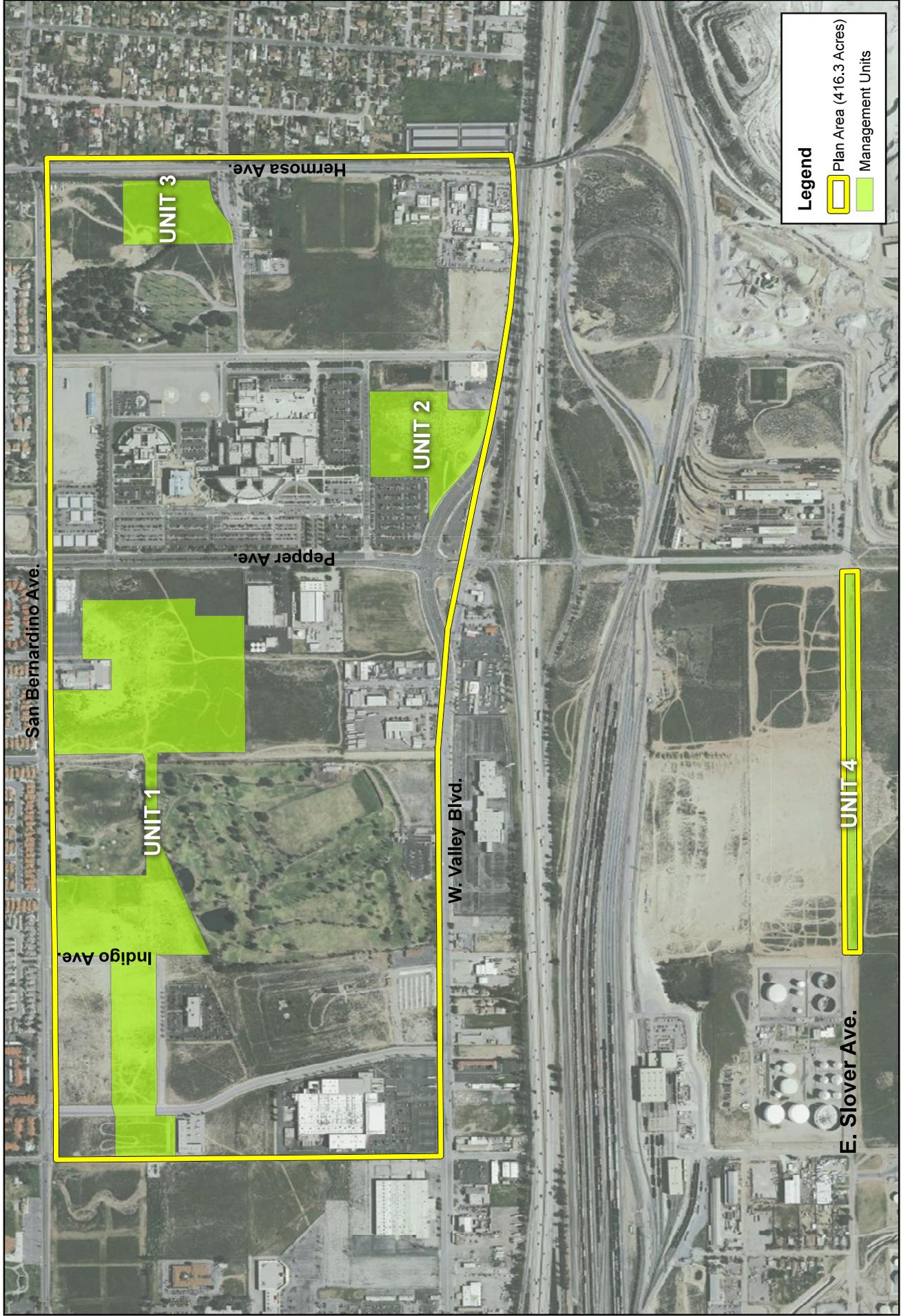
Task 2: A qualified biological monitor will be present to ensure that trash removal operations will not compromise the conservation value of the conserved habitat.

Site Management Goal 4: Implement adaptive management, as required, based on the results of the preceding management actions, ongoing conservation and management of DSF lands nearby and in the surrounding region, changes in the understanding of DSF ecology, and other relevant factors.

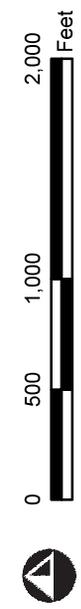
Task 1: An annual work plan will be prepared to address ongoing management actions as well as any identified adaptive management action needed to as a corrective measure.

West Valley HCP Area
 Delhi Sands Flower-loving Fly (DSF) Preserve Management Plan
Management Task and Activity Summary

Management Task	Management Activities
Vegetation Management	<ul style="list-style-type: none"> • Remove native shrubs if cover exceeds 50% • Plant native shrubs (seeds or potted seedlings) if cover is less than 20%; use local source for collection of propagules • Remove non-native species if cover exceeds 20%. Use herbicide in areas of dense non-native cover, removal by hand where native cover is mixed with non-native • Remove and properly dispose of plant material that has been trimmed, treated with herbicide, pulled, or otherwise eradicated
DSF Surveys	<ul style="list-style-type: none"> • Abbreviated DSF survey every 3 years by USFWS-qualified biologist, prepare report for file and submit to USFWS and the City of Colton if requested • If no evidence of DSF, conduct annual focused surveys until DSF presence revalidated (advise USFWS if DSF not present after 3 consecutive years)
Habitat Enhancement	<ul style="list-style-type: none"> • Create flyways to mimic natural conditions
Monitoring	<ul style="list-style-type: none"> • Vegetation transects - monitor native and non-native vegetation, with conservation area or management unit, to determine changes in vegetation year-to-year; set permanent transect locations within each management unit to allow repetitive sampling each year • Set permanent photo points including all vegetation transects and vantage points; take photos from each point annually • 2 monitoring visits per year plus 2 follow-up visits per year, as-needed, to verify implementation of any corrective measures • Prepare report for file and submit to USFWS and the City of Colton
Trespass Control	<ul style="list-style-type: none"> • Install signage designating conservation areas as DSF habitat (repair/replace signage as needed) • Install and maintain fencing along each conservation area or management unit. Repair/replace fencing and signs as needed. • Patrol as part of monitoring visits to maintain security
Debris and Trash Cleanup	<ul style="list-style-type: none"> • Organic debris removal annually as part of vegetation management • Trash removal annually (by hand or machine depending on volume), have qualified monitor present to minimize impacts to DSF habitat
Management Planning	<ul style="list-style-type: none"> • Prepare an annual management plan every year.



DELHI SANDS FLOWER-LOVING FLY PRESERVE MANAGEMENT PLAN
Management Units



Appendix B

Section 16 - Financial Summary

Property Title: Colton HCP Draft PAR v.02 27Mar2014

Date: 03/28/2014

1st Budget Year: 2014

State: CA

PAR Code: ColHCP02

<i>Item Descriptions</i>	<i>Total</i>
<i>Initial & Capital Financial Requirements</i>	
Revenues	\$0
Management Costs	\$221,786
Contingency Expense	\$42,003
<i>Initial & Capital Management Total Costs</i>	\$263,788
Administrative Costs of Total Management Costs	\$58,033
<i>Initial & Capital Gross Costs</i>	\$321,822
<i>Initial & Capital Net Costs</i>	\$321,822
<i>Annual Ongoing Financial Requirements</i>	
Revenues	\$0
Ongoing Costs	\$12,921
Contingency Expense	\$1,525
<i>Ongoing Management Total Costs</i>	\$14,446
Administrative Costs of Total Management Costs	\$3,178
<i>Ongoing Gross Costs</i>	\$17,624
<i>Ongoing Net Costs</i>	\$17,624
<i>Endowment Requirements for Ongoing Stewardship</i>	
<i>Endowment to Produce Income of \$17,624</i>	\$440,612
<i>Endowment per acre \$8,812</i>	
<i>Stewardship costs are based on 4.00% of Endowment Earnings per Year</i>	
<i>Ongoing management funding per year is \$17,624</i>	
<i>Resulting in a per acre per year cost of \$352</i>	
<i>Total Funding Required</i>	\$762,434

Section 14 - Initial & Capital Tasks and Costs

Property Title: Colton HCP Draft PAR v.02 27Mar2014

PAR ID: ColHCP02 03/28/2014

Task List	Specific Description	Unit	Quantity	Cost / Unit	Annual Cost	Times Years	Cont %	Total Cost
ACQUISITION								
Evaluation	Discovery and Legal	L. Hours	96.00	140.48	13,486.08	1.0	10.0	14,834.68
Evaluation	Discovery and Site Visit	L. Hours	94.00	152.15	14,302.10	1.0	10.0	15,732.31
Legal Assistance	Prepare/review Documents	C. Hours	76.00	385.00	29,260.00	1.0	10.0	32,186.00
Sub-Total								62,752.99
BIOTIC SURVEYS								
Entomologist	Abbreviated DSF Survey	C. Hours	50.00	100.00	5,000.00	2.0	10.0	11,000.00
Sub-Total								11,000.00
FIELD EQUIPMENT								
Camera - Digital	Low end camera	Item	1.00	20.00	20.00	10.0	10.0	220.00
Gps	Field Gps Unit	Item	1.00	20.00	20.00	10.0	10.0	220.00
Vehicle	Mileage (2 WD)	Miles	500.00	0.54	270.00	1.0	10.0	297.00
Sub-Total								737.00
HABITAT RESTORATION								
Bid Documents	Plans & Specs	L. Hours	40.00	66.23	2,649.20	1.0	10.0	2,914.12
Bid Documents	Plans & Specs	L. Hours	10.00	152.15	1,521.50	1.0	10.0	1,673.65
Clearing	Shrub Removal by Hand	Contractor	1.00	5,000.00	5,000.00	1.0	10.0	5,500.00
Construction Scheduling	Coordinate W/subs	L. Hours	40.00	66.23	2,649.20	1.0	10.0	2,914.12
Exotic Plant Control	Boom Spray	Acre	141.60	350.00	49,560.00	1.0	50.0	74,340.00
Seeding	Hand seeding	L. Hours	4.00	65.00	260.00	10.0	10.0	2,860.00
Seeding	Seedmix	Acre	1.00	1,278.42	1,278.42	10.0	10.0	14,062.62
Sub-Total								104,264.51
MONITORING AND REPORTING								
Baseline	Field Survey	L. Hours	32.00	66.23	2,119.36	1.0	10.0	2,331.29
Baseline	Field Survey	L. Hours	32.00	152.15	4,868.80	1.0	10.0	5,355.68
Baseline	Report Preparation	L. Hours	24.00	152.15	3,651.60	1.0	10.0	4,016.76
Baseline	Report Preparation	L. Hours	108.00	66.23	7,152.84	1.0	10.0	7,868.12
Management Plan	Initial Report	L. Hours	16.00	152.15	2,434.40	1.0	10.0	2,677.84
Monitoring	Semi-annual Monitoring	L. Hours	140.00	66.23	9,272.20	1.0	10.0	10,199.42
Monitoring	Semi-annual Monitoring	L. Hours	20.00	152.15	3,043.00	1.0	10.0	3,347.30
Monitoring Report	Report Preparation	L. Hours	100.00	66.23	6,623.00	1.0	10.0	7,285.30
Monitoring Report	Report Preparation	L. Hours	20.00	152.15	3,043.00	1.0	10.0	3,347.30
Sub-Total								46,429.02
OPERATIONS								
Archiving	Archive & Filing	L. Hours	20.00	55.00	1,100.00	1.0	10.0	1,210.00
Budgeting	Budget & Reconcile	L. Hours	20.00	55.00	1,100.00	1.0	10.0	1,210.00
Insurance	Conservation Easement	Item	5.00	60.00	300.00	1.0	10.0	330.00
Legal & Emergency Fund	Establish Fund 1%	1% endow.	1.00	4,406.00	4,406.00	1.0	10.0	4,846.60
Project Accounting	Endowment Reporting	L. Hours	30.00	140.48	4,214.40	1.0	10.0	4,635.84
Project Management	Manage various elements	L. Hours	12.00	66.23	794.76	10.0	10.0	8,742.36
Project Management	Manage various elements	L. Hours	4.00	152.15	608.60	10.0	10.0	6,694.60
Sub-Total								27,669.40
PUBLIC SERVICES								
Community Outreach	Meetings	L. Hours	2.00	152.15	304.30	10.0	10.0	3,347.30
Community Outreach	Meetings	L. Hours	8.00	66.23	529.84	10.0	10.0	5,828.24

Section 14 - Initial & Capital Tasks and Costs

Property Title: Colton HCP Draft PAR v.02 27Mar2014

PAR ID: ColHCP02 03/28/2014

Task List	Specific Description	Unit	Quantity	Cost / Unit	Annual Cost	Times Years	Cont %	Total Cost
Signage	Installation & Maintenance	Item	40.00	40.00	1,600.00	1.0	10.0	1,760.00
	Sub-Total							10,935.54
Subtotal								263,788.46
Administration								58,033.46
Total								321,821.93

Section 15 - Ongoing Tasks and Costs

Property Title: Colton HCP Draft PAR v.02 27Mar2014

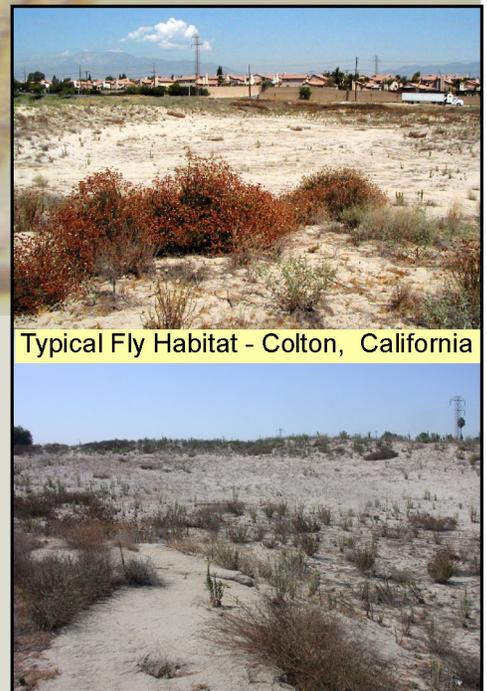
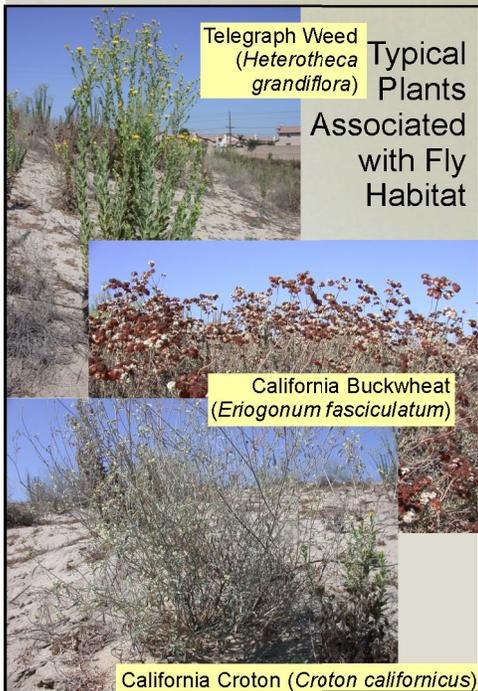
PAR ID: ColHCP02 03/28/2014

Task List	Specific Description	Unit	Number of Units	Cost / Unit	Annual Cost	Years Divide	Cont %	Total Cost
BIOTIC SURVEYS								
Entomologist	Abbreviated DSF Survey	C. Hours	50.00	100.00	5,000.00	3.0	10.0	1,833.33
Sub-Total								1,833.33
FIELD EQUIPMENT								
Camera - Digital	Low end camera	Item	2.00	20.00	40.00	1.0	10.0	44.00
Gps	Field Gps Unit	Item	2.00	20.00	40.00	1.0	10.0	44.00
Vehicle	Mileage (2 WD)	Miles	100.00	0.54	54.00	1.0	10.0	59.40
Sub-Total								147.40
HABITAT RESTORATION								
Bid Documents	Plans & Specs	L. Hours	4.00	152.15	608.60	5.0	10.0	133.89
Bid Documents	Plans & Specs	L. Hours	16.00	66.23	1,059.68	5.0	10.0	233.12
Clearing	Shrub Removal by Hand	Contractor	1.00	5,000.00	5,000.00	5.0	10.0	1,100.00
Construction	Coordinate W/subs	L. Hours	8.00	66.23	529.84	5.0	10.0	116.56
Exotic Plant Control	Boom Spray	Acre	5.00	350.00	1,750.00	3.0	50.0	875.00
Seeding	Hand seeding	L. Hours	4.00	65.00	260.00	5.0	10.0	57.20
Seeding	Seedmix	Acre	1.00	1,278.42	1,278.42	5.0	10.0	281.25
Sub-Total								2,797.03
MONITORING AND REPORTING								
Management Plan	5-Year Update	L. Hours	8.00	152.15	1,217.20	5.0	10.0	267.78
Monitoring	Semi-annual Monitoring	L. Hours	4.00	152.15	608.60	1.0	10.0	669.46
Monitoring	Semi-annual Monitoring	L. Hours	32.00	66.23	2,119.36	1.0	10.0	2,331.29
Monitoring Report	Report Preparation	L. Hours	4.00	152.15	608.60	1.0	10.0	669.46
Monitoring Report	Report Preparation	L. Hours	20.00	66.23	1,324.60	1.0	10.0	1,457.06
Sub-Total								5,395.06
OPERATIONS								
Archiving	Archive & Filing	Not	4.00	55.00	220.00	1.0	10.0	242.00
Budgeting	Budget & Reconcile	L. Hours	4.00	55.00	220.00	1.0	10.0	242.00
Insurance	Conservation Easement	Item	5.00	60.00	300.00	1.0	10.0	330.00
Insurance	Liability/conserv.	Acre	50.00	0.19	9.50	1.0	10.0	10.45
Project Accounting	Endowment Reporting	L. Hours	6.00	140.48	842.88	1.0	10.0	927.16
Project Management	Manage various elements	L. Hours	8.00	66.23	529.84	1.0	10.0	582.82
Project Management	Manage various elements	L. Hours	4.00	152.15	608.60	1.0	10.0	669.46
Sub-Total								3,003.90
PUBLIC SERVICES								
Community Outreach	Meetings	L. Hours	8.00	66.23	529.84	1.0	10.0	582.82
Community Outreach	Meetings	L. Hours	2.00	152.15	304.30	1.0	10.0	334.73
Signage	Installation & Maintenance	Item	40.00	40.00	1,600.00	5.0	10.0	352.00
Sub-Total								1,269.55
Subtotal								14,446.28
Administration								3,178.18
Total								17,624.47

Delhi Sands Flower-loving Fly
(*Rhaphiomidas terminatus abdominalis*)
2010 Comparative Analysis Survey of Two Sites in
Colton, California

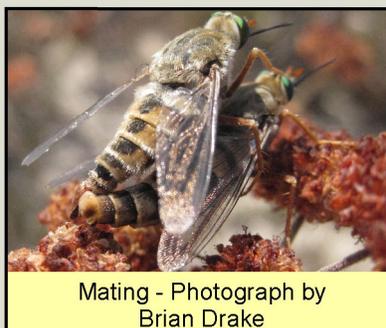
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September 29, 2010

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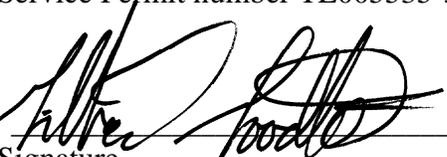
CERTIFICATIONS

I, **Brian Drake**, having performed focused surveys for the Delhi Sands Flower-loving Fly at the location covered in this report, have entirely read and reviewed the final report for the project and concur with the statements and conclusions made. A portion of this work was performed under U.S. Fish and Wildlife Service Permit number TE-006328-4, expiring 6/21/2013.


Signature

September 29, 2010
Date

I, **Gilbert O. Goodlett** of EnviroPlus Consulting, having performed focused surveys for the Delhi Sands Flower-loving Fly and prepared the report for the location covered in this report have entirely read and reviewed the final report for the project and concur with the statements and conclusions made. A portion of this work was performed under U.S. Fish and Wildlife Service Permit number TE005535-3 expiring 7/29/2011.


Signature

September 29, 2010
Date

EXECUTIVE SUMMARY

Surveys were conducted at two sites for comparison between August 1 and September 20, 2010. Both sites are located immediately south of San Bernardino Avenue between Pepper and Riverside Avenues in Colton, California. One is east of George Brown Park and the other is west of the park. In the area east of the park, 43 Delhi Sands Flower-loving Fly (DSF) observations were made while, in the area west of the part, 32 DSF observations were made. DSF were found distributed throughout the area east of the park but were only found in a little less than half of the site west of the park (east of Indigo Avenue). Since a portion of the survey effort was spent in this non-productive area, this may explain why the DSF observation count was lower in this area.

DSF observations rates were compared at four occupied sites surveyed in 2010. The area east of the park ranked first (5.57 DSF/day) while the area west of the park ranked second (3.71 DSF/day). Separate species lists (invertebrates, birds, mammals, reptiles) were kept for each site. No significant difference was found in the average number of species encountered at each site.

BACKGROUND

Delhi Sands Flower-loving Fly

The Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (DSF) was listed as an endangered species by the U.S. Fish and Wildlife Service (Service) on September 23, 1993 (58 Federal Register 49881) and is protected under the provisions of the Endangered Species Act of 1973, as amended (ESA). The ESA prohibits anyone from “taking” a listed species. Take includes, but is not limited to, harming, harassing, or killing individuals of a listed species as well as destruction of habitat occupied by listed species.

The DSF is in the Dipteran (fly) family Mydidae (mydas flies). It is approximately one-inch long and orange-brown in color, with dark brown oval spots on the dorsal surface of the abdomen (inset cover photographs). This insect is a rapid flyer and its long proboscis is used to obtain nectar from flowers. The adult flight period lasts for several weeks in July, August, and September, making its observable presence on any site temporary and short.

The historic range of the DSF is estimated to have been approximately 40 square miles in northwestern Riverside and southwestern San Bernardino counties (USFWS, 1996). Habitat has been lost and fragmented by a variety of activities/circumstances including agriculture, manure dumping, urbanization, sand-mining, illegal dumping, off-road vehicles, and non-native plant invasion. It is estimated that the DSF’s present distribution is less than 2% of its former range, and that the total adult population is on the order of only a few hundred individuals. Known current DSF populations occur in isolated pockets of habitat surrounded by urban development and invasive exotic vegetation (USFWS, 1997).

DSF habitat is limited to areas that include Delhi fine sand, an aeolian (wind-deposited) soil type. The Service has identified the presence of Delhi Sands as the baseline criterion for the determination of suitable or potentially suitable habitat for this species (USFWS, 1996). Fine unconsolidated soil is required for oviposition (egg laying) as females must insert their abdomens deep into the sand during this process (Rogers and Mattoni, 1993). The larval portion

of the DSF's life cycle is largely unknown. Larval development apparently takes place in the sand and is presumed to take either one or two years. Soil disturbances associated with agricultural activities and urban development are primary causes of habitat loss and degradation.

Appropriate vegetative cover is typically sparse (0 to 50% cover) to absent (in blowout areas of dune formations and sand pits). The highest density of DSF have been found in habitat that includes a variety of plants including California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), and telegraph weed (*Heterotheca grandiflora*; see inset cover photographs).

Areas known to have been occupied by DSF or areas that contain restorable habitat for the fly have been divided into three recovery units (Colton, Jurupa, and Ontario Recovery Units). The recovery units (Figure 1) are defined as large geographic areas. However, the occupied and restorable habitat includes only those areas with Delhi Series soils and does not include residential or commercial development or other areas that have been permanently altered by human actions (USFWS, 1997).

Survey Protocols

The Service has developed specific standards for conducting DSF surveys with specific report requirements (1996), as amended. Because this survey was a comparative analysis rather than a protocol survey, there was no requirement to follow the established protocols. However, these protocols represent sound biological survey practices and were followed except as noted below.

For DSF surveys these standards include the following:

1. Surveys must be conducted by a permitted biologist. Permits are acquired through a testing procedure administered by the Service.
2. Surveys must be conducted at least twice a week from July 1 to September 20 between the hours of 1000 and 1400 PDT. No more than 50 acres per day may be surveyed by an individual biologist. Surveys at these sites were conducted between August 1 and September 20 and while the survey area was generally limited to less than 50 acres per day occasional forays were made into adjacent areas where the 50 acre limit was exceeded.
3. Two consecutive years of surveys with no DSF observed are required to establish absence of the species. Presence is established at these sites.
4. Approval to conduct a DSF survey at a site must be obtained from the Service by submitting specific project information to the Service at least 10 working days prior to the anticipated start of the survey.
5. Surveys must be conducted at a relatively slow pace with care taken to avoid harassing any DSF that are located.
6. The Service must be notified within one working day if DSF are observed at a site.

For DSF reports the Service requires the following:

1. Submission of reports to the Service and the California Department of Fish and Game within 30 days of the completion of surveys.

2. A map delineating the boundaries of the site on a 7.5 minute U.S. Geological Survey topographic map.
3. Five color slides or similar photographic material of the site. Two of these are to portray the general landscape of the site and three are to show representative areas within the site that were surveyed for the animal.
4. A map at an adequate scale that indicates the precise location where DSF were located.
5. A qualitative description of the DSF community on the site and a list of plants, reptiles, birds, mammals, and invertebrates observed.
6. A description of methods utilized.
7. Dates and times of field visits, size of habitat surveyed, and weather conditions at the start and end of each survey.
8. Reporting any other significant observations relative to the survey.
9. Completing forms utilized by the Natural Diversity Data Base of the California Department of Fish and Game.
10. Photocopies of original field notes.

The Service standards allow for specific deviations from the protocols at the discretion of the Service. Provisions are also made for rejection of surveys if protocol methodology is not followed, the report is not completed within the time frame allocated, required information is not provided, or other information indicates that the survey is inadequate as determined by the Service.

SITE DESCRIPTION

The study area is located in the City of Colton within an area known as the Superblock bounded by San Bernardino Avenue on the north, Pepper Avenue on the west, Valley Avenue on the south, and Riverside Avenue on the west. Cadastrally the site is located in the northern ½ of Section 24 of Township 1 South, Range 5 West, San Bernardino County and lies within the Colton Recovery Unity as designated in the Recovery Plan for the species (USFWS, 1997; Figure 1).

The study area is divided into two sites separated by George Brown Park. The site east of the park is nominally 14.8 acres with occasional surveys within an additional 20.2 acres (Figure 2). Elevations on the site range from 1,076 ft at the southeast corner of the property to 1,102 ft at the northeast corner of the property. The terrain is dune formation with no drainage pattern evident. The substrate consists of Delhi-series fine sands.

Vegetation on the site is mostly native with a small ruderal component. Dominant components of the vegetation include California buckwheat (*Eriogonum fasciculatum*), telegraph weed (*Heterotheca grandiflora*), and California croton (*Croton californicus*). These three species are typically found on occupied DSF sites. Annual grasses had dried and gone to seed prior to the survey but remnants of ripgut grass (*Bromus diandrus*), Mediterranean grass (*Schismus* sp.), and wild oat (*Avena* sp.), all invasive species, were present. Other non-native components included tumbleweed (*Amaranthus albus*), mustard (*Brassica* sp.), shortpod mustard (*Hirschfeldia incana*), redstem filaree (*Erodium cicutarium*), and puncture vine (*Tribulus terrestris*). A plant list is presented in Table 2.

Vegetative cover varied widely at this site ranging from 0% to nearly 100%. There are two primary open sand areas on either side of the former Carpenter's Union building north of the site. Generally vegetative cover increased as the distance from the dune areas increased.

Evidence of human affects on the site was common. Two dirt roads, one of which is the extension of the paved Eucalyptus Avenue to the north, traverse north-south near the western border of the site along two existing power lines. Vehicles were observed on several occasions along the road. A homeless individual was observed living in a depression in the eastern portion of the study area near Pepper Avenue.

The second site is west of George Brown Park and is 27.1 acres in size (Figure 3). Elevations on the site range from 1,084 ft at the southernmost point of the property to 1,122 ft at the northeast corner of the property. The terrain on this site has been altered at some time in the past. Immediately west of the park is a depression with high vegetation density. It appears that this area may have been a borrow site for soil. West of this area and east of Indigo Avenue, the terrain is divided into three terraces with the lowest elevation terrace in the south and the highest elevation terrace in the north. West of Indigo Avenue and east of Wildrose Avenue, the terrain has been altered into two terraces, a lower one in the south and a higher one in the north.

The vegetative component at this site is similar to the site east of George Brown Park but the distribution differs. Vegetative cover in the apparent borrow site immediately west of the park is high at approximately 40% with little exposed soils. Within the terraces west of this area, the vegetative cover is much lower at approximately 15%. The upper terrace has a higher density of telegraph weed and lower density of California buckwheat than the two lower terraces. There are numerous areas of exposed soils on all three terraces. West of Indigo Avenue and east of Wildrose Avenue, the vegetative cover is even lower than the terraces at about 10% with fewer individuals of California buckwheat, telegraph weed, and California croton than the area east of Indigo Avenue.

Human impacts were relatively common at the site. Numerous trails occur on the site and individuals were seen walking through the site during the survey. Illegal dumping is prevalent along Indigo Avenue and particularly at the intersection with Woodbine Avenue. A homeless individual was observed living under a tree just off the southwest corner of the park on the site.

OBJECTIVE

The objective of the study was to compare the number of observations of DSF as well as more general invertebrate species density and diversity between a known occupied site (east of George Brown Park) and an area of similar habitat that had not been surveyed in many years (west of George Brown Park). The study is motivated by the City of Colton's desire to develop a habitat conservation plan for the area and the U.S. Fish and Wildlife Service's interest to assess the potential for DSF within the area.

METHODS

Site Selection

The sites selected for survey were chosen by Eric Porter with the U.S. Fish and Wildlife Service. The area east of George Brown Park is a known occupied DSF site where there has been a high density of observations in the past. It served as a control site. The area of interest (test area) was located west of the park.

Field Methods

A total of 14 surveys were conducted on the sites, between August 1 and September 20, 2010 by Gilbert Goodlett (7 survey days) and Brian Drake (7 survey days), both DSF permitted biologists. Two survey hours were spent at the area east of George Brown Park and two survey hours were spent west of the park each field day. At the beginning and end of each field visit, the time (PDT) was noted and weather conditions were recorded. Weather conditions included the shaded air temperature at 1.5 meters high measured with a 0.1°C precision thermister, the ocularly estimated percentage of cloud cover and type of clouds, and wind speeds and direction. Wind speeds were measured with a Kestrel[®] brand electronic wind meter. Measurements were taken until average wind speeds stabilized. The average and maximum wind speeds were recorded. Wind direction was estimated by observing the drift direction of a handful of fine soil that was dropped. These data are listed in Table 1.

The site was walked slowly in generally meandering transects. The times that each site was surveyed was alternated between surveys such that the entire site was covered during all of the survey period during the day. In the area east of George Brown Park, portions of 5 of 14 survey days were spent surveying in a 20.2 acre secondary search area outside of the primary search area in order to determine if DSF occupied that area.

Digital photographs of the site were taken during the survey season by Gilbert Goodlett. Aerial oblique photographs of the site (Appendix 1) were taken by Brian Drake and Gilbert Goodlett on August 16, 2010. Photography locations were selected to fulfill Service protocols (2 site overviews and 3 representative habitat photos) and to most accurately represent the site.

Plant species were noted throughout the survey period. Identification of plants followed The Jepson Manual: Higher Plants of California (Hickman, 1993) and plant communities followed A Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995).

During the field survey, the biologist generally focused on the ground and vegetation in his immediate vicinity in order to increase the likelihood of observing DSF, a low-flying species that is sometimes associated with vegetation. All other species including birds, mammals, reptiles, and invertebrates were recorded. These data were recorded on a digital recorder or scrap paper and transferred to a spreadsheet to log daily species, survey times, and weather data; hence there are no original data sheets so none are attached to this report.

A global positioning system device accurate to 3 m was used to record corners and locations of features on the site. These points and polygons were later downloaded to a laptop computer to create an overlay of the points on a U.S. Geological Survey topographic map. These data were utilized to calculate the areas of features on the site and create an accurate map of the site.

Identification Resources

Bird identification resources included A Field Guide to Western Birds (Peterson, 1993), Field Guide to the Birds of North America (National Geographic Society, 1987), and Stokes Field Guide to Birds: Western Region (Stokes, 1996). Mammal identification resources included California Mammals (Jameson, 1988) and A Field Guide to the Mammals of North America North of Mexico (Burt and Grossenheider, 1980). Reptile identification resources included A Field Guide to Western Reptiles and Amphibians (Stebbins, 1985). Invertebrate identification resources included Insects of the Los Angeles Basin (Hogue, 1993), A Field Guide to Insects: America North of Mexico (Borror and White, 1970), California Insects (Powell and Hogue, 1979), How to Know the Insects (Bland and Jacques, 1978), Simon and Schuster's Guide to Insects (Arnett and Jacques, 1981), National Audubon Society Guide to North American Insects and Spiders (Milne, 1995), The Butterflies of Southern California (Emmel and Emmel, 1973), and California Butterflies (Garth and Tilden, 1986).

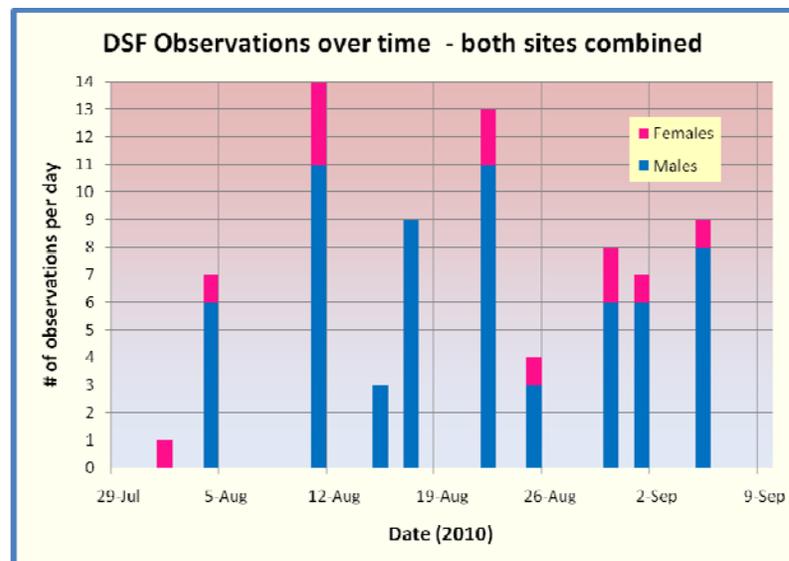
RESULTS

2010 Results

A total of 75 DSF observations were logged during the 14 surveys for the combination of the two sites (east and west of George Brown Park) between August 1 and September 20, 2010 (Table 4a, 4b; figure at right). Sixty-three of these observations were of male DSF and 12 were of female DSF.

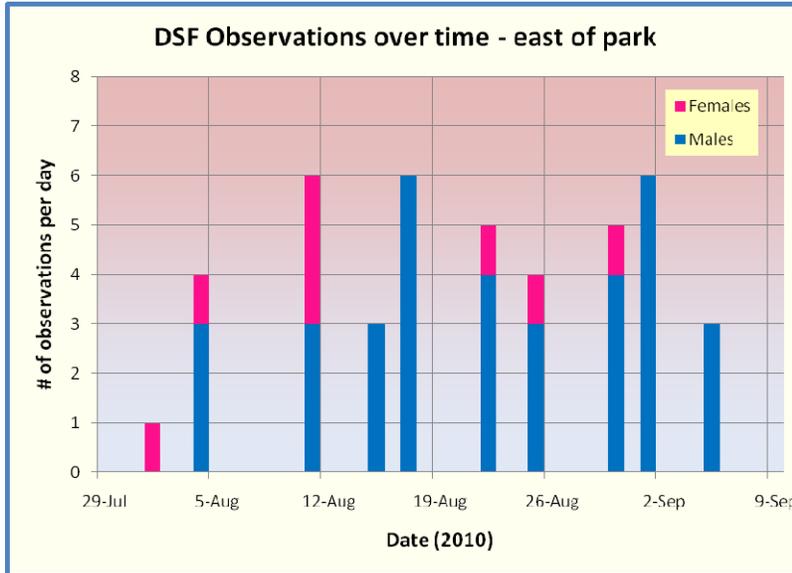
DSF were observed on 10 of the 14 site visits. The first DSF was observed on 1 August, the first day of surveys, when one female DSF was found and the last observation was on 5

September when there were nine observations. The peak daily observation rate of DSF was



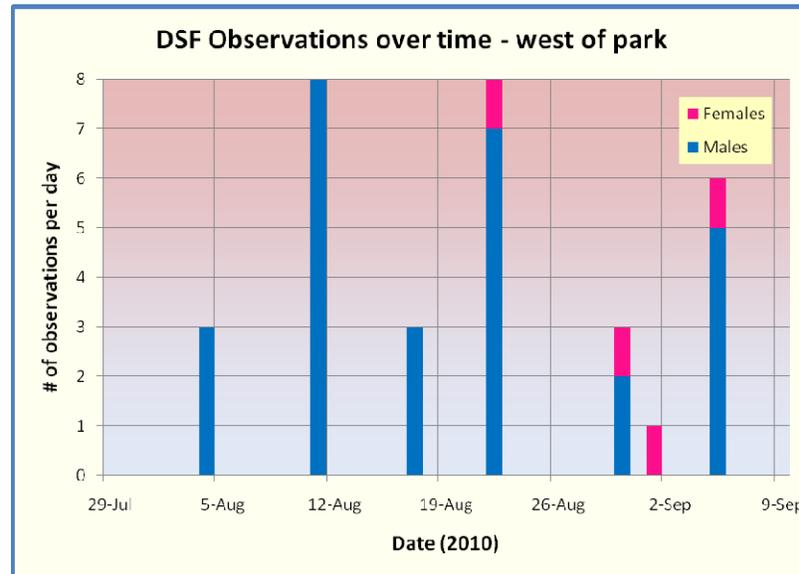
reached on 11 August when fourteen observations were made. Between the first observation and the last, DSF were observed on all but one survey day.

Overall, sex ratios were heavily skewed towards males (63 males: 12 females). This is somewhat typical and is likely an observer bias that results because males are much more mobile and therefore easier to find than females.



At the area east of George Brown Park, 43 DSF observations were made (Table 4a, figure at left). Thirty-five of these were male and eight were females. DSF were observed at this site 10 of the 14 site visits. The peak daily DSF observation rate of six was reached three times during the survey, on 11 August, 17 August, and 1 September. Between the first observation and the last, DSF were observed on all but one survey day.

At the area west of George Brown Park, 32 DSF observations were made (Table 4b, figure at right). Twenty-eight of these were male and four were females. DSF were observed at this site 7 of the 14 site visits, less frequently than the area east of the park. The peak daily DSF observation rate of nine was reached twice during the survey, on 11 August and 17 August (also peak days for the area east of the park). Between the first observation and the last, DSF were observed on all but two survey days.



Contact times for individual DSF varied widely from a minimum of 4 seconds for a flying male to a maximum of 22 minutes 45 seconds for a perched female (table below; Table 4a and 4b). The total contact time with DSF over the course of the survey was almost 2.5 hours. Females accounted for 45% of the observation time even though females were only observed 16% of the time (63:12 male: female). This is because of the female's proclivity to remain perched for much longer periods of time. The mean observation time for DSF was roughly the middle of the survey period at about 8 minutes before noon. On the average, males tended to be observed earlier than females at both sites, and were seen an average of 21 to 28 minutes earlier than females.

DSF CONTACTS	Area East of Park		Area West of Park		All observations
	Males (n=35)	Females (n=8)	Males (n=28)	Females (n=4)	
Total contact duration	0:31:04	0:33:02	0:43:00	0:27:51	2:21:23
Mean contact duration	0:01:02	0:04:08	0:01:52	0:06:58	0:02:11
Mean time at which contacts were initiated	11:43:12	12:11:05	11:54:30	12:15:41	11:52:14
Shortest contact	0:00:04	0:00:24	0:00:10	0:00:26	0:00:04
Longest contact	0:06:43	0:22:45	0:09:39	0:19:26	0:22:45
Earliest contact began at	10:23:00	10:53:23	10:38:00	11:34:36	10:23:00
Latest contact ended at	13:46:16	13:51:45	13:22:39	13:02:30	13:51:45

Even though a majority of the DSF observations (n=43) were at the area east of George Brown Park, these observations represented just under half (47.5%) of the total observation time. Mean contact durations for males and females were similar for both sites and, while the mean time at which contacts were initiated was, on the average, earlier for males than females, this relationship was observed at both sites. Similarly the shortest and longest contacts for each site were similar between the males at each site and between the females at each site. Ending contact times for males and females tended to be later at the area east of the park.

DSF were observed throughout the area east of George Brown Park although the observations tended to be clumped around the margins of the dune area where the vegetative cover began to increase from the relatively unvegetated interior of the dune (Figure 2). DSF were also commonly observed in a secondary search area where portions of 5 of 14 survey days were spent.

West of George Brown Park, DSF observations were clearly heterogeneously distributed. No DSF were observed in the area west of Indigo Avenue, north of Woodpine Avenue, and east of Wildrose Avenue even though, excluding observation time, the same level of search effort was spent here. Further DSF were only observed around the margins of a densely vegetated area abutting the park.

Overall, the most common behavior observed, a typically male behavior, was flying – cruising (Tables 5a, 5b). This was observed in 86.7% of male observations in the area east of George Brown Park and 78.6% of male observations west of the park and none of the females at either site. Females were more often observed flying in a straight line (50% of female observations at each site). Straight line flying was less commonly observed with males (11.4% of male observations at the area east of the park and 3.6% of male observations west of the park).

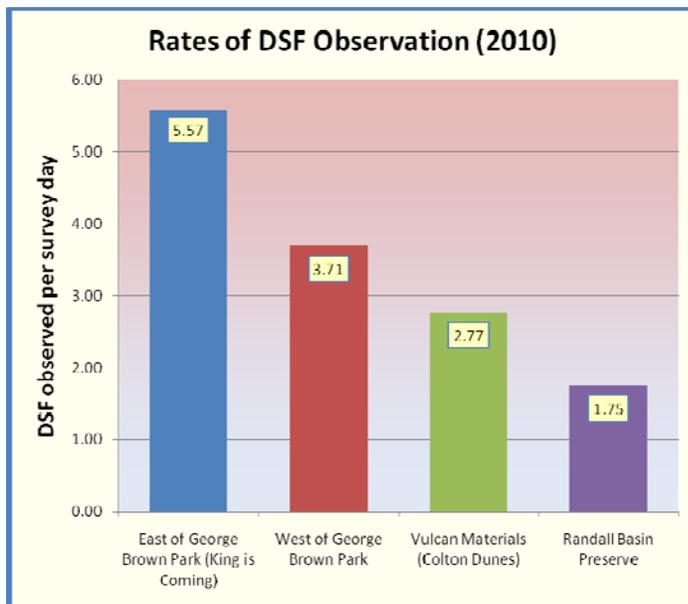
All but one of the females at both sites was observed perched at some point during the observation (behavioral data was not recorded for one female observation). Males were observed

perched much less often (15.4% of male observations at the area east of the park and 9.1% of male observations west of the park). Overall, the most common perch substrates in descending order were California buckwheat (16.0%), telegraph weed (14.7%), sand (9.3%), and unidentified substrate (2.7%). Telegraph weed was the most common perch substrate in the area west of George Brown Park (18.8% of observations at that site) while California buckwheat was the most common perch substrate in the area east of the park (18.6% of observations at that site).

Intra-species interactions were relatively common at both sites (16.3% of observations in the area east of George Brown Park and 28.1% of observations west of the park). In the area east of the park, a male and female were observed mating (Photograph 5) and there were observations of six male DSF involved in antagonistic interactions. In one of these interactions occurring on 22 August, one of the two males involved appeared teneral (recently emerged from pupal case). In the area west of the park, nine males were observed in antagonistic interactions.

Only one inter-species interaction was observed. On 22 August, a male DSF was observed flying in a straight line with an unidentified species following rapidly. This observation occurred in the area east of George Brown Park.

Comparison with Other Occupied Sites Surveyed in 2010



The 2010 survey season was unique in that surveys were conducted at four DSF occupied sites, all within the City of Colton. In addition to the areas discussed in this report, these sites included a 160-acre mitigation bank owned by Vulcan Materials Company known as the Colton Dunes and a small established preserve, Randall Basin located at the northeast corner of Randall and Pepper Avenues that is managed by San Bernardino County.

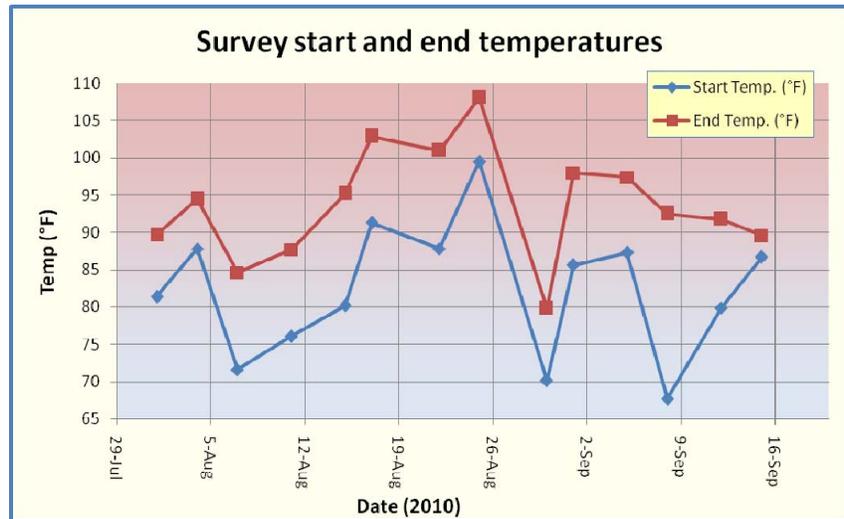
A comparison of these sites yields a sense of the comparative DSF productivity of each site. The area east of George Brown Park had the highest productivity followed by the area west of the park. In considering these data, it should be noted that DSF were found throughout the area east of the park. This was not the case in the area west of the park where there were areas where no DSF were found. Since search effort was expended in these non-productive areas, this likely artificially suppressed the DSF observation rate in the area west of the park.

DSF productivity is not necessarily the same as site importance to the species. Data that is not shown in this figure is that the Vulcan Materials site is about eight times larger than next largest site, is an established conservation easement, and is bounded by additional conservation easements.

Survey Conditions

A total of 56 hours were spent surveying on the site. Survey starting temperatures measured at 1.5 m ranged from 67.7 °F to 99.5 °F with a mean of 82.4 °F (n=14; see figure at right). Ending temperatures ranged from 79.8 °F to 108.1 °F with a mean of 93.8 °F (n=14).

Shaded air temperatures at 1.5 m and on the surface in direct sunlight were taken immediately after most DSF

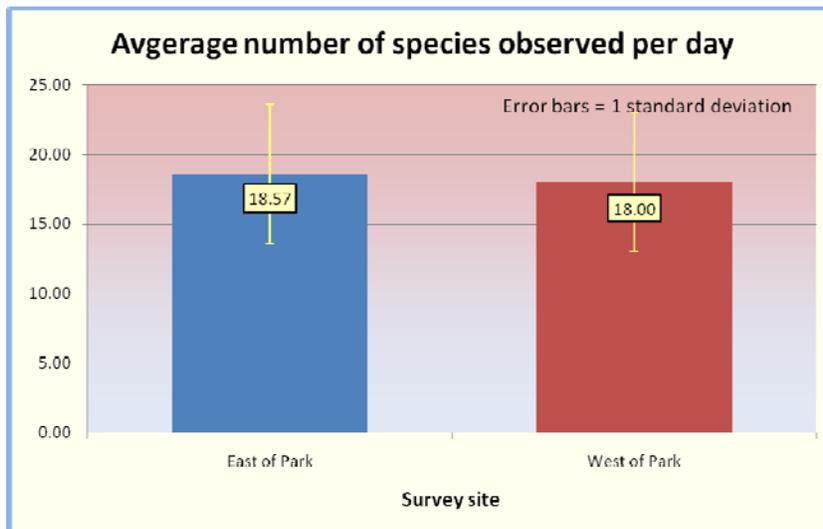


observations at the location where the observation was made (Tables 4a, 4b). For the area east of George Brown park the shaded air 1.5 m temperature ranged from 70.1 °F to 109.1 °F with a mean of 92.7 °F. Surface temperatures on the sand, a substrate that heats rapidly owing to its fine particle size, ranged from 94.3 °F to 151.3 °F with a mean of 122.5 °F.

For the area west of George Brown park the shaded air 1.5 m temperature ranged from 75.9 °F to 109.1 °F with a mean of 92.8 °F. Surface temperatures on the sand ranged from 104.0 °F to 141.1 °F with a mean of 126.1 °F.

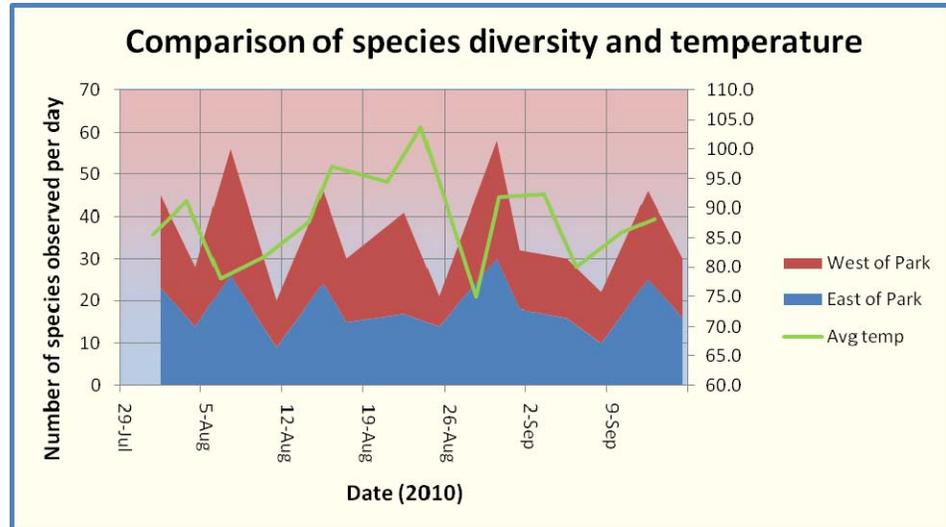
Winds generally blew from the south through the west at the start of the survey and from the west at the end of the survey (Table 1). It was generally windier at the end of surveys (mean average wind = 5.2 mph) than the beginning of surveys (mean average wind = 1.8 mph). The peak wind condition measured was 9.1 mph at the end of the survey on 5 September.

Species Other Than DSF



There was no significant difference observed between the two sites and the average number of all species (invertebrates, birds, mammals, reptiles) observed (figure at left). Although the average daily species count was slightly higher at the area east of George Brown Park, this difference was not found to be statistically significant.

It was generally noted that if species counts were high at one of the sites, they tended to be high at the other site. In the figure at right, the width of the bands indicates the species count for each site. It is notable that on a day such as 30 August, both of the sites show peaks indicating high



species counts. The converse also tended to be true. On 8 September, both of the sites show a valley indicating low species counts. Further there appeared to be a loose relationship between average survey temperature and the number of species observed. On low temperature days such as 7 August and 30 August, species counts tended to be higher. On high temperature days such as 25 August, the species counts tended to be lower.

A total of 61 species of invertebrates were detected on the combination of the two sites. Five additional invertebrates that were identified to family only were also seen. Sixteen species of birds (one identified to family only), four species of mammals and three species of reptiles were observed. These are listed phylogenetically in Tables 3a and 3b along with their dates of observation.

Other Results

Fifteen species of plants were identified on the site (Table 2). These were incidental observations during the survey and not intended as an exhaustive compendium.

Six annotated photographs of the site are included in Appendix 1. Appendix 2 is a Service-required field form for use by the California Fish and Game Department to enter biological observations into the California Natural Diversity Data Base.

CONCLUSIONS

DSF were found in abundance at both the site east of George Brown Park and the site west of the park. DSF were found distributed throughout the area east of the park but only in part of the area west of the park. DSF were not found in the area west of the park that is west of Indigo Avenue which represented over half of the search area. Differences noted in this area west of Indigo Avenue as compared to the area east of Indigo Avenue included the following:

- Overall, soils were more consolidated even though there were areas of unconsolidated soils.
- Except in very localized areas, the density of California buckwheat was lower.
- The density of telegraph weed and California croton was lower.

There were 43 DSF observations in the area east of the park and 32 observations west of the park. Since, roughly half of the survey effort in the area west of the park was spent in the non-productive area west of Indigo Avenue; it is conceivable, that the DSF count in this area could have been as or higher than the area east of the park if the survey had been focused only in the productive area.

There were no significant differences found in the count of species other than DSF at each site. This suggests that there are no substantial habitat differences between the two sites that would preclude other species from utilizing that habitat.

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TABLES

Table 1. Survey Times and Weather Data

Date (2010)	Biologist	Start time	End time	Start Temp. (°F)	End Temp. (°F)	Start Cloud Cover (%)	End Cloud Cover (%)	Start Average Wind Speed (mph)	End Average Wind Speed (mph)	Start Maximum Wind Speed (mph)	End Maximum Wind Speed (mph)	Start Wind Direction	End Wind Direction
1-Aug	Gilbert Goodlett	10:00	14:00	81.4	89.7	30% thin cirrus	25% thin cirrus	2.6	3.2	4.0	6.3	S	W
4-Aug	Brian Drake	10:00	14:00	87.8	94.5	0%	0%	2.7	4.2	4.4	5.8	SW	SW
7-Aug	Gilbert Goodlett	10:00	14:00	71.6	84.6	100% haze	0%	2.9	5.3	5.1	7.6	W	W
11-Aug	Brian Drake	10:00	14:00	76.1	87.7	0%	0%	2.2	2.0	4.2	2.4	NW	SW
15-Aug	Gilbert Goodlett	10:00	14:00	80.2	95.2	10% cirrus	5% thin cirrus	2.8	3.7	4.2	6.4	S	W
17-Aug	Brian Drake	10:00	14:00	91.3	102.9	10%	20%	0.0	3.3	0.0	4.0		SW
22-Aug	Gilbert Goodlett	10:00	14:00	87.8	101.0	2% cirrus	5% cirrus	2.1	2.5	3.5	3.8	VAR	VAR
25-Aug	Brian Drake	10:00	14:00	99.5	108.1	10%	40%	0.0	2.1	0.0	2.6		W
30-Aug	Gilbert Goodlett	10:00	14:00	70.1	79.8	50% cumulus	0%	0.0	2.9	0.0	4.6		W
1-Sep	Brian Drake	10:00	14:00	85.6	98.0	0%	0%	1.8	1.5	2.0	3.1	SW	SW
5-Sep	Gilbert Goodlett	10:00	14:00	87.3	97.4	0%	0%	2.1	5.6	3.8	9.1	S	W
8-Sep	Brian Drake	10:00	14:00	67.7	92.5	100%	100%	4.1	2.4	4.6	3.4	W	W
12-Sep	Gilbert Goodlett	10:00	14:00	79.9	91.8	1% cumulus	2% cumulus	2.3	6.0	3.1	8.8	S	W
15-Sep	Brian Drake	10:00	14:00	86.7	89.6	0%	20%	0.0	3.2	0.0	4.4		SW

Table 2. List of Plants Observed During 2010 Survey Season Listed Phylogenetically by Order, Family, and Scientific Name

Scientific Name	Common Name	Non-native
ORDER: DICOTYLEDON	DICOTS	
Amaranthaceae	Amaranth Family	
<i>Amaranthus albus</i>	Tumbleweed	*
Asteraceae	Sunflower Family	
<i>Ambrosia acanthicarpa</i>	Bur-Sage	
<i>Heterotheca grandiflora</i>	Telegraph Weed	
Boraginaceae	Borage Family	
<i>Amsinckia sp.</i>	Fiddleneck	
Brassicaceae	Mustard Family	
<i>Brassica sp.</i>	Mustard	*
<i>Hirschfeldia incana</i>	Shortpod Mustard	*
Euphorbiaceae	Spurge Family	
<i>Croton californicus</i>	California Croton	
Fabaceae	Legume Family	
<i>Lotus purshianus</i>	Lotus	
Geraniaceae	Geranium Family	
<i>Erodium cicutarium</i>	Redstem Filaree	*
Polygonaceae	Buckwheat Family	
<i>Eriogonum fasciculatum</i>	California Buckwheat	
Rosaceae	Rose Family	
<i>Prunus ilicifolia</i>	Cherry	
Zygophyllaceae	Caltrop Family	
<i>Tribulus terrestris</i>	Puncture Vine	*
ORDER: MONOCOTYLEDON	Monocots	
Poaceae	Grass Family	
<i>Avena sp.</i>	Wild oat	*
<i>Bromus diandrus</i>	Ripgut Grass	*
<i>Schismus sp.</i>	Mediterranean Grass	*

Table 3a. List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area east of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
INVERTEBRATES															
ORDER: ODONATA	DRAGONFLIES AND DAMSELFLIES	X	X	X	X	X	X			X	X		X	X	X
Aeshnidae	Darners	X		X										X	X
<i>Anax junius</i>	Common Green Darner	X		X										X	
Libellulidae	Common Skimmers	X		X		X				X				X	
<i>Libellula saturata</i>	Big Red Skimmer	X				X				X					
<i>Pachydiplax longipennis</i>	Blue Dasher			X											
<i>Tramea lacerata</i>	Black Saddlebags			X											
ORDER: ORTHOPTERA	GRASSHOPPERS, KATYDIDS & CRICKETS	X	X	X	X	X	X	X	X		X	X		X	X
Acrididae	Short-horned Grasshoppers	X	X	X	X	X	X	X	X		X	X		X	X
<i>Trimerotropis pallidipennis</i>	Pallid Band-winged Grasshopper	X		X				X				X			
<i>Trimerotropis sp.</i>	Short-horned Grasshopper		X		X	X	X		X		X			X	
Subfamily: Gryllinae	House and Field Crickets														X
ORDER: HEMIPTERA	TRUE BUGS		X								X				X
Pentatomidae	Stink Bugs		X								X				X
<i>Chlorochroa sayi</i>	Say's Stink Bug		X								X				X
ORDER: NEUROPTERA	NERVE-WINGED INSECTS							X	X	X	X	X		X	X
Myrmeleontidae	Antlions							X	X	X	X	X		X	X
<i>Brachynemerus sp.</i>	Antlion							X	X	X	X	X		X	X
ORDER: LEPIDOPTERA	MOTHS AND BUTTERFLIES	X	X	X		X	X	X	X	X	X	X	X	X	
Noctuidae	Millers and Cutworms							X							
<i>Helicoverpa zea</i>	Corn Earworm							X							
Hesperiidae	Skippers	X	X	X		X				X	X		X		
<i>Atalopedes campestris</i>	Field Skipper		X								X		X		
<i>Hylephila phyleus</i>	Fiery Skipper	X		X		X				X					
Lycaenidae	Blues	X		X		X	X	X	X	X	X	X		X	
<i>Brephidium exilis</i>	Pigmy Blue			X		X		X	X	X	X	X		X	
<i>Icaricia acmon</i>	Acmon Blue						X	X							
<i>Leptotes marina</i>	Marine Blue			X						X					
<i>Strymon melinus</i>	Common Hairstreak	X						X		X					
Nymphalidae	Brush-footed Butterflies								X	X	X			X	
<i>Precis coenia</i>	Buckeye								X		X				
<i>Vanessa cardui</i>	Painted Lady									X					
<i>Vanessa sp.</i>	Unidentified Lady													X	
Pieridae	Whites and Sulfurs	X		X		X				X				X	
<i>Colias eurytheme</i>	Alfalfa Sulphur									X				X	
<i>Pieris protodice</i>	Common White	X		X		X				X				X	

Table 3a (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area east of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
ORDER: COLEOPTERA	BEETLES	X	X	X		X				X	X	X		X	
Buprestidae	Metallic Wood-boring Beetles											X		X	
Scarabaeidae	Scarab Beetles	X	X	X		X				X	X				
<i>Cotinus mutabilis</i>	Green Fruit Beetle	X	X	X		X				X	X				
ORDER: DIPTERA	FLIES	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Apioceridae	Flower-loving Flies									X	X	X			X
<i>Apiocera sp.</i>	Flower Fly									X	X	X			X
Mydidae	Mydas Flies	X	X		X	X	X	X	X	X	X	X			
<i>Nemomydas pantherinus</i>	Mydas Fly	X													
<i>Rhaphiomidas terminatus abdominalis</i>	Delhi Sands Flower-loving fly	X	X		X	X	X	X	X	X	X	X			
Bombyliidae	Bee Flies	X		X	X	X	X	X		X	X	X	X	X	X
<i>Exoprosopa sp.</i>	Bee Fly							X						X	
<i>Poecilanthrax sp.</i>	Bee Fly			X		X		X		X	X	X		X	X
<i>Toxophora sp.</i>	Bee Fly									X		X		X	
<i>Villa sp.</i>	Bee Fly	X			X	X	X				X		X		X
<i>Xenox sp.</i>	Bee Fly									X					
Tachinidae	Tachinid Flies			X											
<i>Gymnosoma fuliginosum</i>	Tachnid Fly			X											
ORDER: HYMENOPTERA	SAWFLIES, ICHNEUMONS, CHALCIDS, ANTS, WASPS, AND BEES	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Tiphiidae	Tiphiid Wasps					X									
Scoliidae	Scoliid Wasps	X		X		X				X					X
<i>Campsomeris tolteca</i>	Scoliid Wasp	X		X		X				X					X
Mutillidae	Velvet Ants												X		
<i>Dasymutilla sp.</i>	Velvet Ant												X		
Formicidae	Ants	X	X	X		X				X	X		X	X	
<i>Iridomyrmex humilis</i>	Argentine Ant			X						X				X	
<i>Pogonomyrmex californicus</i>	California Harvester Ant	X		X		X				X				X	
Pompilidae	Spider Wasps				X		X		X						X
Vespidae	Vespid Wasps	X	X	X		X	X	X		X		X	X	X	X
<i>Polistes apachus</i>	Paper Wasp	X		X											
<i>Polistes exclamans</i>	Paper Wasp									X		X		X	
<i>Polistes sp.</i>	Paper Wasp	X	X	X		X	X	X		X			X		X

Table 3a (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area east of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
Sphecidae	Sphecid Wasps	X	X	X	X	X	X	X	X	X	X	X		X	
<i>Ammophila azteca</i>	Thread-waisted Wasp			X								X			
<i>Bembix americana</i>	Sand Wasp	X													
<i>Bembix comata</i>	Western Sand Wasp	X	X	X	X	X	X	X	X	X	X	X		X	
<i>Cerceris</i> sp.	Sphecid Wasp	X						X				X		X	
<i>Chlorion aerarium</i>	Steel Blue Cricket Hunter	X													
<i>Philanthus multimaculatus</i>	Sphecid Wasp	X													
<i>Philanthus</i> sp.	Sphecid Wasp					X		X						X	
<i>Prionyx foxi</i>	Sphecid Wasp		X												
<i>Sceliphron caementarium</i>	Mud Dauber													X	
Megachilidae	Leafcutting Bees													X	
<i>Megachile</i> sp.	Common Leaf-cutter													X	
Apidae	Honey Bees and Bumble Bees	X	X	X		X	X	X	X	X		X	X	X	X
<i>Apis mellifera</i>	Honey Bee	X	X	X		X	X	X	X	X		X	X	X	X
ORDER: ARANEAE	SPIDERS	X		X		X		X		X		X		X	
Agelinidae	Funnel Web Spiders	X		X		X		X		X		X		X	
BIRDS															
ORDER: FALCONIFORMES	HAWKS AND VULTURES					X				X	X			X	
Cathartidae	American Vultures									X					
<i>Cathartes aura</i>	Turkey Vulture									X					
Accipitridae	Hawks					X				X	X			X	
<i>Buteo jamaicensis</i>	Red-tailed Hawk									X	X			X	
ORDER: CHARADRIIFORMES	GULLS AND SHOREBIRDS					X									
Charadriidae	Plovers					X									
<i>Charadrius vociferus</i>	Killdeer					X									
ORDER: COLUMBIFORMES	DOVES AND PIGEONS	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Columbidae	Pigeons and Doves	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Columba livia</i>	Rock Dove			X		X	X	X		X	X	X	X	X	X
<i>Streptopelia chinensis</i>	Spotted Dove										X				
<i>Zenaida macroura</i>	Mourning Dove	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ORDER: APODIFORMES	HUMMINGBIRDS AND SWIFTS													X	
Trochidae	Hummingbirds													X	
ORDER: PASSERIIFORMES	PASSERINES AND PERCHING BIRDS	X	X	X	X	X	X		X	X	X		X	X	X
Tyrannidae	Flycatchers					X			X	X			X		X
<i>Sayornis saya</i>	Say's Phoebe								X				X		
<i>Tyrannus verticalis</i>	Western Kingbird					X				X					X
Corvidae	Jays, Magpies, and Crows		X		X	X	X		X	X					
<i>Corvus brachyrhynchos</i>	American Crow		X		X	X	X		X	X					
Mimidae	Mimic Thrashers	X	X	X	X	X	X		X	X			X	X	X
<i>Mimus polyglottos</i>	Northern Mockingbird	X	X	X	X	X	X		X	X			X	X	X
Sturnidae	Starlings		X		X						X				
<i>Sturnus vulgaris</i>	European Starling		X		X						X				

Table 3a (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area east of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
Fringillidae	Finches						X						X		
<i>Carpodacus mexicanus</i>	House Finch						X						X		
Passeridae	Weaver Finches								X						X
<i>Passer domesticus</i>	House Sparrow								X						X
MAMMALS															
ORDER: CARNIVORA	FLESH-EATERS			X	X	X								X	
Canidae	Dogs, wolves, and foxes			X	X	X								X	
<i>Canis latrans</i>	Coyote			X	X	X								X	
ORDER: RODENTIA	GNAWING MAMMALS	X		X		X	X		X			X		X	X
Sciuridae	Squirrels	X		X		X			X			X		X	X
<i>Spermophilus beecheyi</i>	California Ground Squirrel	X		X		X			X			X		X	X
Geomyidae	Pocket Gophers						X								
<i>Thomomys bottae</i>	Botta's Pocket Gopher						X								
ORDER: LAGOMORPHA	PIKAS, HARES, AND RABBITS			X											
Leporidae	Hares and Rabbits			X											
<i>Sylvilagus auduboni</i>	Audubon's Cottontail			X											
REPTILES															
ORDER: SQUAMATA	LIZARDS AND SNAKES	X	X	X		X	X	X	X	X	X	X		X	X
Iguanidae	Iguanids	X	X	X		X	X	X	X	X	X	X		X	X
<i>Sceloporus occidentalis</i>	Western Fence Lizard						X								
<i>Uta stansburiana</i>	Side-blotched Lizard	X	X	X		X	X	X	X	X	X	X		X	X

Table 3b. List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area west of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
INVERTEBRATES															
ORDER: ODONATA	DRAGONFLIES AND DAMSELFLIES	X		X	X	X		X		X		X	X	X	X
Aeshnidae	Darners			X						X		X		X	
<i>Anax junius</i>	Common Green Darner			X						X		X		X	
Libellulidae	Common Skimmers	X		X		X		X		X		X		X	
<i>Libellula saturata</i>	Big Red Skimmer			X		X		X		X					
<i>Pachydiplax longipennis</i>	Blue Dasher									X					
<i>Perithemis intensa</i>	Mexican Amberwing			X											
<i>Tramea lacerata</i>	Black Saddlebags									X					
ORDER: ORTHOPTERA	GRASSHOPPERS, KATYDIDS & CRICKETS	X	X	X	X	X		X	X	X	X	X		X	X
Acrididae	Short-horned Grasshoppers	X	X	X	X	X		X	X	X	X	X		X	X
<i>Schistocerca nitens</i>	Gray Bird Grasshopper							X							
<i>Trimerotropis pallidipennis</i>	Pallid Band-winged Grasshopper	X		X								X		X	
<i>Trimerotropis sp.</i>	Short-horned Grasshopper		X		X	X		X	X	X	X				X
ORDER: HEMIPTERA	TRUE BUGS			X						X				X	
Pentatomidae	Stink Bugs			X						X				X	
<i>Chlorochroa sayi</i>	Say's Stink Bug									X				X	
<i>Chlorochroa sp.</i>	Stink Bug			X											
ORDER: NEUROPTERA	NERVE-WINGED INSECTS	X	X	X		X		X		X	X	X		X	
Myrmeleontidae	Antlions	X	X	X		X		X		X	X	X		X	
<i>Brachynemerus sp.</i>	Antlion	X	X	X		X		X		X	X	X		X	
ORDER: LEPIDOPTERA	MOTHS AND BUTTERFLIES	X	X	X	X	X	X	X	X	X	X	X			X
Pyralidae	Pyralid Moths													X	
Noctuidae	Millers and Cutworms													X	
<i>Helicoverpa zea</i>	Corn Earworm													X	
Hesperiidae	Skippers	X	X	X	X	X	X			X		X			X
<i>Atalopedes campestris</i>	Field Skipper		X		X	X	X								X
<i>Hylephila phyleus</i>	Fiery Skipper	X		X		X				X		X			
Lycaenidae	Blues		X	X		X		X			X			X	
<i>Brephidium exilis</i>	Pigmy Blue					X		X						X	
<i>Icaricia acmon</i>	Acmon Blue		X								X				
<i>Leptotes marina</i>	Marine Blue			X											
<i>Strymon melinus</i>	Common Hairstreak					X								X	
Nymphalidae	Brush-footed Butterflies									X		X		X	
<i>Limenitis lorquini</i>	Mourning Cloak											X			
<i>Precis coenia</i>	Buckeye									X				X	
<i>Vanessa cardui</i>	Painted Lady									X					

Table 3b (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area west of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
Pieridae	Whites and Sulphurs	X	X	X		X	X	X	X	X	X				X
<i>Colias eurytheme</i>	Alfalfa Sulphur								X	X					
<i>Pieris protodice</i>	Common White	X	X	X		X	X	X		X	X				X
Papilionidae	Swallowtails and Parnassians							X						X	
<i>Papilio rutulus</i>	Western Tiger Swallowtail							X						X	
ORDER: COLEOPTERA	BEETLES			X			X								
Rhipiphoridae	Wedge-shaped Beetles	X													
<i>Macrosiagon flavipenne</i>	Wedge-shaped Beetle	X													
Scarabaeidae	Scarab Beetles			X			X								
<i>Cotinus mutabilis</i>	Green Fruit Beetle			X			X								
ORDER: DIPTERA	FLIES	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Apioceridae	Flower-loving Flies			X							X		X		
<i>Apiocera sp.</i>	Flower Fly			X							X		X		
Asilidae	Robber Flies	X					X		X						
<i>Mallophora fauatrix</i>	Bumble bee robber fly	X					X								
Mydidae	Mydas Flies		X		X		X	X	X	X		X			
<i>Rhaphiomidas terminatus abdominalis</i>	Delhi Sands Flower-loving fly		X		X		X	X	X	X		X			
Bombyliidae	Bee Flies	X		X		X	X	X	X	X	X	X		X	X
<i>Exoprosopa sp.</i>	Bee Fly	X						X				X		X	
<i>Poecilanthrax sp.</i>	Bee Fly					X		X	X						
<i>Toxophora sp.</i>	Bee Fly	X				X				X					
<i>Villa sp.</i>	Bee Fly	X							X	X	X				X
<i>Xenox sp.</i>	Bee Fly			X		X	X	X						X	X
Muscidae	Muscid Flies							X							
<i>Musca domestica</i>	House Fly							X							
Tachinidae	Tachinid Flies			X											
ORDER: HYMENOPTERA	SAWFLIES, ICHNEUMONS, CHALCIDS, ANTS, WASPS, AND BEES	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Scoliidae	Scoliid Wasps	X		X	X	X	X	X		X				X	
<i>Campsomeris tolteca</i>	Scoliid Wasp	X		X	X	X	X	X		X				X	
Formicidae	Ants	X	X	X	X	X		X	X			X	X	X	X
<i>Iridomyrmex humilis</i>	Argentine Ant	X		X						X					
<i>Pogonomyrmex californicus</i>	California Harvester Ant	X		X		X		X		X		X		X	
Pompilidae	Spider Wasps				X			X			X				X
Vespidae	Vespid Wasps	X	X	X		X	X	X		X	X	X		X	X
<i>Polistes apachus</i>	Paper Wasp	X		X											
<i>Polistes exclamans</i>	Paper Wasp			X				X						X	
<i>Polistes fuscatus</i>	Golden Polistes					X									
<i>Polistes sp.</i>	Paper Wasp		X			X	X			X	X	X			X

Table 3b (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area west of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
Sphecidae	Sphecid Wasps	X		X	X	X	X	X	X	X	X	X		X	
<i>Bembix comata</i>	Western Sand Wasp	X		X	X	X	X	X	X	X	X	X		X	X
<i>Chlorion aerarium</i>	Steel Blue Cricket Hunter		X	X						X					
<i>Microbembix californica</i>	Sphecid Wasp	X													
<i>Philanthus multimaculatus</i>	Sphecid Wasp									X					
<i>Philanthus sp.</i>	Sphecid Wasp					X				X					
<i>Philanthus ventalibris</i>	Sphecid Wasp	X													
<i>Prionyx foxi</i>	Sphecid Wasp									X					
<i>Sceliphron caementarium</i>	Mud Dauber			X				X		X	X	X			X
Megachilidae	Leafcutting Bees													X	
<i>Megachile sp.</i>	Common Leaf-cutter													X	
Anthophoridae	Carpenter Bees							X							
<i>Xylocopa varipuncta</i>	Valley Carpenter Bee							X							
Apidae	Honey Bees and Bumble Bees	X	X	X	X	X	X	X		X	X	X	X	X	X
<i>Apis mellifera</i>	Honey Bee	X	X	X	X	X	X	X		X	X	X	X	X	X
ORDER: ARANEAE	SPIDERS	X		X		X		X		X		X		X	
Agelinidae	Funnel Web Spiders	X		X		X		X		X		X		X	
BIRDS															
ORDER: FALCONIFORMES	HAWKS AND VULTURES			X				X							
Accipitridae	Hawks			X				X							
<i>Accipiter cooperii</i>	Cooper's Hawk			X											
<i>Buteo jamaicensis</i>	Red-tailed Hawk							X							
ORDER: CHARADRIIFORMES	GULLS AND SHOREBIRDS			X									X		
Charadriidae	Plovers			X									X		
<i>Charadrius vociferus</i>	Killdeer			X									X		
ORDER: COLUMBIFORMES	DOVES AND PIGEONS	X	X	X	X	X	X	X		X	X	X	X	X	X
Columbidae	Pigeons and Doves	X	X	X	X	X	X	X		X	X	X	X	X	X
<i>Columba livia</i>	Rock Dove	X	X	X		X	X	X		X	X		X	X	X
<i>Streptopelia chinensis</i>	Spotted Dove												X		
<i>Zenaida macroura</i>	Mourning Dove	X	X		X	X	X	X		X	X	X	X	X	X
ORDER: STRIGIFORMES	OWLS			X											
Strigidae	Typical Owls			X											
<i>Athene cunicularia</i>	Burrowing Owl			X											
ORDER: APODIFORMES	HUMMINGBIRDS AND SWIFTS			X									X		
Trochidae	Hummingbirds			X									X		
ORDER: PASSERIIFORMES	PASSERINES AND PERCHING BIRDS		X	X	X		X					X	X	X	X
Tyranidae	Flycatchers				X								X	X	
<i>Sayornis nigricans</i>	Black Phoebe												X		
<i>Tyrannus verticalis</i>	Western Kingbird				X									X	
Corvidae	Jays, Magpies, and Crows											X			
<i>Corvus brachyrhynchos</i>	American Crow											X			

Table 3b (cont). List of Invertebrates, Birds, Mammals, and Reptiles Observed at the area west of George Brown Park During 2010 Survey Season Listed Phylogenetically

Scientific Name	Common Name	8/1	8/4	8/7	8/11	8/15	8/17	8/22	8/25	8/30	9/1	9/5	9/8	9/12	9/15
Mimidae	Mimic Thrashers			X									X	X	
<i>Mimus polyglottos</i>	Northern Mockingbird			X									X	X	
Sturnidae	Starlings						X								
<i>Sturnus vulgaris</i>	European Starling						X								
Fringillidae	Finches		X		X		X						X		X
<i>Carpodacus mexicanus</i>	House Finch		X		X		X						X		X
Passeridae	Weaver Finches														X
<i>Passer domesticus</i>	House Sparrow														X
MAMMALS															
ORDER: CARNIVORA	FLESH-EATERS			X					X						X
Canidae	Dogs, wolves, and foxes			X					X						X
<i>Canis latrans</i>	Coyote			X					X						X
ORDER: RODENTIA	GNAWING MAMMALS			X	X	X		X							
Sciuridae	Squirrels			X	X	X		X							
<i>Spermophilus beecheyi</i>	California Ground Squirrel			X	X	X		X							
ORDER: LAGOMORPHA	PIKAS, HARES, AND RABBITS	X		X		X					X		X		
Leporidae	Hares and Rabbits	X		X		X					X		X		
<i>Sylvilagus auduboni</i>	Audubon's Cottontail	X		X		X					X		X		
REPTILES															
ORDER: SQUAMATA	LIZARDS AND SNAKES	X	X	X	X	X	X	X		X	X	X	X	X	X
Iguanidae	Iguanids	X	X	X	X	X	X	X		X	X	X	X	X	
<i>Sceloporus occidentalis</i>	Western Fence Lizard												X		
<i>Uta stansburiana</i>	Side-blotched Lizard	X	X	X	X	X	X	X		X	X	X	X	X	
Teiidae	Whiptails	X	X	X											
<i>Aspidoscelis tigris</i>	Western Whiptail	X	X	X											

Table 4a. Observation times, location notes, behavior, and weather conditions for 43 DSF observations at the area east of George Brown Park

Date (2010)	Start time	End time	Total contact time	Sex	Coordinates of initial observation (UTM, NAD-83, Grid 11) Easting	Coordinates of initial observation (UTM, NAD-83, Grid 11) Northing	Behavior ^{1,2}	Air temp (F) ³	Sfc temp (F) ⁴	Wind avg (mph)	Wind max (mph)	Direction
1-Aug	12:30:00	12:52:45	0:22:45	F	04 67 131	37 70 753	Perched on HETGRA, periodically flew to various HETGRA and ERIFAS in 5 m radius	85.4	NR	NR	NR	NR
4-Aug	11:34:00	11:35:00	0:01:00	F	04 67 290	37 70 675	NR	NR	NR	NR	NR	NR
4-Aug	11:33:00	11:33:30	0:00:30	M	04 67 273	37 70 662	Flying-cruising	87.8	NR	2.7	4.4	SW
4-Aug	11:36:00	11:36:10	0:00:10	M	04 67 292	37 70 684	Flying-cruising	NR	NR	NR	NR	NR
4-Aug	11:47:00	11:47:30	0:00:30	M	04 67 303	37 70 732	Flying-cruising	91.4	NR	2.4	3.0	SW
11-Aug	12:42:00	12:45:00	0:03:00	F	04 67 264	37 70 667	Perched on ERIFAS	NR	NR	NR	NR	NR
11-Aug	12:45:00	12:47:00	0:02:00	F	04 67 198	37 70 688	Perched on HETGRA	NR	NR	NR	NR	NR
11-Aug	12:22:00	12:22:30	0:00:30	M	04 67 303	37 70 711	Flying-cruising	NR	NR	NR	NR	NR
11-Aug	13:09:00	13:09:30	0:00:30	M	04 67 304	37 70 602	Flying-cruising	87.7	NR	2.0	2.4	NW
11-Aug	12:18:00	12:19:00	0:01:00	M&F	04 67 286	37 70 663	Male flew to mate with female that was perched on ERIFAS	78.9	NR	2.3	2.8	NW
15-Aug	11:26:06	11:28:41	0:02:35	M	04 67 142	37 70 766	Perched on ERIFAS briefly then flying-cruising at low altitude	88.2	132.3	1.9	3.2	S
15-Aug	11:32:48	11:34:09	0:01:21	M	04 67 145	37 70 762	Flying-cruising - likely same individual as previous obs	88.2	132.3	1.9	3.2	S
15-Aug	11:47:45	11:54:28	0:06:43	M	04 67 191	37 70 690	Flying-cruising over a large 100 m radius area - never perched	93.1	132.1	2.3	2.8	SW
17-Aug	11:15:00	11:16:30	0:01:30	2 M	04 67 050	37 70 384	2 males randomly flying-cruising through HETGRA	100.4	105.3	0.0	0.0	
17-Aug	10:26:00	10:26:30	0:00:30	M	04 67 312	37 70 748	Flying-cruising SW	95.5	104.0	2.3	3.2	SW
17-Aug	10:42:00	10:42:10	0:00:10	M	04 67 332	37 70 598	Flying-cruising N	101.4	108.6	2.3	3.2	SW
17-Aug	10:59:00	10:59:10	0:00:10	M	04 67 182	37 70 537	Flying-cruising NE	99.3	109.1	2.1	3.9	S
17-Aug	11:35:00	11:37:00	0:02:00	M	04 67 045	37 70 330	Generally flying-cruising NW - twice landed on HETGRA	100.9	109.5	1.1	1.6	NW
22-Aug	13:22:17	13:24:54	0:02:37	2M	04 67 225	37 70 669	Flew from one HETGRA and ERIFAS perch to another - appeared teneral - brief interaction with another male	98.6	144.9	3.4	5.6	SW
22-Aug	13:51:21	13:51:45	0:00:24	F	04 67 162	37 70 656	Flying from perch to perch on ERIFAS	101.0	148.3	2.5	3.8	VAR
22-Aug	13:30:25	13:30:29	0:00:04	M	04 67 249	37 70 666	Flying in a near straight line to SE with another species flying behind it	98.6	144.9	3.4	5.6	SW
22-Aug	13:45:26	13:46:16	0:00:50	M	04 67 124	37 70 716	Flying-cruising - perched briefly on 1 HETGRA and 1 ERIFAS	99.5	151.3	3.5	6.1	W

Table 4a (cont). Observation times, location notes, behavior, and weather conditions for 43 DSF observations at the area east of George Brown Park

Date (2010)	Start time	End time	Total contact time	Sex	Coordinates of initial observation (UTM, NAD-83, Grid 11) Easting	Coordinates of initial observation (UTM, NAD-83, Grid 11) Northing	Behavior ^{1,2}	Air temp (F) ³	Sfc temp (F) ⁴	Wind avg (mph)	Wind max (mph)	Direction
25-Aug	10:55:00	10:57:00	0:02:00	F	04 67 285	37 70 670	Perched on ERIFAS - broke contact to continue surveys	105.6	114.1	0.0	0.0	
25-Aug	10:35:00	10:35:30	0:00:30	M	04 67 335	37 70 726	Flying-cruising HETGRA	104.1	107.7	0.0	0.0	
25-Aug	11:01:00	11:01:30	0:00:30	M	04 67 276	37 70 715	Flying-cruising ERIFAS	108.6	115.1	0.0	0.0	
25-Aug	11:07:00	11:07:10	0:00:10	M	04 67 245	37 70 683	In biologist's face	107.1	111.6	0.0	0.0	
30-Aug	10:53:23	10:54:16	0:00:53	F	04 67 158	37 70 752	Perched on sand then flew straight line to NW	83.3	105.4	0.0	0.0	
30-Aug	10:47:25	10:47:40	0:00:15	M	04 67 168	37 70 768	Flew straight at low altitude to the SW	70.1	115.5	1.5	2.9	VAR
30-Aug	11:28:35	11:29:30	0:00:55	M	04 67 182	37 70 679	Flying-cruising	71.1	118.9	2.7	3.4	W
30-Aug	11:30:45	11:33:46	0:03:01	M	04 67 202	37 70 685	Flying-cruising, perched 3 times on sand for a few seconds	71.1	118.9	2.7	3.4	W
30-Aug	12:03:02	12:03:24	0:00:22	M	04 67 133	37 70 629	Resting on sand then flew away in unknown direction	77.8	116.2	1.9	3.2	S
1-Sep	10:23:00	10:23:10	0:00:10	2M	04 67 352	37 70 721	2 males fighting	90.2	94.3	0.0	0.0	
1-Sep	11:14:00	11:14:10	0:00:10	2M	04 67 069	37 70 800	2 males fighting	94.4	99.5	1.6	2.5	SW
1-Sep	10:43:00	10:43:30	0:00:30	M	04 67 238	37 70 262	Flying-cruising, flew to SE and lost contact	94.7	98.8	0.8	1.6	SW
1-Sep	11:06:00	11:06:10	0:00:10	M	04 67 037	37 70 702	Flying-cruising N	93.8	101.8	0.0	0.0	
5-Sep	12:46:53	12:48:57	0:02:04	2M	04 67 170	37 70 697	Flying-cruising - never landed - no interaction seen between males	97.6	139.1	3.1	5.3	W
5-Sep	13:43:31	13:44:08	0:00:37	M	04 67 126	37 70 695	Flying-cruising - never landed	97.0	138.1	7.2	9.5	W

Footnotes

1. Behaviors referenced
 - a. NR – not recorded
 - b. “flying – cruising” = a typical male DSF behavior where the fly cruises at a low altitude from 0 to 1 meter in a somewhat random fashion generally from shrub to shrub,
 - c. “perched” – resting on a substrate, and
 - d. “fighting” – antagonistic encounter between two male DSF,
2. Plant codes used
 - a. ERIFAS = *Eriogonum fasciculatum* (California buckwheat),
 - b. HETGR = *Heterotheca grandiflora* (telegraph weed),
3. Air temperatures taken in the shade at 1.5 m in the same area as observation. NR = not recorded.
4. Surface temperatures were taken in open sun on the surface of the sand in the same area as observation. NR = not recorded.

Table 4b. Observation times, location notes, behavior, and weather conditions for 32 DSF observations at the area west of George Brown Park

Date (2010)	Start time	End time	Total contact time	Sex	Coordinates of initial observation (UTM, NAD-83, Grid 11) Easting	Coordinates of initial observation (UTM, NAD-83, Grid 11) Northing	Behavior ^{1,2}	Air temp (F) ³	Sfc temp (F) ⁴	Wind avg (mph)	Wind max (mph)	Direction
4-Aug	12:35:00	12:35:30	0:00:30	M	04 66 706	37 70 664	Flying-cruising	90.2	NR	3.0	4.5	SW
4-Aug	12:38:00	12:39:00	0:01:00	M	04 66 696	37 70 710	Flying-cruising from HETGRA to HETGRA	NR	NR	NR	NR	NR
4-Aug	12:57:00	12:58:00	0:01:00	M	04 66 693	37 70 811	Random flying-cruising	94.6	NR	4.2	5.5	SW
11-Aug	10:49:00	10:49:10	0:00:10	2 M	04 66 669	37 70 704	Fighting	NR	NR	NR	NR	NR
11-Aug	10:55:00	10:55:10	0:00:10	2 M	04 66 691	37 70 771	Fighting	79.3	NR	2.1	3.1	SW
11-Aug	10:38:00	10:39:30	0:01:30	3 M	04 66 698	37 70 673	Random flying-cruising & fighting	76.1	NR	2.2	4.2	SW
11-Aug	10:52:00	10:52:30	0:00:30	M	04 66 660	37 70 745	Perched on sand	NR	NR	NR	NR	NR
17-Aug	12:34:00	12:36:00	0:02:00	M	04 66 699	37 70 656	Random flying-cruising and searching AMBACA	101.8	116.7	2.5	3.5	W
17-Aug	12:41:00	12:43:00	0:02:00	M	04 66 702	37 70 711	Flying-cruising and searching HETGRA to HETGRA	104.9	110.5	2.3	3.8	W
17-Aug	12:50:00	12:50:30	0:00:30	M	NR: battery died	NR: battery died	Flying-cruising to N	103.2	114.4	2.6	4.4	SW
22-Aug	11:05:19	11:09:16	0:03:57	2M	04 66 730	37 70 691	Flying-cruising interacted with another male - never landed 30 m radius area	93.2	135.0	2.8	3.6	W
22-Aug	11:37:20	11:46:59	0:09:39	2M	04 66 681	37 70 796	Flying-cruising - perched twice on HETGRA for 1 sec each time - 40 m radius area	94.6	141.1	1.3	3.1	VAR
22-Aug	10:55:49	10:56:19	0:00:30	M	04 66 704	37 70 659	Flying-cruising at low altitude - perched for 1 sec on ERIFAS	91.3	125.5	3.7	6.0	W
22-Aug	11:59:47	12:00:56	0:01:09	M	04 66 667	37 70 790	Flying-cruising in vicinity of previous female	93.0	138.6	2.8	4.0	VAR
22-Aug	11:52:21	11:59:47	0:07:26	M,F	04 66 667	37 70 790	Contact with male and female, remained with female perched on HETGRA	93.0	138.6	2.8	4.0	VAR
25-Aug	12:16:00	12:16:30	0:00:30	M	04 66 647	37 70 760	Flying-cruising HETGRA	109.1	122.3	2.0	2.7	SW
25-Aug	12:54:00	12:58:00	0:04:00	M	04 66 683	37 70 525	Perched on unknown shrub - broke contact to continue surveys	103.5	104.0	0.0	0.0	
30-Aug	12:33:46	12:53:15	0:19:29	F	04 66 689	37 70 701	Perched on sand	75.9	124.0	3.8	5.7	W
30-Aug	13:02:48	13:08:05	0:05:17	M	04 66 745	37 70 732	Flying-cruising - perched on sand and shrubs several times for brief periods	78.2	127.0	2.1	3.0	S

Table 4b (cont). Observation times, location notes, behavior, and weather conditions for 32 DSF observations at the area west of George Brown Park

Date (2010)	Start time	End time	Total contact time	Sex	Coordinates of initial observation (UTM, NAD-83, Grid 11) Easting	Coordinates of initial observation (UTM, NAD-83, Grid 11) Northing	Behavior ^{1,2}	Air temp (F) ³	Sfc temp (F) ⁴	Wind avg (mph)	Wind max (mph)	Direction
30-Aug	13:21:21	13:22:23	0:01:02	M	04 66 663	37 70 721	Flying-cruising and perched briefly on HETGRA and sand	76.5	132.2	4.3	5.7	S
1-Sep	13:02:00	13:02:30	0:00:30	F	04 66 711	37 70 681	perched on HETGRA, flew to the N	102.2	109.7	1.0	2.1	SW
5-Sep	11:34:36	11:35:02	0:00:26	F	04 66 679	37 70 669	Perched on ERIFAS then flew in a straight line to the E	97.3	129.2	1.3	2.4	S
5-Sep	10:53:07	10:55:10	0:02:03	M	04 66 749	37 70 620	Flying-cruising - perched briefly on HETGRA and ERIFAS a few times	91.0	126.7	3.9	5.2	W
5-Sep	11:10:30	11:11:33	0:01:03	M	04 66 804	37 70 749	Flying-cruising - never landed	92.5	126.0	2.6	4.2	W
5-Sep	11:22:22	11:24:25	0:02:03	M	04 66 662	37 70 727	Flying-cruising - never landed - flew halfway across Indigo Ave and returned	94.6	136.0	1.5	3.4	W
5-Sep	11:32:34	11:34:05	0:01:31	M	04 66 685	37 70 669	Flying-cruising - perched once on HETGRA and ERIFAS	97.3	129.2	1.3	2.4	S
5-Sep	12:13:32	12:14:28	0:00:56	M	04 66 721	37 70 605	Flying-cruising - perched once briefly on HETGRA	95.0	135.4	2.7	3.4	W

Footnotes

1. Behaviors referenced
 - a. NR – not recorded
 - b. “flying – cruising” = a typical male DSF behavior where the fly cruises at a low altitude from 0 to 1 meter in a somewhat random fashion generally from shrub to shrub,
 - c. “perched” – resting on a substrate, and
 - d. “fighting” – antagonistic encounter between two male DSF,
2. Plant codes used
 - a. ERIFAS = *Eriogonum fasciculatum* (California buckwheat),
 - b. HETGR = *Heterotheca grandiflora* (telegraph weed)
 - c. AMBACA = *Ambrosia acanthicarpa* (bur-sage),
3. Air temperatures taken in the shade at 1.5 m in the same area as observation. NR = not recorded.
4. Surface temperatures were taken in open sun on the surface of the sand in the same area as observation. NR = not recorded.

Table 5a. Behavioral analysis of 43 Delhi Sands Flower-loving Fly observations at the area east of George Brown Park during 2010

Behaviors observed	Males - No. of observations (n=30)	Males - % of observations	Females - No. of observations (n= 8)	Females - % of observations	Total no. of observations	Total % of observations
Flying-cruising	26	86.7%	0	0.0%	26	60.5%
Flying - straight line	4	13.3%	4	50.0%	8	18.6%
Perched on HETGRA	3	10.0%	2	25.0%	5	11.6%
Perched on ERIFAS	3	10.0%	5	62.5%	8	18.6%
Perched on CROCAL	0	0.0%	0	0.0%	0	0.0%
Perched on sand	2	6.7%	1	12.5%	3	7.0%
Perched on other substrate	0	0.0%	0	0.0%	0	0.0%
Abdominal extension				0.0%	0	0.0%
Moving claspers	0	0.0%				
Intraspecies interaction	6	20.0%	1	12.5%	7	16.3%
Interspecies interaction	1	3.3%	0	0.0%	1	2.3%

Plant codes:HETGRA = *Heterotheca grandiflora* (telegraph weed)ERIFAS = *Eriogonum fasciculatum* (California buckwheat)CROCAL = *Croton californicus* (California croton)

Table 5b. Behavioral analysis of 32 Delhi Sands Flower-loving Fly observations at the area west of George Brown Park during 2010

Behaviors observed	Males - No. of observations (n=28)	Males - % of observations	Females - No. of observations (n= 4)	Females - % of observations	Total no. of observations	Total % of observations
Flying-cruising	22	78.6%	0	0.0%	0	0.0%
Flying - straight line	1	3.6%	2	50.0%	0	0.0%
Perched on HETGRA	4	14.3%	2	50.0%	6	18.8%
Perched on ERIFAS	3	10.7%	1	25.0%	4	12.5%
Perched on CROCAL	0	0.0%	0	0.0%	0	0.0%
Perched on sand	3	10.7%	1	25.0%	4	12.5%
Perched on other substrate	2	7.1%	0	0.0%	2	6.3%
Abdominal extension	0	0.0%	0	0.0%	0	0.0%
Moving claspers	0	0.0%	0	0.0%	0	0.0%
Intraspecies interaction	9	32.1%	0	0.0%	9	28.1%
Interspecies interaction	0	0.0%	0	0.0%	0	0.0%

Plant codes:HETGRA = *Heterotheca grandiflora* (telegraph weed)ERIFAS = *Eriogonum fasciculatum* (California buckwheat)CROCAL = *Croton californicus* (California croton)

FIGURES

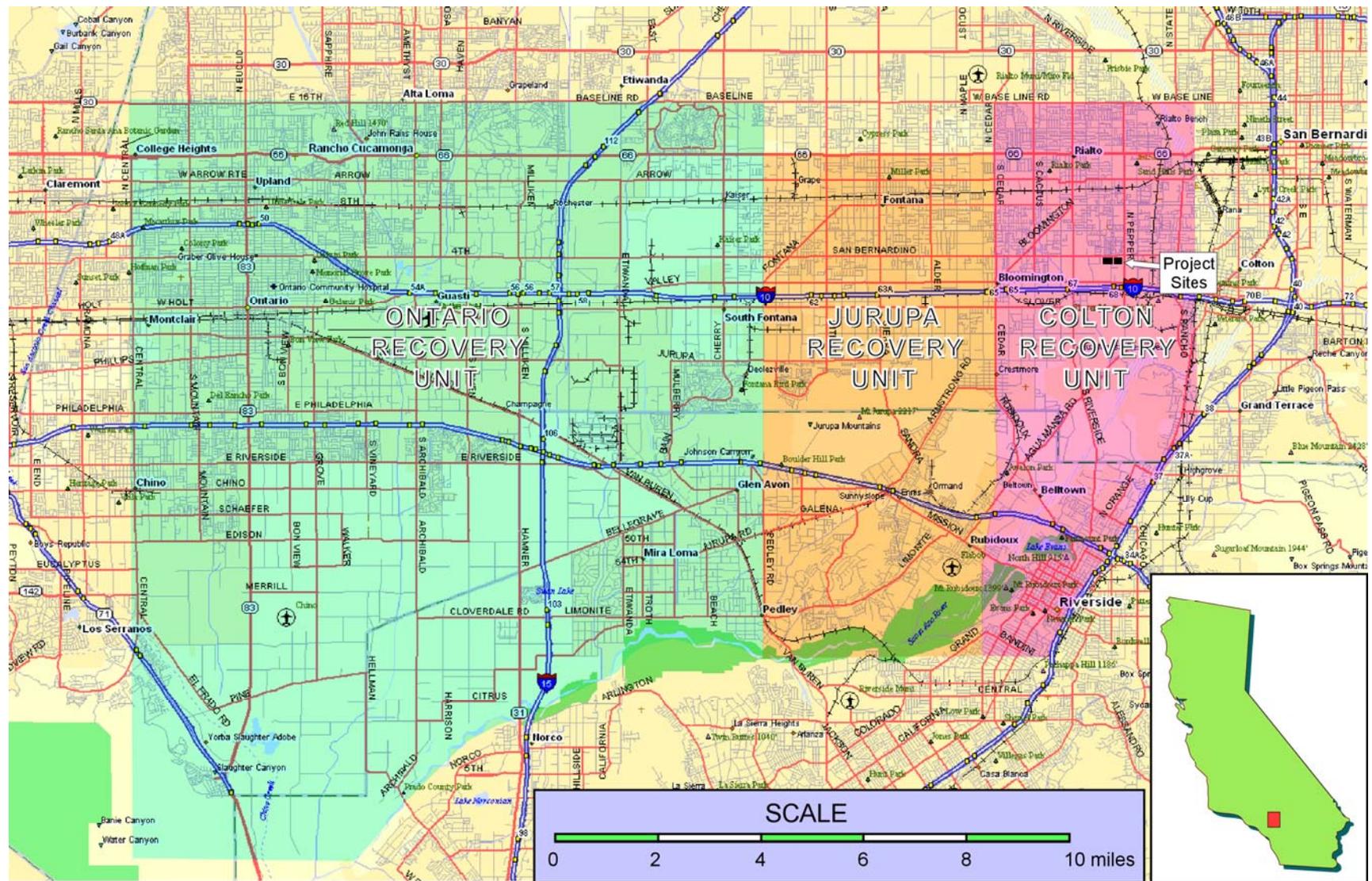


Figure 1. Project Vicinity and Recovery Unit Map



Figure 3. Survey area west of George Brown Park with DSF observations

APPENDICES

APPENDIX 1. SITE PHOTOGRAPHS



Photograph 1. Aerial oblique of survey area east of George Brown Park



Photograph 2. Aerial oblique of survey area west of George Brown Park



Photograph 3. Typical habitat – Survey area east of George Brown Park looking north



Photograph 4. Typical habitat – Survey area west of George Brown Park looking east-southeast from Indigo Avenue



Photograph 5. Mating DSF observed at survey area east of George Brown Park on 11 August, 2010

APPENDIX 2. CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

California Native Species Field Survey Form

Mailto:
 Natural Diversity Database
 California Dept. of Fish and Game
 180713th Street, Suite 202
 Sacramento, CA 95814

For Office Use Only

Source Code _____ Quad Code _____
 Elm Code _____ Occ. No. _____
 EO Index No. _____ Map Index No. _____

Date of Field Work: 7/1 to 9/20 - 2010
month (mm) date (dd) year (yyyy)

Scientific Name: *Rhaphiomidas terminatus abdominalis*

Common Name: Delhi Sands Flower-loving Fly

Species Found? _____
yes no If not, why?
 Total No. Individuals 75 Subsequent Visit? yes no 14 total
Is this an existing NDDB occurrence? no unk
Yes, Occ. #
 Collection? If yes: _____
Number Museum / Herbarium

Reporter: Gilbert Goodlett
Address: 1660 West Franklin Avenue
 Ridgecrest, California 93555
Email Address: torthunter@aol.com
Phone: (760) 371-3592

Plant Information

Phenology: 60 40 20
% vegetative % flowering % fruiting
 Phenology data was not collected and these data are speculative

Animal Information

Age Structure: 75 0 0
adults # juveniles # unknown
 breeding wintering burrow site rookery nesting other

Location (please also attach or draw map on back)

County: San Bernardino Landowner/Mgr.: _____
 Quad Name: San Bernardino South 1:24,000 Elevation: 1101 ft.
 T 1S R 5W _____ 1/4 of _____ 1/4 of Section N 1/2 of 24 R _____ 1/4 of _____ 1/4 of Section _____
 UTM Zone: 11 (10, 11) Datum: NAD83 (NAD83, NAD27, WGS84, other)
 Source: GPS (GPS, map & type, etc.) Point Accuracy: 10 Meters
 UTM Coordinates 04 67 041E, 37 70 826N

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope)
 Survey area included 2 sites, one east and one west of George Brown Park along San Bernardino Avenue. Habitat is relatively undisturbed dune of Delhi series fine soils.
 Other raraspecies? None

Site Information Overall site quality Excellent Good Fair Poor
 Current/surrounding land use: Surrounding land use includes residential housing and commercial development.
 Visible disturbances/ possible threats: Development
 Comments: This form submitted as per U.S. Fish and Wildlife Service protocols for Delhi Sands Flower-loving Fly surveys

Determination: (check one or more, and fill in blanks)

Keyed (cite reference): _____
 Compared with specimen housed at: _____
 Compared with photo / drawing in: _____
 By another person (name): _____
 Other: Extensive field experience in ID of species

Photographs: (check one or more)

	Slide	Print
Plant / animal	<input type="checkbox"/>	<input type="checkbox"/>
Habitat (Digital format)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Diagnostic feature	<input type="checkbox"/>	<input type="checkbox"/>

May we obtain duplicates at our expense? yes no