

**Casey's June Beetle (*Dinacoma caseyi*)
Survey Guidelines**

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INTRODUCTION

The Casey's June Beetle (*Dinacoma caseyi*, "CJB") was listed as an endangered species on October 24, 2011 (76 FR 58954), and is protected under the provisions of the Endangered Species Act of 1973, as amended (Act). This document provides guidance on presence/absence survey methodology for biologists possessing a current recovery permit for CJB pursuant to section 10(a)(1)(A) of the Act, and replaces any previous U.S. Fish and Wildlife Service ("USFWS", "we", "our") guidance for CJB presence/absence surveys. These guidelines will help to determine the presence of adult CJB (especially flying male CJB); these guidelines are not designed to detect the presence of all life stages of CJB or to provide exact delineation of CJB within individual site(s). Results obtained from surveys that follow these guidelines will help the USFWS to assess the status of the CJB, provide information needed to help avoid/minimize impacts to CJB from project implementation, and provide information needed to help with the recovery of the CJB.

The USFWS will accept the results of surveys for CJB if: 1) the specific survey methods described below are followed (unless deviations are requested in writing prior to the survey and approved by the USFWS); and 2) survey reporting requirements described below are met. We recommend that surveyors meet with staff from the USFWS Palm Springs Field Office (Telephone: 760-322-2070) prior to the onset of CJB surveys to review the site to be surveyed and for answers to questions related to CJB survey protocols. These pre-survey meetings (including requests for deviations) do not preclude the pre-survey notification requirement stipulated under recovery permits. Pre-survey notifications shall be submitted to the Carlsbad Fish and Wildlife Office (CFWO) Recovery Permit Coordinator at least 15 days prior to commencement of activities.

SITE ASSESSMENTS

We require site assessments be conducted for all projects mapped within the potential range of CJB (Figure 1). Site assessments are used to determine if a project site contains areas where surveying for CJB is required. If a site does not contain such areas, (*i.e.*, is comprised solely of "excluded" areas as defined below), surveys would not be required.

- ❖ Site assessments involve conducting a general field survey of the site, and mapping excluded areas and CJB survey areas on a U.S. Geological Survey 7.5' (1:24,000) topographic quadrangle map enlarged 200 percent.
- ❖ The site assessment shall be conducted before the first CJB survey.

- ❖ Excluded Areas not required for CJB surveys:
 - Lands with a mountainous, rocky slope greater than 9 percent;
 - Lands entirely covered with asphalt, cement, or other artificial material; and
 - Lands smaller than 0.2 hectare (0.5 acre) and completely surrounded by urban development.
- ❖ Casey's June Beetle Survey Areas are all areas within the likely range of CJB (Figure 1) that are not excluded.

CASEY'S JUNE BEETLE SURVEYS

Surveys for CJB shall be conducted on CJB Survey Areas for 2 consecutive years. Surveys for CJB shall not be conducted concurrently with any other focused survey (*e.g.*, a Peninsular bighorn sheep or desert tortoise survey). Surveys for adult male CJB shall utilize black (ultraviolet) light traps, while surveys for adult female CJB and emergence holes (of both genders) shall use visual searches.

Time of Year(s)

Surveys for CJB shall be conducted at a minimum from the beginning of April through the end of May for each of 2 consecutive years.

- ❖ The entire Survey Area shall be surveyed for CJB at least once per week for nine weeks, from 1 April through 2 June. (Example: Week 1 surveys shall be conducted between 1–7 April, Week 2 surveys shall be conducted between 8–14 April, and so on.)
- ❖ Surveys shall be spaced no closer than 4 day intervals and no further than 7 day intervals. (Example 1: If the Week 1 survey is conducted on 4 April, then the Week 2 survey could be conducted between 8–11 April [between 4–7 days after the previous survey *and* conducted during the subsequent week]. Example 2: If Week 2 survey is conducted on 8 April, then the Week 3 survey could be conducted on 15 April [conducted during the subsequent week *and* no more than 7 days after the previous survey].)
- ❖ The first required survey shall begin during the first 7 days of April.

Weather-related Conditions

Weather conditions shall be assessed during each survey period.

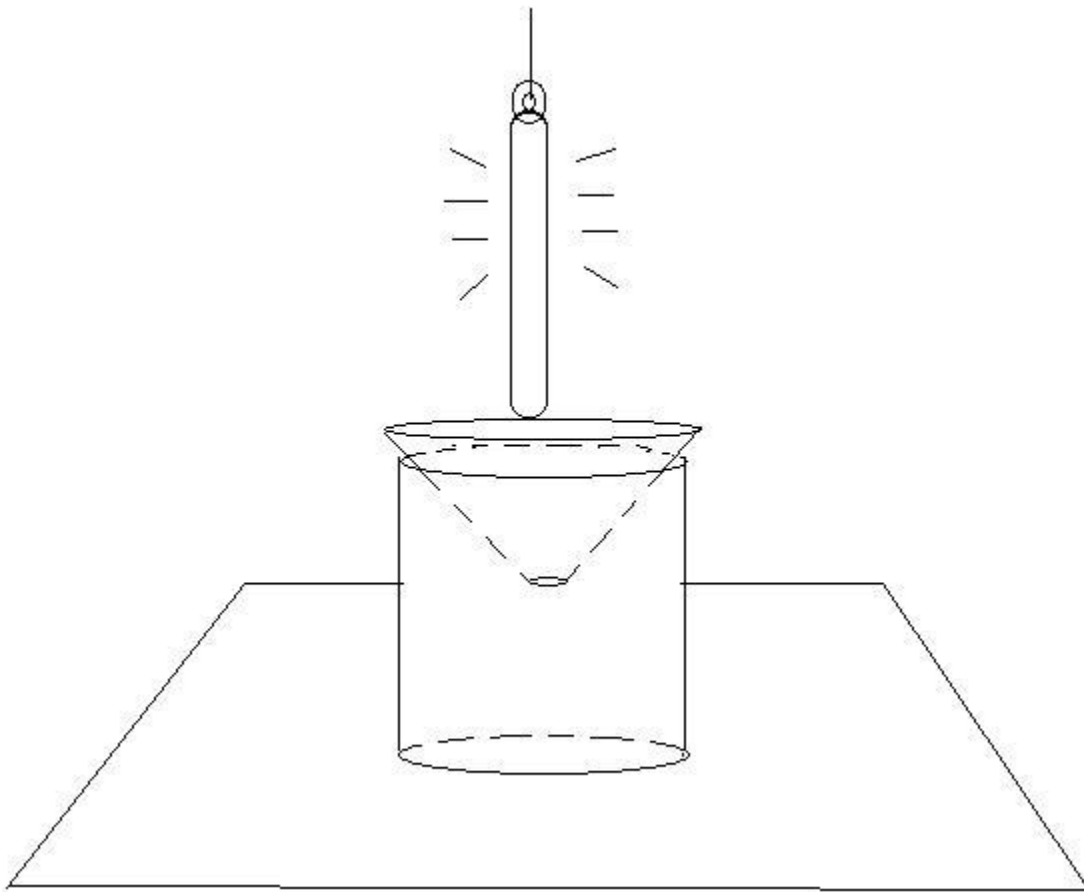
- ❖ Surveys will not be conducted when the following adverse weather conditions exist:
 - Fog, drizzle, or rain;
 - Sustained or gusting winds that average greater than 8 kilometers (5 miles) per hour measured over a 60 second period at a height of 1 meter (3.28 feet) above ground level; and
 - Temperatures that average less than 27 degrees (°) Celsius (C) (80 degrees Fahrenheit) measured over a 60 second period at a height of 1 meter (3.28 feet) above ground level.

- ❖ Weather conditions are to be measured on site, using appropriate instrumentation, and are not to be estimated or obtained from measurements recorded off site.
- ❖ If a survey scheduled for the end of a 7-day interval is missed due to adverse weather conditions, the subsequent survey shall begin during the first available day that weather and safety conditions allow.
- ❖ A weekly survey period should only be missed because of adverse weather for the entire week. For each survey week missed due to adverse weather conditions, a replacement survey week shall be added to the end of the initial 9 week survey period. (Example: High winds, cold temperatures, and rainfall do not allow CJB surveys to be undertaken for the first two weeks of the survey season, 1–14 April. The first replacement survey shall be undertaken during June 3–9, the second replacement survey shall be undertaken during June 10–16, and so on).
- ❖ Because CJB adults may not emerge at detectable densities due to extended larval diapause during years of less than or equal to the lower 25th percentile of average yearly (water year: July 1st through June 30th) rainfall collected at the Palm Springs Regional Airport (see 'WEB RESOURCES' below), lack of adult CJB observation(s) under such conditions may not be considered adequate evidence to conclude a particular site is unoccupied by CJB, even if guidelines are followed. If surveys are conducted within the lower 25th percentile of average yearly rainfall for 2 consecutive years, the USFWS may require a 3rd consecutive year of survey. Nevertheless, we encourage surveys be conducted regardless of rainfall levels because negative adult data can be useful long-term to support conclusions of population absence.

Black Light Trap Requirements (Adult Male Casey's June Beetle)

We assume that only adult male CJB can fly (USFWS 2011) and that adult male CJB can be captured using standard insect black light traps.

- ❖ Traps shall use at least a minimum of one 15 watt black light tube or two 8 watt black light tubes. Additional and higher wattage black lights are both acceptable for use.
- ❖ The black light(s) shall be suspended just above an approximately 19 liter (5 gallon) bucket that is topped with a funnel (approximately 20-25 centimeter (cm) (8-10 inch (in)) tall overall and approximately 5 cm (2 in) wide at its lower opening) that leads to the inside of the bucket.
- ❖ The bucket apparatus shall be placed on top of at least a 2 meter (m) (6.56 feet (ft)) square large white sheet to help observe any CJB that miss the bucket and land on the ground. By increasing the visibility of CJB on the ground, a sheet will also reduce the chances of stepping on individual CJB when checking bucket contents.
- ❖ Figure 2, below, shows a simple black light trap with a 5 gallon bucket, funnel, suspended 15 watt black light, and white sheet (not to scale). Methods of suspension vary.



Spatial Scale of Survey Effort

We assume that a single 15 watt black light may attract CJB within a 100 m (328 ft) radius. We also assume that, within the 100 m radius, attraction diminishes with distance away from the light source.

- ❖ The *entire* Survey Area shall be surveyed for CJB during each survey.
- ❖ Traps shall be arranged in a way that allows the surrounding 100 m (328 ft) radius areas both to overlap and to cover the entire site being surveyed (Figure 3).
- ❖ Surveyors should space black light traps so that there is approximately 25 percent overlap of the straight-line distance between traps (Figure 3).
- ❖ The location of each light trap shall remain the same throughout all 7-day survey periods.

Temporal Scale of Survey Effort; Captured CJB Instructions

At least 4 hours of light trapping are required per trap per evening. For more information on required survey and reporting information, see 'FINAL (OR "45-DAY") SURVEY REPORTS' below.

- ❖ Actively monitored light trapping shall commence 1 hour before sunset (see 'WEB RESOURCES' below) and continue for at least 3 hours after sunset, for a total of at least 4 hours of continuous trapping per trap per survey.
- ❖ Light trapping for CJB is not permitted past midnight.
- ❖ Light traps and white sheets shall be checked for CJB at least once per hour.
- ❖ If CJB are present, bucket contents and white sheets shall be photographed at least once per hour.
- ❖ At a minimum, one captured CJB per trap per survey shall be photographed at a scale such that a positive identification can be confirmed. All photographs shall include a metric ruler (with 1 mm intervals) for scale.
- ❖ Captured CJB individuals shall be transferred to and held within a dark, clean container until the end of that survey period for that evening. Each black light trap will have a separate holding container.
- ❖ Information shall be recorded hourly, as well as at the beginning and end of each survey evening, at the edge of the white sheet associated with each light trap used. See 'FINAL (OR "45-DAY") SURVEY REPORTS' below for a list of data that shall be recorded (hourly and nightly) during each survey.
- ❖ At the end of the evening survey and after black lights have been turned off, any captured CJB individuals shall be released into natural habitat within the 100 m (328 ft) radius area of survey surrounding each light trap where the CJB individuals were captured. The release shall be conducted once all equipment is off site and surveyors are ready to depart the site. Casey's June Beetle individuals shall be released by gently tipping the holding container, allowing the CJB individuals to slide out into the environment.

Emergence Holes; Adult Female Casey's June Beetle

A recovery permit authorizing survey activities is required to search for adult female CJB because this activity may result in injury and/or mortality to the CJB. Adult female CJB are not known to fly, could be trampled under the low-light conditions when they are active, and are more difficult to find than adult male CJB. No recovery permit authorizing survey activities is required to survey for adult CJB emergence holes if the surveys are conducted during daylight hours. Given that emergence holes are only observed under specific soil and environmental conditions, the USFWS will not consider the absence of emergence holes as an absence of CJB.

- ❖ If a permitted light-trapping surveyor observes adult female CJBs while conducting light trapping surveys, or CJB emergence holes during daylight surveys, then the surveyor shall photograph the adult females or emergence holes. All photographs shall include a metric ruler (with 1 mm intervals) for scale.

- ❖ These locations (*i.e.*, adult females, emergence holes / clusters) and photographs shall be included in the final survey report (see 'FINAL (OR "45-DAY") SURVEY REPORTS' below).

Death of Casey's June Beetle

CJB that are incidentally killed or injured during permitted activities shall be reported to the Regional Recovery Permit Coordinator and the CFWO Recovery Permit Coordinator, and activities must cease until reauthorized in accordance with the recovery permit. For more information, please refer to the terms and conditions of the recovery permit. We encourage permittees to report all other mortalities detected (*e.g.*, mortalities attributed to a storm event) within 2 calendar days via email to the CFWO Recovery Permit Coordinator (760-431-9440). The permittee shall also submit the dead specimen(s) and report as follows (required for incidental mortalities and encouraged for natural mortalities):

- ❖ Place dead CJB in cotton within a sealable, rigid container to prevent jostling which could cause limb or antennae damage. Place one CJB specimen per container.
- ❖ Each specimen shall have a unique alphanumeric name assigned. This alphanumeric name should be the initials of the permitted surveyor (*e.g.*, Jane Johnson, first dead CJB = JJ001). Place the alphanumeric name inside each container to ensure accurate future identification.
- ❖ A label with the date found dead, name of person who found the dead CJB, and location (UTM latitude and longitude) should be included with the dead CJB.
- ❖ Specimen(s) shall be submitted to the USFWS Palm Springs Field Office (Telephone: 760-322-2070), who will route the specimens to the Entomological Museum, University of California, Riverside, California after processing.
- ❖ Incidental mortality information (*e.g.*, date, time, location, cause of death, photographs) also shall be included within the final survey report. Additional information in the survey report regarding observations of natural mortalities is encouraged.

24-HOUR REPORTS

- ❖ First observation(s) (or collection(s)) of a suspected or known CJB at a survey site shall be reported by the permitted biologist within 24 hours by telephone to the CFWO Recovery Permit Coordinator. The permittee shall follow up this notification by submitting a 24-hour report by email within 2 business days to the CFWO Recovery Permit Coordinator. Subsequent observations at the same site are not reported in a 24-hour report, but in the Final Survey Report.
- ❖ These reports shall include:
 - Name and permit number of the permitted biologist who made the observation;
 - Date of the observation; and
 - Map. A map shall be submitted as follows:
 - Occurrence location(s) shall be delineated on a 7.5 minute U.S. Geological Survey (USGS) topographic map at 1:24,000 scale. Name of USGS map shall be identified. If the USGS map name is unavailable, graticules or tics shall be used

to depict the map location. The map should use the 1983 North American Datum, as well as the Universal Transverse Mercator (UTM) projection and coordinate system (Zone 11 North); OR

- Occurrence location(s) on maps generated in the software program “Google Earth” will be accepted for 24-hour reports—but not 45-day reports—and only if the following features are provided: (1) the status bar is turned on; (2) the coordinate system is set to UTM Zone 11 North; (3) the scale legend is turned on and set at approximately 1,219 m (4,000 ft) or less; and (4) road features are turned on; AND IF POSSIBLE
- Occurrence location(s) in an attributed Geographic Information Systems format that is compatible with ArcMap software (*e.g.*, shapefile). Location data shall have been collected using the 1983 North American Datum, as well as the Universal Transverse Mercator (UTM) projection and coordinate system (Zone 11 North).

FINAL SURVEY (OR “45-DAY”) REPORTS

- ❖ Within 45 days of the final survey, permitted biologists shall submit a written report signed and certified by each surveyor(s) performing activities in independent status pursuant to a section 10(a)1(A) Recovery Permit.
- ❖ A hard copy of the survey report and an electronic copy in PDF format shall be submitted to the CFWO Recovery Permit Coordinator. Additionally, results (*e.g.*, environmental conditions, trap number and location, hourly captures) from each trap and survey shall be submitted to the CFWO Recovery Permit Coordinator in one of three electronic formats (Excel, Word, or shapefile).
- ❖ Final survey reports shall include at least four major components:
 - A survey/site description, with the following information:
 - Name and permit number of the permitted biologist(s) who conducted the surveys;
 - Survey area name;
 - Detailed description of the plant communities (per Sawyer *et al.* 2009) present at and adjacent to the survey site, including dominant species and habitat quality; and
 - Legible copies/scans of field notes. Illegible notes may not adequately disqualify one or more of the surveys.
 - Survey results, with the following information:
 - Location information of all black light traps and the number, sex, life stage, and location of all (living or dead) CJB occurrences (*e.g.*, adult male CJB, CJB emergence holes);
 - Location information shall be collected using the 1983 North American Datum and the Universal Transverse Mercator coordinate system (Zone 11 North). Accuracy of all Global Positioning System GPS locations should not exceed 5 m (16.4 ft).
 - Comprehensive results from hourly and daily surveys, including name(s) of surveyor(s) with permit status (independent or supervised); site name, date, and location; survey number; time of sunset; trap number and location; survey

start, end, and hourly check times; temperature 1 m (3.28 ft) above ground, at ground level, and 10 cm (0.328 ft) below ground; wind speed; starting percent cloud cover; humidity; barometric pressure; moon phase; sheet size; and numbers of CJB captured in light traps and found on white sheets (CJB found at the edge of, but not on, white sheets should be recorded in the 'Notes' section of the data sheet); and

- Biologists are encouraged to enter these data using the data form provided at the end of this document (Table 1). Required data measurements (*e.g.*, hPa, %) are specified on the data form and data shall be recorded to the tenths decimal place value when possible (*e.g.*, 24.1 °C).
 - A list of other co-occurring insect species observed during the survey.
 - Additionally required and incidental data collected can be recorded and submitted on data sheets formatted by the permitted surveyor.
- Color photographs of the general survey site(s) and the specific survey area(s), with the following instructions:
 - At least four photographs of each site during each survey period, taken in the cardinal directions (*i.e.*, north, south, east, west) and from a standing position that portrays the general landscape of the site (large or oddly-shaped sites may require additional photographs);
 - At least four photographs of each trap location during each survey period, taken in the cardinal directions; and
 - If CJB are present, photographs of bucket and sheet contents (at least once per hour), as well as close-up photographs of a captured, reference CJB (once per survey period).
 - Photographs submitted individually (*e.g.*, those developed from camera film) shall include the following information, written legibly with permanent ink: project name, general location of the project site (*i.e.*, city or distance to the city), precise location of the project site, photograph number, facing direction of the photograph, date the photograph was taken, and the name of the photographer. Photographs submitted electronically or printed within the survey report shall be accompanied with a tabular form of these same metadata.
- Survey report maps, with the following instructions:
 - Location of the survey area delineated on a 7.5 minute USGS topographic map at 1:24,000 scale. Name of USGS map identified. If the USGS map name is unavailable, graticules or tics shall be used to depict the map location, with the PROJECTION and DATUM of the coordinate system identified.
 - Data (*e.g.*, occurrences, emergence holes, light traps) shall be plotted on 1:24,000 or better (*e.g.*, 1:5,000) scale maps, with scale identified on the map. It may be necessary to prepare multiple maps to accurately convey all information. Occurrences shall be labeled such that the reader can associate the map with the findings in the report about individual occurrences. Maps shall be either topographic with elevation contours identified, or aerial photography with locator information identified. Surface features on the occurrence map(s) shall be readable and not masked out by other supplied information, such as plant communities.

- The following elements shall be included on all maps: legend, scale, and orientation (*e.g.*, a north arrow).
- Survey area and data (*e.g.*, occurrence, emergence hole, light trap) shall be provided in a Geographic Information Systems (GIS) format that is compatible with ArcMap software (*e.g.*, shapefile) using the 1983 North American Datum and Universal Transverse Mercator coordinate system (Zone 11 North). Metadata shall be provided. GIS data loaded on a CD shall accompany the hard copy report and, if possible, submitted by email with the electronic copy.

DEVIATIONS FROM PROTOCOLS

The USFWS requires that these protocols are adhered to for the purpose of collecting data useful to the recovery of CJB. However, permittees may request to deviate from these protocols depending on various circumstances (*e.g.*, frequent, multiple-day storm events; flooding of survey area). Questions regarding this document or its application to specific projects, including deviation requests, should be directed to the CFWO Recovery Permit Coordinator at (760) 431-9440, 15 days prior to initiation by email. Each request should provide a full justification, in writing, for any proposed change to these guidelines. ***The Recovery Permit Coordinator will coordinate the request with the appropriate staff at the Palm Springs and Carlsbad Fish and Wildlife Offices.*** If USFWS staff agree with the request, the Recovery Permit Coordinator will approve the request via email. If the proposed changes are not approved, then the Service will respond to the permittee via email and explain why the request is denied. All transactions are handled by the Recovery Permit Coordinator.

LITERATURE CITED

1. For USFWS 2011 (USFWS. 2011. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Casey's June Beetle and Designation of Critical Habitat. 76 Federal Register 58954), refer to the website at: "<http://www.gpo.gov/fdsys/pkg/FR-2011-09-22/pdf/2011-24047.pdf>".
2. For Sawyer *et al.* 2009 (John O. Sawyer, Todd Keeler-Wolf, and Julie M. Evens. 2009. A manual of California vegetation, 2nd edition. California Native Plant Society, Sacramento, California, USA. 1,300 pages. ISBN 978-0-943460-49-9), refer to the California Native Plant Society website at: "<http://www.cnps.org/cnps/vegetation/manual.php>".

WEB RESOURCES

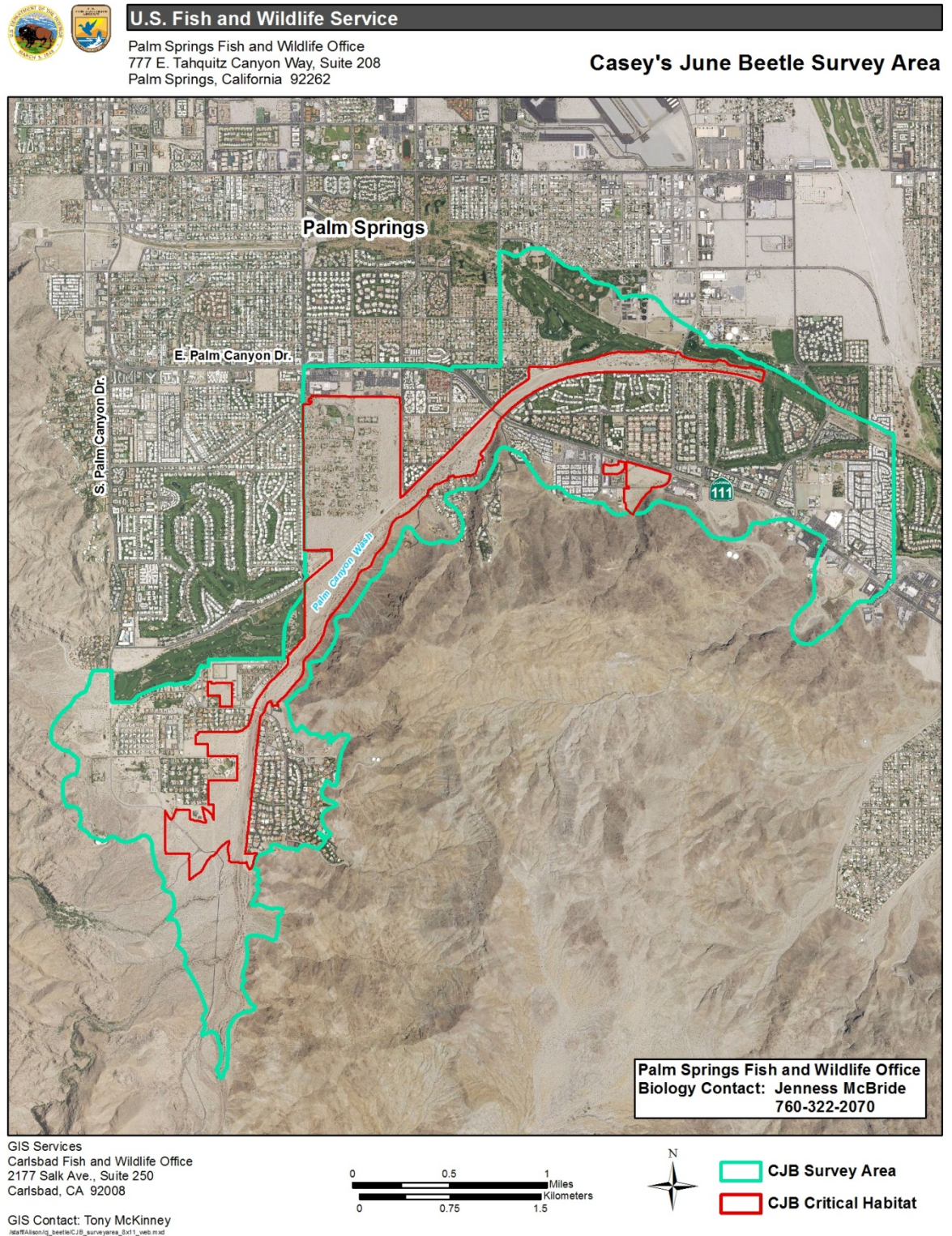
1. To review USFWS species specific information for the Casey's June beetle, refer to the website at: "<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=IOTG>".
2. To review permit and monitoring information for the Casey's June beetle, including an electronic copy (Microsoft Excel) of the data sheet required for use during light trap surveys (Table 1), refer to the

website at: "<http://www.fws.gov/carlsbad/TEspecies/Recovery/SurveyMontInfo/CJBMontInfo.html>".

3. To review sunset times for the City of Palm Springs, refer to the internet (*e.g.*, "<http://www.timeanddate.com>").
4. To review past rainfall levels at the Palm Springs Regional Airport, refer to the internet (*e.g.*, "<http://www.ncdc.noaa.gov/>", "<http://www.weather.gov/help-past-weather>").
5. To review moon phases for specific dates, refer to the internet (*e.g.*, "<http://www.moonpage.com>").

16 March 2016

Figure 1. Casey's June Beetle Survey Area. Red outline = CJB Critical Habitat. Green outline = CJB Recommended Survey Area.



1.

Figure 3. Examples of overlapping black light trap arrangements. White squares with a black dot in center = black light trap on light-colored sheet; Large clear circles = 100 m (328 ft) radius areas within which CJB are presumed to be attracted to the black lights; Beige mottled polygon = Hypothetical sandy survey site. The top image shows an example of a survey that would be accepted by the USFWS: complete and largely overlapping coverage of the site. The bottom 2 images show examples of surveys that would not be accepted by the USFWS: black light coverage does not cover the entire site (bottom two images) and is minimally overlapping (middle image).

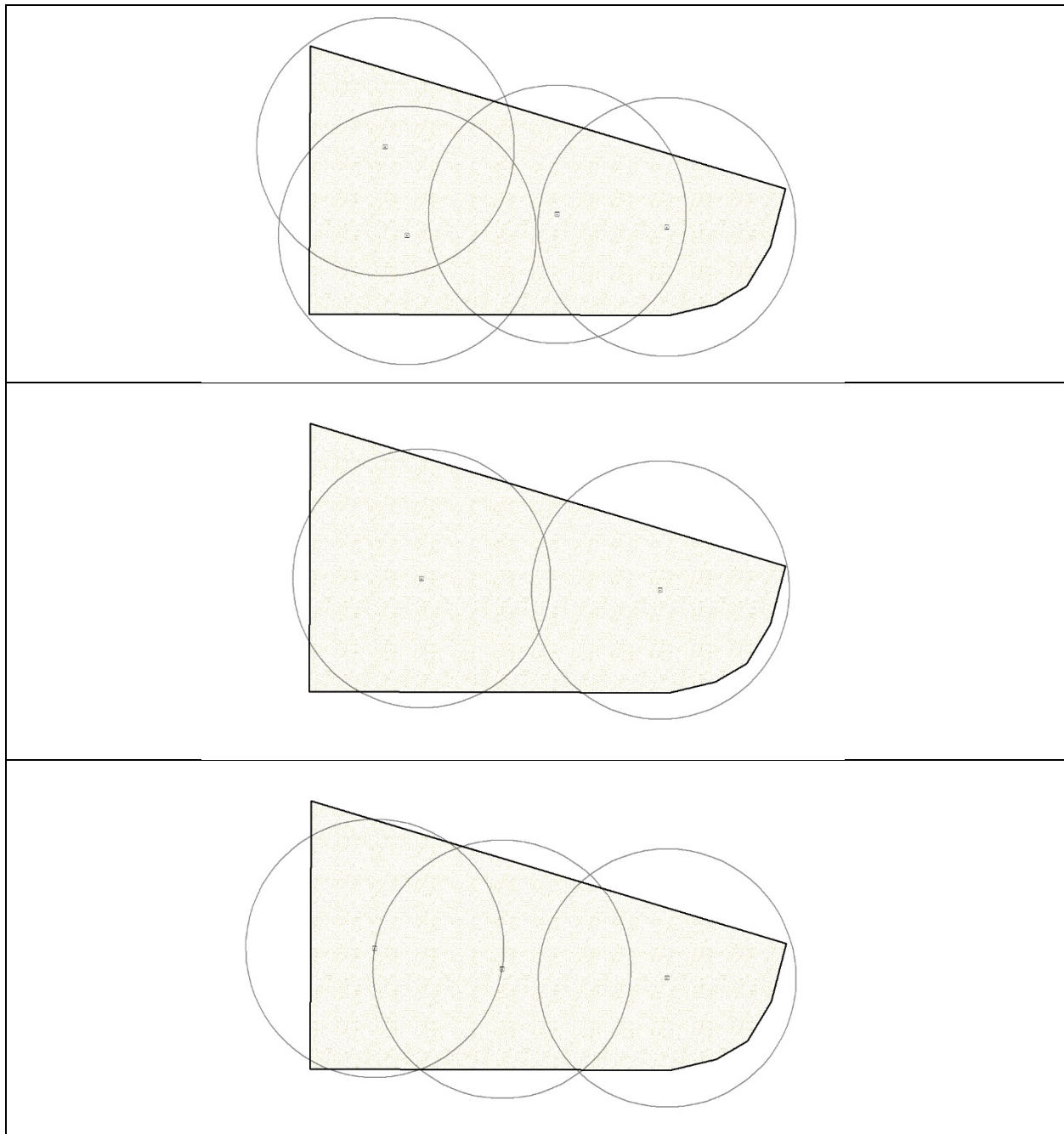


Table 1. Data Sheet Required For Use With CJB Surveys. A sample of the data sheet is provided below. The data sheet has been entered with hypothetical data (gray text) as an example. See 'WEB RESOURCES' above for the internet location of blank data sheets.

| | | | |
|---------------------------------------|----------------------------|-------------------------------|--------------|
| Name of Surveyor(s): | Jane Johnson; Robert Jones | Date: | 1 April 2015 |
| Site Name: | "Oasis Mirage" | Survey Number: | 1 of 9 |
| Site Location: | Waterfront Rd x Canal St | Starting Percent Cloud Cover: | 15 |
| Official Sunset Time (24 hour clock): | 1907 | Moon Phase (% full): | 94 |

| | | | |
|---------------------------------|---------------------------|---------------------|---------|
| Trap Number: | 1 | Trap Longitude (m): | 543785 |
| Sheet Size (m x m): | 2.1 x 2.1 | Trap Latitude (m): | 3738375 |
| Pictures Taken from Trap Edge?: | Yes – all four directions | | |

| | Trap Opened | Hour 1 (Sunset) | Hour 2 | Hour 3 | Hour 4 (Trap Closed) | Notes |
|--------------------------------------|----------------|--------------------|--------|--------|-------------------------|--|
| Time (24 hour clock): | 1800 | 1900 | 2000 | 2100 | 2200 | |
| Temperature 1 m Above Ground (°C): | 32.0 | 31.5 | 30.5 | 29.3 | 28.0 | |
| Temperature At Ground Surface (°C): | 32.0 | 31.4 | 31.0 | 30.2 | 29.0 | |
| Temperature 10 cm Below Ground (°C): | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | |
| Wind Speed (km / hour): | 1.2 | 0.6 | 0.4 | 3.8 | 2.2 | Some wind gusts. |
| Humidity (%): | 12.0 | 12.0 | 12.0 | 13.0 | 13.0 | |
| Barometric Pressure (hPa): | 1017.1 | 1010.0 | 1009.7 | 1008.7 | 1007.7 | |
| | | | | | | |
| Number of CJB in Trap: | - | 0 | 3 | 2 | 1 | No females. |
| Number of CJB on Sheet: | - | 0 | 0 | 1 | 1 | No CJB observed on ground surrounding sheet. |