DOCKETED	
Docket Number:	07-AFC-05C
Project Title:	Ivanpah Solar Electric Generating System (Compliance)
TN #:	226138
Document Title:	Avian & Bat Monitoring Plan
Description:	2017 Fall Report
Filer:	Marichka Haws
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/17/2018 4:10:14 PM
Docketed Date:	12/17/2018

IVANPAH SOLAR ELECTRIC GENERATING SYSTEM
AVIAN & BAT MONITORING PLAN

2017 Fall Report

Prepared for:

Solar Partners I, II, and VIII

100302 Yates Well Road

Nipton, CA 92364

Prepared by:

Western EcoSystems Technology, Inc.

January 2018

415 W. 17th Street, Suite 200, Cheyenne, WY 82001 ◆ Ph: 307-634-1756 ◆ F: 307-637-6981

Executive Summary

Avian and bat monitoring surveys were conducted from 18 August 2017 - 20 October 2017 (the fall season) at the Ivanpah Solar Electric Generating System facility (referred to in this report as "Ivanpah" or "Project") in accordance with the Project's Avian & Bat Monitoring and Management Plan (Plan) as revised November 2015.

Per the revised Plan, potential flux effects were investigated by surveying 100 percent of the tower area in all three units, and potential collision effects with facility structures (towers and heliostats) were evaluated by systematic sampling of 100% of the tower areas. The "tower area" consists of the power block and inner high-density (HD) heliostats surrounding each power block on approximately 154 acres. Searches were conducted within the fall season at intervals of approximately 7 days.

All bird and bat fatalities and injuries, referred to as "detections" in this report, including those found incidentally and during standardized facility searches, were documented and categorized as singed, collision, other project causes, or unknown based on examination with a binocular microscope and evidence collected from the location of the detection. During the period 18 August 2017 – 20 October 2017, seven bat detections and 264 avian detections (which included six injured birds) were found. Of the 264 avian detections, 263 were discovered in the tower area, and one was discovered outside of the tower area.

Per the specifications of the revised Plan, avian detections were categorized by facility structure and cause. These avian fatality search results, along with searcher efficiency and carcass removal rates from trials conducted onsite, were input into a fatality estimator model (Huso 2010) to provide an estimate of the fatalities for the tower area.

Using the fatality estimator model, during the period 18 August 2017 – 20 October 2017, there were an estimated 695 fatalities (79%) from known causes and 180 fatalities (21%) from unknown causes in the tower area. None of the 12 identifiable species represented by more than three detections (all songbirds) is listed or particularly rare locally, regionally, or nationally. Rather, all 12 species are relatively abundant and widespread. Thus, the magnitude of detections of these species at Ivanpah during the 2017 fall season does not rise above the "low" category.

Table of Contents

Section 1.0 Introduction 1

1.1 Project Background 1

1.2 Monitoring Plan Overview and Goals 1

1.3 Purpose of This Report 2

Section 2.0 Methods 4

2.1 Facility Monitoring 4

2.1.1 Standardized Searches 4

2.1.1.1 Areas Surveyed 4

2.1.1.2 Search Frequency and Timing 6

2.1.1.3 Search Methods 6

2.1.2 Carcass Persistence Trials 7

2.1.3 Searcher Efficiency Trials 7

2.1.4 Incidental Reporting 7

2.1.5 Fatality Estimator 8

2.2 Deterrence Measures 11

2.2.1 Avian Measures 11

2.2.2 Bat Measures 12

Section 3.0 Monitoring Results 13

3.1 Summary of Avian Detections 13

3.1.1 Temporal Patterns of Avian Detections 19

3.1.2 Summary of Bat Detections 20

3.2 Locations of Avian Detections 20

3.2.1 Detections by Project Area 20

3.3 Cause of Injury or Fatality 21

3.3.1 Singeing Effects 21

3.3.2 Collisions 21

3.3.3 Other Cause 23

3.3.4 Detections of Unknown Cause 23

3.4 Types of Detections 24

Section 4.0 Fatality Estimation 25

4.1 Estimating Model Parameters 25

4.1.1 Carcass persistence Trials 25

4.1.2 Model Selection for Carcass Persistence Distribution 27

4.1.3 Searcher Efficiency Trials 29

4.2 Tower Area Fatality Estimates of Known Causes for 2017 Fall Monitoring 31
4.3 Tower Area Fatality Estimates from Unknown Causes 32
4.4 Regional Awareness Monitoring 34
Section 5.0 Discussion 35
5.1 Temporal Patterns in Detections 35
Section 6.0 Framework for Management and Risk Response 36
Section 7.0 Literature Cited 38

Figures

Figure 1. Ivanpah Vicinity Map. 3
Figure 2. Ivanpah Search Areas. 5
Figure 3. Ivanpah 1 Detections 16
Figure 4. Ivanpah 2 Detections 17
Figure 5. Ivanpah 3 Detections 18
Figure 6. Number of Detections on Each Survey Date, 18 August 2017 - 20 October 2017. 19
Figure 7. Locations of Singed and Unsinged Detections within Solar Units. 22
Figure 8. Persistence Durations for Small Carcasses Placed for 2017 Fall Carcass Persistence Trials (N = 10). 26
Figure 9. Persistence Durations for Large Carcasses Placed for All Carcass Persistence Trials. 27

Tables

Table 1a. Monitoring Areas. 4
Table 1b. Treatment of Incidental Detections by Location 10
Table 2. Number of Individual Bird Detections, by Species, 2017 Fall Season. 13
Table 3. Avian Injuries Detected 18 August 2017 - 20 October 2017. 20
Table 4. Locations of Avian Detections, 18 August 2017 - 20 October 2017. 20
Table 5. Locations of Bird Detections, 18 August 2017 - 20 October 2017 21
Table 6a. Percent Composition Feather Spots to Carcasses Relative to Site Locations. 24
Table 6b. Percent Composition Feather Spots to Carcasses Relative to Cause. 24
Table 7a. AICc Values for Small Bird Carcass Persistence Models 28
Table 7b. AICc Values for Large Bird Carcass Persistence Models 29

Table 8. Covariates, AICc Values, and ΔAICc values for the top ten searcher efficiency models. Data consist of all human searcher efficiency trials for carcasses from the initiation of trials through 17 October, 2017. 30

Table 9. Human Searcher Efficiency Sample Sizes Used for Modeling, and Model Predictions for Size and Project Area Categories Winter 1 – Fall 4. 31

Table 10a. Number of Bird Detections Based on Known Causes Included or Excluded from Fatality Estimates, by Cause. 31

Table 10b. Number of Bird Detections Based on Known Causes Included or Excluded from Fatality Estimates, by Carcass Size. 32

Table 11. 2017 Fall Season Avian Fatality Estimates by Cause (with Lower and Upper 90% Confidence Intervals) Based on Detections of Known Causes Included in the Model. 32

Table 12. 2017 Fall Season Avian Fatality Estimates by Carcass Size (with Lower and Upper 90% Confidence Intervals) Based on Detections of Known Causes Included in the Model 32

Table 13a Number of Detections from Unknown Causes, and Number Included in Fatality Estimates, by Cause. 33

Table 13b. Number of Detections from Unknown Causes, and Number Included in Fatality Estimates, by Carcass Size 33

Table 14. Site-Wide Fatality Estimates from Unknown Causes by Location, 18 August 2017 - 20 October 2017. 33

Table 15. Site-Wide Fatality Estimates from Unknown Causes by Size and Location, 18 August 2017 - 20 October 2017. 33

Appendices

Appendix A. Individual Avian Detections.

Appendix B. Additional Detection Data for Fatality Estimates and Documentation of Fatality Estimates in which Each Detection was Included.

Section 1.0 Introduction

1.1 Project Background

The Ivanpah Solar Electric Generating System (referred to in this report as "Ivanpah" or "Project") consists of three solar power electrical generating facilities (Units 1, 2, and 3) with a combined net capacity of 377 megawatts. Each unit includes a central power tower with an air cooled condenser (ACC) and associated electrical generating equipment, surrounded by a heliostat array that reflects sunlight to a boiler at the top of the power tower. Ivanpah is located on approximately 1,457 hectares (3,600 acres) of Bureau of Land Management (BLM) land west of Interstate 15 near the town of Nipton in San Bernardino County, California (Figure 1). Construction was initiated in 2010 and completed in late 2013.

1.2 Monitoring Plan Overview and Goals

An Avian & Bat Monitoring and Management Plan (Plan) was prepared by the Project proponents in collaboration with the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), California Energy Commission (CEC), and Bureau of Land Management (BLM) to guide comprehensive monitoring of impacts to birds and bats associated with the operation of the Project. Revision 12 of the Plan (2013) was accepted by the agencies in November 2013 and required two years of monitoring, which were completed at the end of October 20, 2015. As part of the Plan, a Technical Advisory Committee (TAC) with representatives from the agencies and the project was formed to guide implementation of the Plan. The TAC determined that the goals of the Plan (2013) were met, and in November 2015, the TAC-approved Revision 13 to the Plan (2015) to require a third and fourth year of monitoring to provide collision and flux mortality estimates. Revision 13 of the Plan (2015) reflects reduced monitoring requirements (i.e., heliostat areas for Units 1 and 3, the Unit 3 collector line, offsite control transects, and fenceline monitoring were removed from the monitoring for the third year) as informed by the first two years of intensive monitoring. Upon reviewing the third year of monitoring, it was determined that surveys in the heliostat area for Unit 2 met the Plan objectives and were removed after the second quarter (spring) of the fourth year, leaving fatality monitoring in the tower areas for the final two quarters of year four. Thus, the Unit 2 heliostat area was not monitored during the 2017 summer and fall seasons.

Specifically, the Plan (2015) details the onsite and offsite surveys to be conducted and the data analysis and reporting processes that will be implemented by Ivanpah in collaboration with the USFWS, CDFW, CEC, and BLM and provides the following goals and objectives as excerpted from the Plan (2015):

Plan Goals

1. Provide Collision Mortality Estimates: Estimates of avian mortality from collision will be calculated from data obtained by monitoring and identifying avian mortality and injury associated with facility structure collisions.
2. Provide Solar Flux Mortality Estimates: Estimates of avian mortality from flux effects will be calculated from data obtained by monitoring and identifying avian mortality and injury associated with solar flux generated by the facility.

3. Provide a Framework for Management and Response to Risks**:** The designation and description of the functioning of the TAC provides a management and decision framework for the identification and implementation of potential adaptive management measures.

Plan Objectives

The first two years of monitoring documented that the mortality associated with the perimeter fences, transmission lines, and offsite transects was less than 5 detections a season. Additionally, the patterns associated with avian use have been consistent over the seasons and documented in the annual reports, with the heliostat area monitoring complete after 3.5 years. Therefore, as revised, the Plan has the following objectives:

1. Estimate collision-related avian mortality and injury with the following facility structures (Figure 2), using empirical data to calculate facility-wide mortality and injury rates:
   a. Power towers
   b. Heliostats (following Spring 2017 survey, inner high-density heliostats only surveyed as part of tower area)
2. Estimate flux-related avian mortality and injury using empirical data to calculate facility-wide mortality and injury rates.
3. Document patterns of collision or flux-related mortality and injury associated with species, age/sex, season, weather, and visibility.
4. Document spatial patterns associated with collision- or flux-related mortality and injury.
5. Provide quantitative information for developing and implementing adaptive management responses commensurate with identified impacts.

As approved by the TAC, the revised Plan (2015) continues to: 1) satisfy the BLM Right-of-Way (ROW) Permit requirement that the Project proponent develop an avian plan as well as a Migratory Bird Treaty Act (MBTA) Conservation Agreement; 2) satisfy the requirements for the Avian & Bat Monitoring and Management Plan approved by the CEC for Ivanpah per CEC Condition of Certification BIO-21; and 3) achieve the avian and bat protection objectives of the USFWS in relation to the MBTA, Bald and Golden Eagle Protection Act (Eagle Act), and Federal Endangered Species Act (ESA), including preparing written records of the actions that have been taken to avoid, minimize, and compensate for potential adverse impacts to avian and bat species. By developing a proactive management plan in close consultation with the USFWS and other relevant state and federal agencies, Project proponents can effectively comply with the intent of the federal MBTA, Eagle Act, ESA, and relevant state regulations (USFWS 2012).

1.3 Purpose of This Report

This report represents the fourth "quarterly" (i.e., seasonal) report for the fourth year of monitoring (or, the sixteenth quarterly report) summarizing monitoring methods and results for avian and bat fatalities and injuries based on the procedures and requirements specified in the Plan and as required by CEC Condition of Certification BIO-21. This report covers the 2017 fall season, which includes the period from 18 August - 20 October 2017.

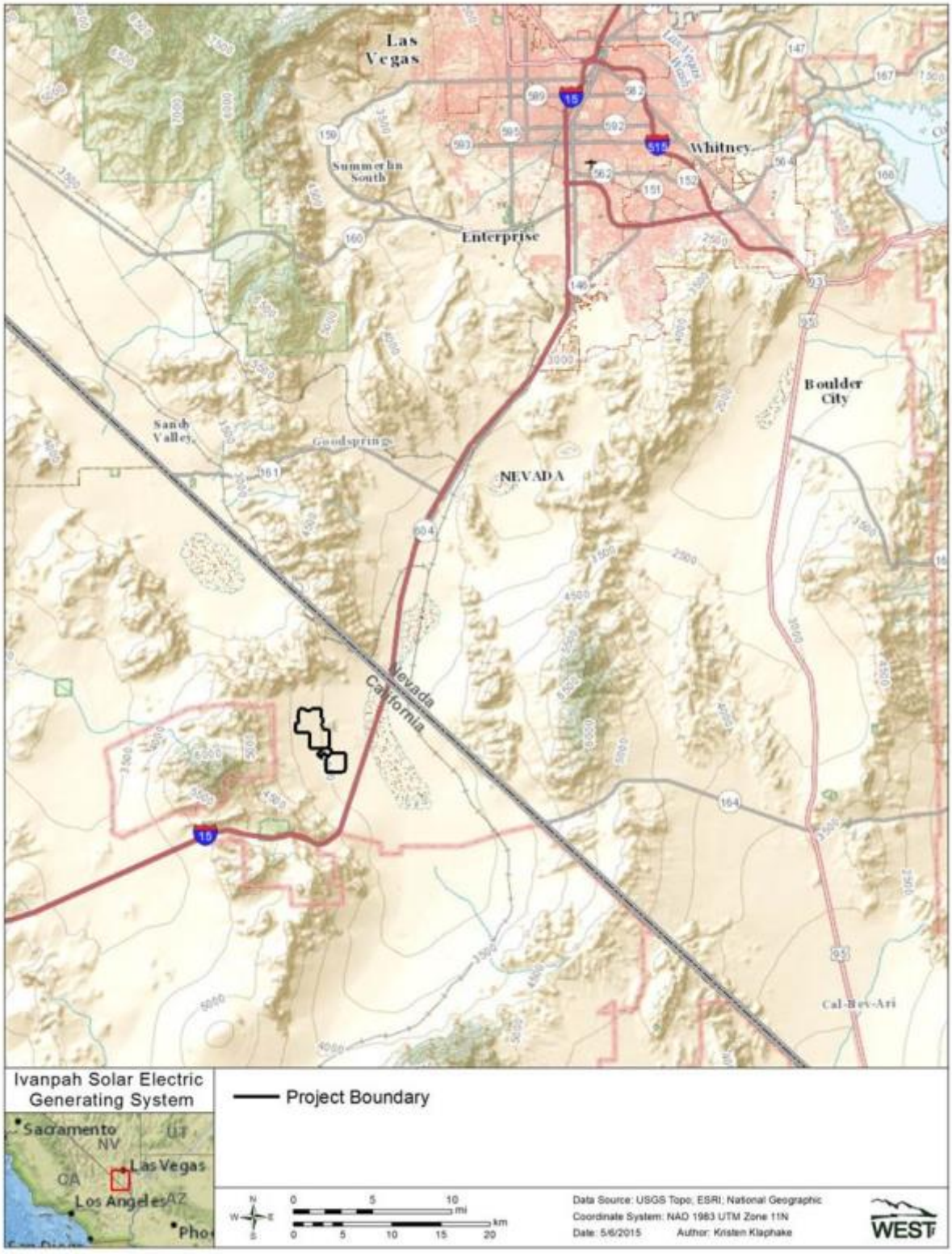

Figure 1. Ivanpah Vicinity Map.

Section 2.0 Methods

The Plan (2015) describes the methods by which monitoring and certain analyses, including compilation of the overall fatality estimate, will occur. Below is an abridged description.

2.1 Facility Monitoring

This section describes areas surveyed, the frequency and timing of the searches, and the methods by which standardized searches were conducted to identify dead/injured birds and bats (hereafter "detections") at the Project. This section also describes the methods for conducting carcass removal and searcher efficiency trials; how data were reported and analyzed for incidental detections; and the methods for producing fatality estimates for the Project.

2.1.1 Standardized Searches

2.1.1.1 Areas Surveyed

Per the Plan (2015), monitoring was conducted in the "tower area" of all three units. The tower area is defined as the power block (the area consisting of the tower, the ACC unit, the associated control building, and immediately adjacent areas defined by the ring road and berm/slopes surrounding these facilities) and inner high-density (HD) heliostats surrounding each power block. In year 3 and year 4, 100% of the tower area at each unit was surveyed and Table 1a provides the acreage searched within the tower area, as well as the percent of the facility represented by the tower area. Overall, approximately 4.8% of the Project was searched (Figure 2).

Table 1a. Monitoring Areas.

Area	Facility Locations Included	Acreage Searched	Percent of Facility
Tower Area	ACC, Power Block, Inner HD	154	4.80%
Total		154	4.80%

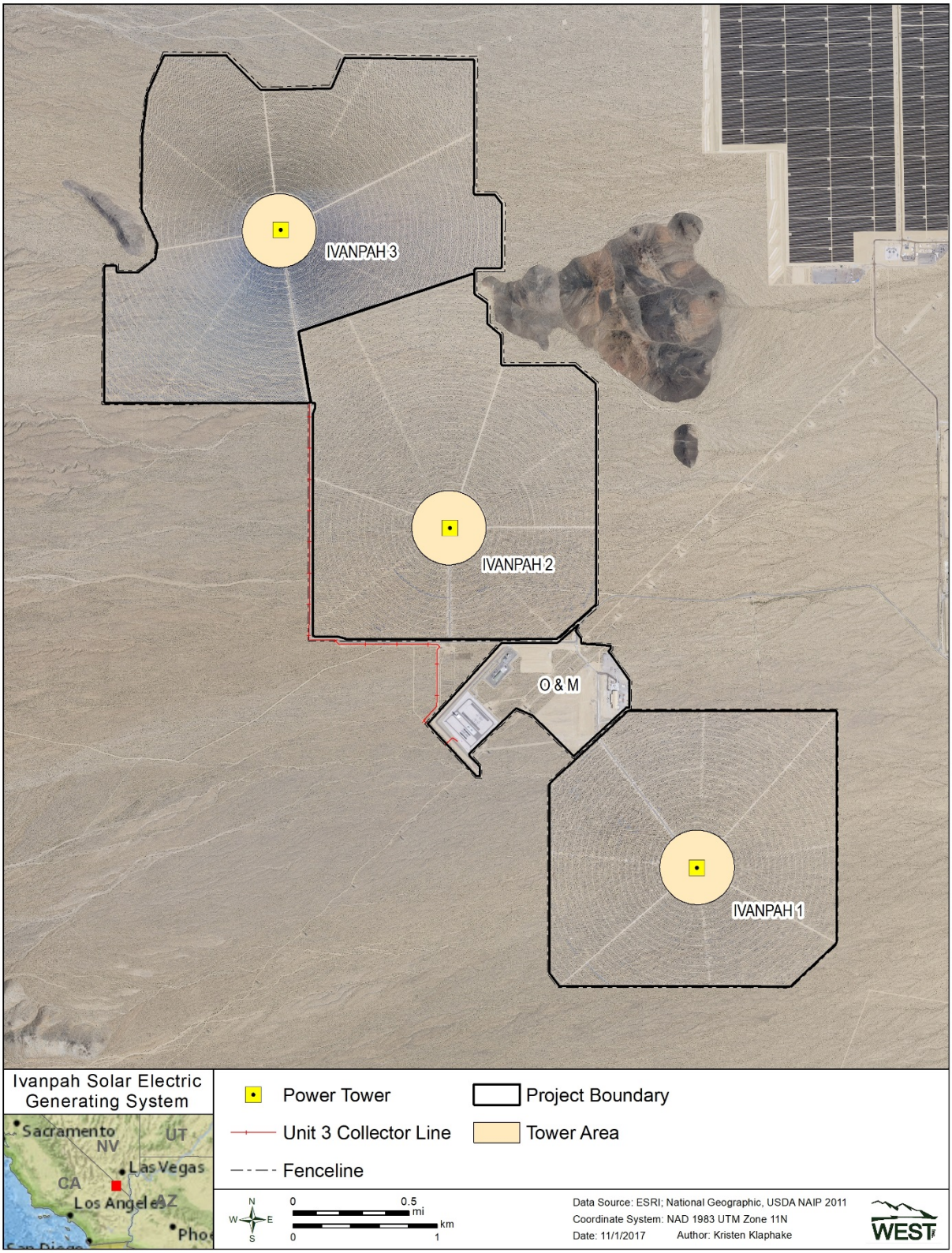

Figure 2. Ivanpah Search Areas.

2.1.1.2 Search Frequency and Timing

Consistent with the first three years of monitoring, standardized searches occurred at each unit on a nominal 7-day interval through the 2017 fall season. Variation in search interval and number of visits to each unit was anticipated to occur due to the transition between 21-day search and 7-day search interval between seasons of differing length, as well as the transition to Revision 13 of the Plan (2015), after November 15, 2015. The tower area of Units 1, 2 and 3 were visited a total of nine times.

2.1.1.3 Search Methods

Standardized walking surveys for fatalities were performed by biologists approved by CEC and BLM, in accordance with the methods outlined in the Plan (2015). Within the power block, biologists walked through and around the power tower and ACC unit looking for dead and injured birds and bats, and walked transects through the gravel surrounding the structures to achieve 100% coverage within physically accessible areas. Within the inner HD heliostats surrounding each power block, biologists walked transects to ensure 100% coverage. Thus, the tower area, comprising the area within 260 m of each tower, was completely covered during each survey, excepting any areas that were physically inaccessible or unsafe to survey. Inaccessible areas were, to the extent possible, scanned using binoculars.

Carcass and Feather Spot Examination. Every carcass and feather spot was examined visually by a biologist approved by the CEC and BLM for evidence of singeing or collision. Singeing to feathers can occur when a bird enters the flux around the power tower. When no obvious evidence of singeing or collision was evident to the naked eye, the carcass or feather spot was then examined using an AmScope SE306R-AZ-E2 20X-40X-80X Digital Binocular Stereo Microscope. When singed detections involving carcasses (as opposed to only feather spots) were found, the singeing was assigned a grade based on Kagan et al. (2014), as follows.

- Grade 1 – curling of less than 50% of the flight feathers
- Grade 2 – curling of 50% or more of the flight feathers
- Grade 3 – curling and visible charring of contour feathers

Kagan et al. (2014) originally found no singeing of contour feathers in the absence of curling of 50% or more of the flight feathers. In contrast, we have found singeing of contour feathers with curling of less than 50% of flight feathers, and in the absence of curling or singeing of any flight feathers. We therefore assigned grade 3 independent of grades 1 and 2.

When a carcass was detected, biologists looked for evidence of collision, including obvious physical trauma or detection adjacent to a heliostat with a bird-strike imprint, smudge mark, and/or feathers on or near the surface of the mirror. If there was no evidence of collision or singeing (e.g., charring, curling, or melting of feathers), as confirmed through microscopic examination, the cause of injury or fatality was listed as "unknown".

For the purpose of these surveys, feather spots were considered detections when they met the following definition:

> At least two or more primary flight feathers, 5 or more tail feathers, or 10 or more feathers of any type concentrated together in an area 1-m^2 or smaller (Smallwood 2007), without any bone, beak, or significant amounts of flesh or skin.

In some cases, an individual detection was broken up into aggregations of feathers that would meet the criteria for a feather spot, but with pieces of the carcass that contained bone or significant amounts of flesh or skin also present. In these cases, the detection was categorized as a partial carcass (rather than a feather spot), per the "feather spot" definition above.

2.1.2 Carcass Persistence Trials

Carcass persistence trials were performed throughout the 2017 fall monitoring season. A total of 10 small bird carcass trials were conducted. The TAC approved discontinuing large bird carcass trials at the conclusion of the 2015 summer season due to the consistency of large bird persistence times collected over the previous seasons. In response to the previous TAC request of increased sample size, the number of small bird trials was increased relative to the 2013 – 2014 winter monitoring season. Non-native house sparrows (*Passer domesticus*) and quail (*Coturnix sp.*) were used for small carcass trials conducted during the 2017 fall monitoring season. A camera was placed at each carcass to record the time of scavenging and the scavenging species.

2.1.3 Searcher Efficiency Trials

A total of 41 searcher efficiency trials (20 small birds, 10 large birds, and 11 feather spots) were conducted during the 2017 fall monitoring season. Trials were placed in the tower areas of all three units; however, no trials were placed in the ACC building since detection probability is assumed to be 100% in this area of the power block. Trial birds consisted of rock pigeons (*Columba livia*) and house sparrows (*Passer domesticus*), the latter of which were detections that were in good condition and repurposed for searcher efficiency trials. Each trial carcass was placed by a Designated Biologist (a biologist responsible for implementing the conditions of certification) prior to a scheduled search without knowledge of the searchers. For trial carcasses that were not detected by searchers, the Designated Biologist returned to the trial location to see if the trial carcass was still available to be found. If the trial carcass was absent, it was assumed to have been removed prior to the search, and thus not available to be detected.

Of the 41 trial carcasses placed, 34 (13 small carcasses, 10 large carcasses, and 11 feather spots) were available to be found; seven small carcasses were removed (scavenged) from the trial location before searchers had an opportunity to find them.

2.1.4 Incidental Reporting

Some detections were discovered outside standardized search areas, or were within search areas but not during standardized searches. Detections at locations not searched under the Plan (2015) such as the fenceline and heliostat areas of Unit 1, Unit 2, Unit 3, are considered incidental detections for this report. These detections were reported in accordance with the facility's Wildlife Incident Reporting System (described in Section 3.4 of the Plan) and were considered "incidental" detections. Data on these

incidental detections were reported in the SPUT permit database. As described in Section 2.1.5, incidental data could be included in the fatality estimates when they were found in areas covered during standardized surveys (e.g., tower area). Incidental detections from outside the survey areas were not included in the fatality estimates as discussed in Section 2.1.5; however, all detections regardless of the method or source of detection are reported in the SPUT permit database.

2.1.5 Fatality Estimator

Fatality rate estimation is a complex task due to several variables inherent to every fatality monitoring study. Carcasses may persist for variable amounts of time due to local scavenger activity or environmental conditions leading to carcass degradation over time. Carcasses and feather spots are also detected with varying levels of success based on carcass characteristics and ground cover. For these reasons, it is generally inappropriate to draw conclusions based on the raw number of fatalities alone. The desire to estimate fatalities given these variables has driven the development of several statistical methods for estimating fatalities (e.g., Smallwood 2007, Huso 2010, Korner-Nievergelt 2011). All of these fatality estimation methods share a similar underlying model. Generally, the fatality estimation for a given site may be written as:

$$F=C/rp,$$

where F is the total number of fatalities, C is the number fatalities detected and included in fatality estimation, r is the probability a carcass is unscavenged and available to be found at the end of the search interval, and p is the probability of detecting a carcass (Huso 2010).

The bias correction factors r and p are estimated by covariates that may influence the detectability and persistence of each carcass, such as carcass size, presence of vegetation, and stage of decay or scavenging (i.e., feather spot versus carcass). For this study, the Huso estimator was used to correct for detection and scavenging bias; the estimator was demonstrated to perform well under a variety of conditions (Huso 2010). The Huso model was developed in the context of estimating fatalities for post-construction fatality studies at wind energy facilities; however, the Huso estimator is suitable for other sources of anthropogenic avian mortality, including power lines and utility scale solar facilities (Huso 2010).

All fatality estimates were calculated using the Huso estimator, and 90% confidence intervals were calculated for each estimate using bootstrapping (Manly 1997). Bootstrapping is a computer simulation technique that is useful for calculating variances, and confidence intervals for complicated test statistics. A total of 1,000 bootstrap replicates were used. The lower 5th and upper 95th percentiles of the 1,000 bootstrap estimates provide estimates of the lower limit and upper limit of an approximate 90% confidence interval on all estimates.

Estimating Carcass Persistence Times. Measurement of carcass persistence time is often subject to censoring. In this context, censoring refers to the fact that a value (e.g., days a carcass is present before being removed) may not be known exactly, but within a finite range. For example, suppose a carcass was checked on day 7 and was present, and was checked again on day 10, but was found to be missing. The exact time until removal is unknown; however, it is known that the carcass was available to be found for between 7 and 10 days. This carcass would be considered "interval censored". Similarly, if a carcass lasts the entire six-week trial period, that carcass is "right censored"—we know the carcass lasted at least six

weeks, but it could have persisted longer. Due to the fact that camera traps (e.g., cameras that automatically document activity at the trial carcass) were used for carcass removal trials, the majority of scavenging times can be known precisely, and data are not censored. However, when cameras fail to record the moment of scavenging, trials are treated as interval censored between the last time the carcass was visible on the camera, and the earliest time at which it was known to be removed.

Survival regressions models are well-suited to accommodate censored carcass persistence data and are typically used to generate the average probability of persistence for fatality estimation (Huso et. al 2012). There are four commonly used distributions implemented in the survival models used to estimate the value of r : exponential, Weibull, loglogistic, and lognormal. These four distributions exhibit varying degrees of flexibility in order to model a wide variety of removal time distributions. Akaike's Information Criterion adjusted for sample size (AICc; Akaike 1973) was used to rank the fit of each survival model fit to carcass removal data. The exact time of death for detected fatalities is usually unknown, so the probability of persistence cannot be calculated exactly for each carcass; however, it can be estimated from the selected survival model and bootstrapped to obtain a range of estimates of r for each carcass.

Estimation and Model Selection for Searcher Efficiency. Searcher efficiency, or the proportion of carcasses detected, p, is represented most simply by the following equation:

$$p = \frac{Number\ of\ Trial\ Carcass\ Observed}{Number\ of\ Trial\ Carcasses\ Available}.$$

Searcher efficiency trials were conducted in all seasons. To evaluate various hypotheses regarding differences in carcass detectability among Project areas, seasons, and/or carcass size, logistic regression models were fit to searcher efficiency data and corrected Akaike's Information Criteria (AICc) was used to compare models. The data for this analysis included all human searcher efficiency trials of carcasses from the beginning of trials in the winter 2013 – 2014 season through the 2017 fall season.

Detection Bias Modeling Factors with Historical Data

Consistent with all previous seasonal and annual reports, detection bias modeling was performed using all trial data collected to date in *any* Project area. Using all historical data provides a larger, more robust data set resulting in more precise estimates of avian mortality. Although monitoring was not conducted in the heliostat area during the 2017 fall season, Project area was included as a covariate in the model selection process for searcher efficiency and carcass persistence bias based on vegetated (heliostat area) versus non vegetated (tower area). See previous seasonal and annual reports for additional details.

Fatality Estimates. Estimates for the number of detections in the tower area components (i.e., the power block and inner HD heliostats) are reported combined, because 100% of these areas were searched. The ACC buildings are only marginally accessible to scavengers from the outside; therefore, they act primarily as a closed system with a scavenging rate that approaches zero. Furthermore, carcasses are, generally, visible against the industrial backgrounds. Thus, the fatalities found in the ACC were not adjusted using the Huso estimator; rather, raw counts of ACC detections were added to fatality estimates for the power block. All detections within the ACC buildings are considered facility related, whether or not they showed evidence of singeing or collision.

Within the power block, during the 2017 fall season, incidental detections accounted for 14.5% of the detections recorded. Thus, as previously modeled, incidentals found within the power block were included in estimates, but treated differently from other fatalities. To reflect the high human activity in the power block—and frequent observation of the areas within the power block—the search interval for these detections was set to one day, consistent with all previous seasonal and annual reports (Table 1b).

In previous seasons, incidental detections found outside of the power block but within standardized search areas were partially processed in the field and left in place to give searchers the opportunity to discover the carcass on the next scheduled search. As approved by the TAC, this method was discontinued in the 2015 fall season to prevent the scenario where an incidental detection is recorded, left in place, but scavenged before the next standard search and no carcass is associated with the data. Beginning in the 2015 fall season and continuing to the present, incidental detections found outside of the power block, but within standardized search areas, were removed from field and included in fatality estimates under the conservative assumption that the search interval was the time between the last search of the area and the time of incidental discovery (Table 1b).

Table 1b. Treatment of Incidental Detections by Location

Location	Search Interval	Included in Analysis?
Power Block	1 Day	Yes, if carcass age is less than 24 hours
All Other Standardized Search Areas	Calculated days between date of detection and date of previous standard search in that location	Yes, if carcass age is less than calculated search interval

All fatality estimators have limitations, particularly when fatality counts are low. In particular, when detections are fewer than five, regardless of survey effort, estimates and confidence intervals can be unstable and must be interpreted with caution (Korner-Nievergelt et. al 2011). Rather than report estimates with little inferential value, no estimates were provided for combinations of covariates (e.g. size, location, cause) resulting in five or fewer detections.

The fatality estimator accounts for imperfect detection probability by using bias trials to estimate searcher efficiency. The Huso estimator is constructed under the assumption that searchers have a single opportunity to discover a carcass. Therefore, if a carcass is missed on the first search it was available and then found on the next search, it will effectively be over-counted. The method typically used to overcome multiple-detection-bias is to exclude any detection determined to be older than the search interval. Each detection made during the 2017 fall season was evaluated for exclusion from the estimator based on the observed time since death (i.e., the length of time between an animal's death and when the detection was discovered), and the search interval associated with that detection. For example, if a detection determined to have been on the ground for > 1 month was made in the inner HD of Unit 2, which had been searched seven days earlier, that carcass would be excluded from analysis.

Determining the age of a carcass was based on detailed qualitative analysis of every detection (carcasses and feather spots) recovered onsite. Qualitative analysis began with in situ aging analysis in the field by biologists approved by the CEC and BLM, followed by a more detailed analysis in the lab. In the field, biologists noted the presence of rigor mortis, condition of eyes and feathers, and condition of blood or

viscera (if present). In the lab, each carcass was further examined and compared to photographs of decomposed test carcasses. The test carcasses were used to document decomposition over time at Ivanpah to better inform biologists of site-specific characteristics of avian decomposition that could be expected at the Project.

Decomposition test carcasses were placed in tamper-proof containers, exposed to onsite environmental conditions, and allowed to decompose. Carcasses used in decomposition tests were placed to account for variation in space (e.g. underneath fans in the ACC unit versus shaded under a heliostat) and time (e.g. ephemeral weather patterns). As the test carcasses aged, the biologists photographed and recorded the condition of body tissue and fluids, eyes, feathers, and indications of rigor mortis. All decomposition specimens were placed during the 2015 spring monitoring season.

To correctly account for searcher efficiency in the fatality estimate model, when partial carcasses are initially identified as feather spots by the observer in the field, they are modeled (in the fatality estimates) as a feather spot. In other words, the primary means of identification of the detection (feather spot, small carcass, or large carcass) is the appropriate classification to utilize in the modeled estimates. The primary identification approach is appropriate since different searcher efficiency rates are estimated for feather spots as opposed to carcasses. Because searcher efficiency is an important component of the fatality estimator, what the surveyors detect first (i.e., feather spot versus a complete or partial carcass) influences how that detection should be included in the model. Such detections are noted in Appendix A as "partial carcass + feather spot" in the "Description of Carcass/Injury" column.

2.2 Deterrence Measures

2.2.1 Avian Measures

Ivanpah commenced an investigation of the use of various deterrence measures to reduce avian mortality at the facility in 2013. These initial investigations combined with the results of the monitoring conducted during 2014 resulted in a list of potential deterrence measures for adaptive management. As monitoring has identified patterns of detections, additional measures have been identified, tested and ultimately deployed as part of the adaptive management program.

Several deterrence measures have been tested and, implemented for birds at Ivanpah. Specifically, new ground-level LED lighting and spikes were installed at Unit 1 on 5 February 2015. As approved by the TAC, after initial testing, a chemosensory deterrence measure commercially known as BirdBuffer, was deployed on 12 October 2014 at Unit 1, and a sonic deterrence measure commercially known as BirdGard, was deployed on 13 March 2015 at Unit 1. Bird Buffer was installed at Unit 2 and Unit 3 on 29 September 2015; BirdGard was installed at Unit 2 on 25 August 2015 and Unit 3 on 31 August 2015. The chemosensory deterrence measure is hypothesized to deter resident species, since the deterrent induces a conditioned response over time, and the sonic deterrence measure is hypothesized to deter transient and migrant species, as the sounds produced by the system are thought to startle and deter subjects. Together, the combination of BirdBuffer and BirdGard systems are intended to deter avian species from entering this area associated with elevated flux mortality.

Enhancements to BirdBuffer were designed in fall 2016 and implemented in early March of 2017. Enhancements included replacing the single output device at each Unit tower with two double output devices at each Unit tower. Enhancements to BirdGard were designed in fall 2016 and implemented in February of 2017. The enhancements included upgrading each speaker device containing 20 speakers to a new speaker device which combines 3 separate speaker towers containing 21 speakers. Each speaker tower has 7 hyper-directional speakers, for a total of 21 directional speakers targeted towards a specific path. The four independent three-speaker-devices will remain positioned on the north, east, south, and west side of each tower area.

In addition to the measures above and based on the location of greater roadrunner (*Geococcyx californianus*) detections along the fenceline and observations of hawks trapping greater roadrunner against the fence, an adaptive management measure was developed by the facility in 2016 to allow roadrunners to escape through the unit fence. The measure deployed consisted of installing egress routes through the fence with an elevated platform. The elevated platform allows the egress route to be installed without impacting the desert tortoise fencing. The shade cloth was installed to increase visibility of the egress route. The measure was initially tested at Unit 1 and monitored with a game camera. Evidence of roadrunners use was captured on camera, and this measure is now considered a best management practice and 17 additional egress routes were installed along fences for the remaining units during 2017.

2.2.2 Bat Measures

Bat fatalities were detected primarily in the ACC, and as the ACC provides a roosting location, a Binary Acoustic Technology Ultrasonic Bat Deterrence was tested at Unit 3. The bat deterrence measure is not designed to elicit a fear response in bats, but is designed to interfere with the echolocation capabilities of bats. As bats navigate utilizing sonar, the method deployed "jams" the sonar signals and bats species avoid the area as a result of the inherent difficulties to navigate under these conditions. Although bats can adjust echolocation under jamming conditions, the use of broadband ultrasound requires bats to shift frequencies to avoid overlap that interferes with echolocation and therefore deters within the area subject to broadband ultrasound (Arnett, et al, 2013). As a result of the broadband ultrasonic signal and the inherent "jamming" effect, adaptation to the deterrence measure is minimal. The deterrence measure has been tested and installed at all Units, and the installation dates are as follows: 10 September 2014 at Unit 1, 23 April 2015 at Unit 2, and 23 April 2015 at Unit 3. In November 2015, an ultrasonic testing protocol was implemented to ensure proper function of all deterrence units. The testing of each deterrence device occurs monthly, with a contractor using a lift to access the space approximately 15 feet from each installed deterrence device. An ultrasonic sound detector is then used to determine if each individual deterrence device is functioning properly. A record is maintained of each inspection.

Section 3.0 Monitoring Results

3.1 Summary of Avian Detections

The average search interval in the tower area was 8.6 days (range 5 to 23, median 7.0 days) during the 2017 fall season for the three solar units. Variation in search interval was anticipated to occur due to the transition between 7-day and 21-day search intervals associated with seasons of differing length.

During the 2017 fall season, a total of 264 avian detections (including injured birds and incidentals) of 49 identified species (Table 2) were recorded. Approximately 66% of species detected were songbirds, with 9% being other known bird types; 25% could not be identified to an appropriate level. The most numerous detection of an identified species was yellow warbler followed by yellow-rumped warbler. Almost all detections occurred in the tower area (Figures 3, 4, 5, and 7), where approximately 154 acres were surveyed, representing 100% of the total tower area.

Table 2. Number of Individual Bird Detections, by Species, 2017 Fall Season.

Species	Scientific Name	Injuries	Fatalities	Songbird?
unidentified bird (small)	*unidentified*	0	65	NA
yellow warbler	*Setophaga petechia*	0	22	Yes
yellow-rumped warbler	*Setophaga coronata*	0	21	Yes
unidentified swallow	*unidentified*	0	11	Yes
unidentified warbler	*unidentified*	0	10	Yes
brown-headed cowbird	*Molothrus ater*	0	9	Yes
chipping sparrow	*Spizella passerina*	0	6	Yes
northern rough-winged swallow	*Stelgidopteryx serripennis*	0	6	Yes
unidentified sparrow	*unidentified*	0	6	Yes
Nashville warbler	*Oreothlypis ruficapilla*	0	5	Yes
violet-green swallow	*Tachycineta thalassina*	0	5	Yes
Brewer's sparrow	*Spizella breweri*	0	4	Yes
house finch	*Haemorhous mexicanus*	0	4	Yes
northern mockingbird	*Mimus polyglottos*	0	4	Yes
Wilson's warbler	*Cardellina pusilla*	0	4	Yes
black-throated sparrow	*Amphispiza bilineata*	0	3	Yes
lazuli bunting	*Passerina amoena*	1	3	Yes
orange-crowned warbler	*Oreothlypis celata*	0	3	Yes
rufous hummingbird	*Selasphorus rufus*	0	3	No
Townsend's warbler	*Setophaga townsendi*	0	3	Yes
tree swallow	*Tachycineta bicolor*	0	3	Yes
unidentified woodpecker	*unidentified*	0	3	No
white-crowned sparrow	*Zonotrichia leucophrys*	0	3	Yes
black-tailed gnatcatcher	*Polioptila melanura*	0	2	Yes

Species	Scientific Name	Injuries	Fatalities	Songbird?
black-throated gray warbler	*Setophaga nigrescens*	0	2	Yes
blue-gray gnatcatcher	*Polioptila caerulea*	0	2	Yes
Bullock's oriole	*Icterus bullockii*	0	2	Yes
hermit warbler	*Setophaga occidentalis*	0	2	Yes
house wren	*Troglodytes aedon*	0	2	Yes
Savannah sparrow	*Psandwichensis*	0	2	Yes
unidentified bird	*unidentified*	0	2	NA
unidentified grebe	*unidentified*	0	2	No
unidentified hummingbird	*unidentified*	0	2	No
verdin	*Auriparus flaviceps*	0	2	Yes
western tanager	*Piranga ludoviciana*	0	2	Yes
white-throated swift	*Aeronautes saxatalis*	0	2	No
American kestrel	*Falco sparverius*	0	1	No
bank swallow	*Riparia riparia*	0	1	Yes
barn swallow	*Hirundo rustica*	0	1	Yes
Bewick's wren	*Thryomanes bewickii*	0	1	Yes
black-headed grosbeak	*Pheucticus melanocephalus*	0	1	Yes
cliff swallow	*Petrochelidon pyrrhonota*	0	1	Yes
Cooper's hawk	*Accipiter cooperii*	1	1	No
fox sparrow	*Passerella iliaca*	0	1	Yes
green-tailed towhee	*Pipilo chlorurus*	0	1	Yes
lark sparrow	*Chondestes grammacus*	0	1	Yes
lesser goldfinch	*Spinus psaltria*	0	1	Yes
mourning dove	*Zenaida macroura*	1	1	No
pine siskin	*Spinus pinus*	0	1	Yes
red-breasted nuthatch	*Sitta canadensis*	0	1	Yes
rose-breasted grosbeak	*Pheucticus ludovicianus*	0	1	Yes
ruby-crowned kinglet	*Regulus calendula*	0	1	Yes
Swainson's thrush	*Catharus ustulatus*	0	1	Yes
unidentified accipiter	*Accipiter spp*	0	1	No
unidentified blackbird	*unidentified*	0	1	Yes
unidentified duck	*unidentified*	0	1	No
unidentified finch	*unidentified*	0	1	Yes
unidentified flycatcher	*unidentified*	0	1	Yes
unidentified gnatcatcher	*Polioptila spp.*	0	1	Yes
unidentified teal	*Anas spp*	0	1	No
vesper sparrow	*Pooecetes gramineus*	0	1	Yes
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	0	1	Yes
eared grebe	*Podiceps nigricollis*	1	0	No

Species	Scientific Name	Injuries	Fatalities	Songbird?
rock pigeon	*Columba livia*	2	0	No
Total		6	258	NA*

*NA – Not Applicable

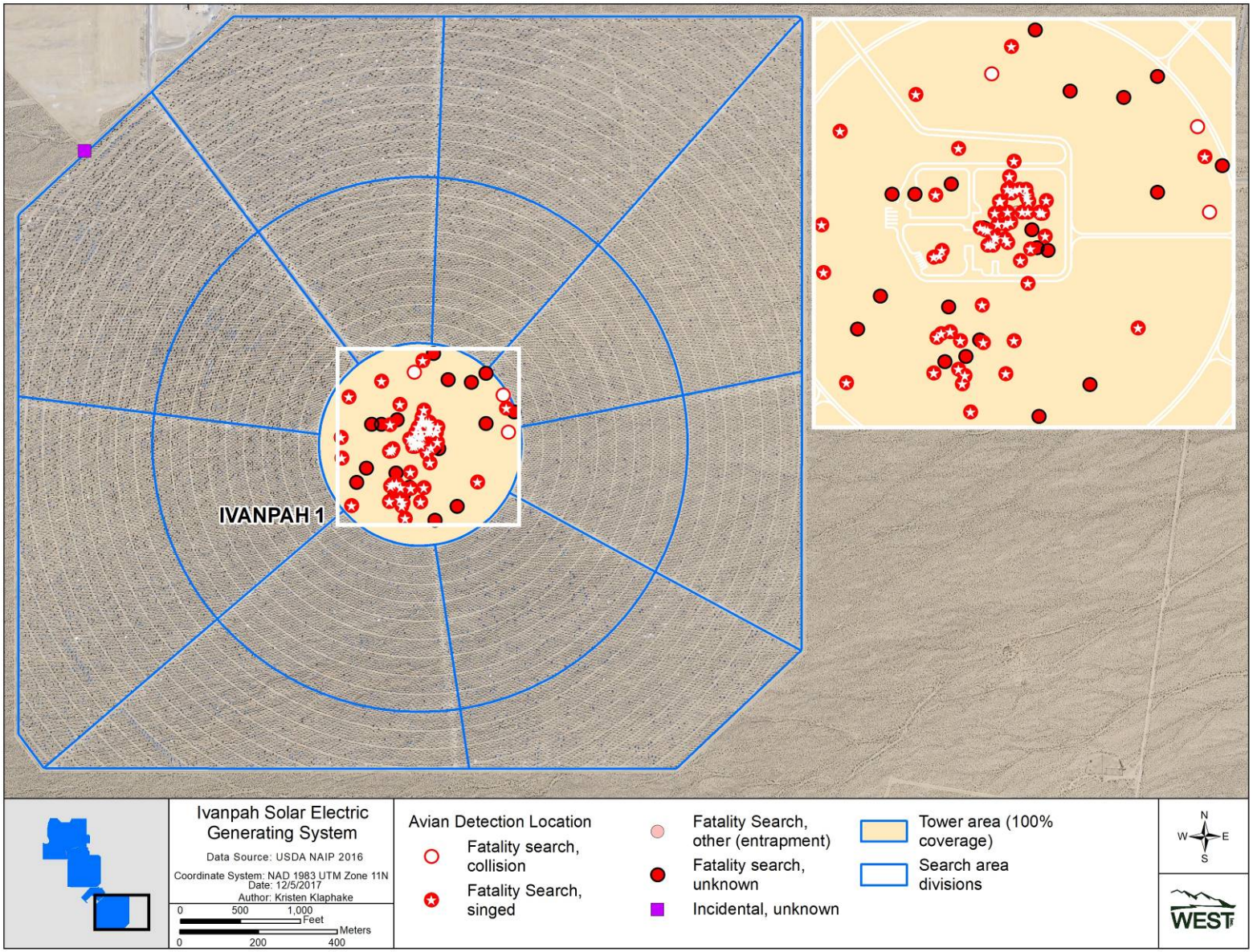

Figure 3. Ivanpah 1 Detections.

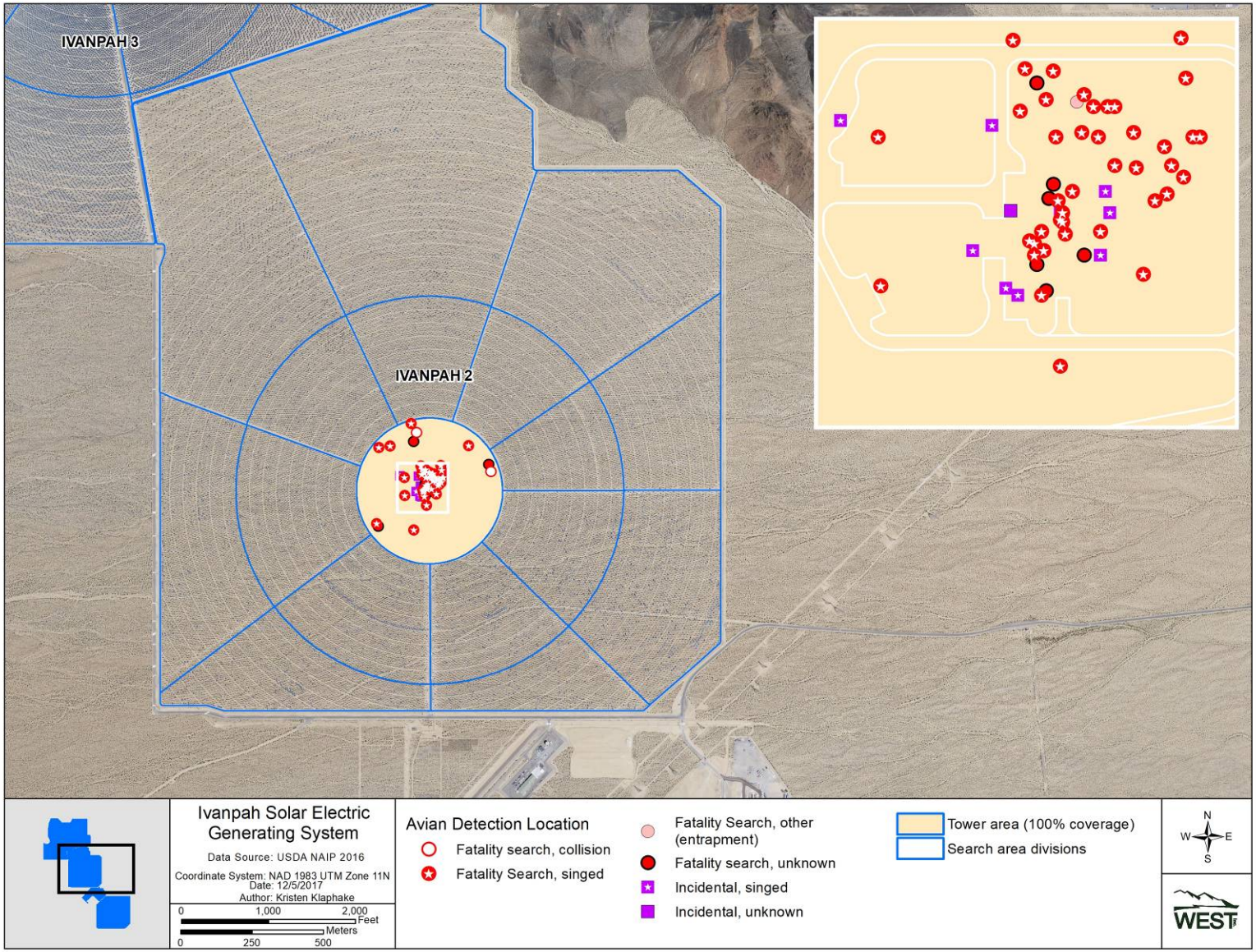

Figure 4. Ivanpah 2 Detections.

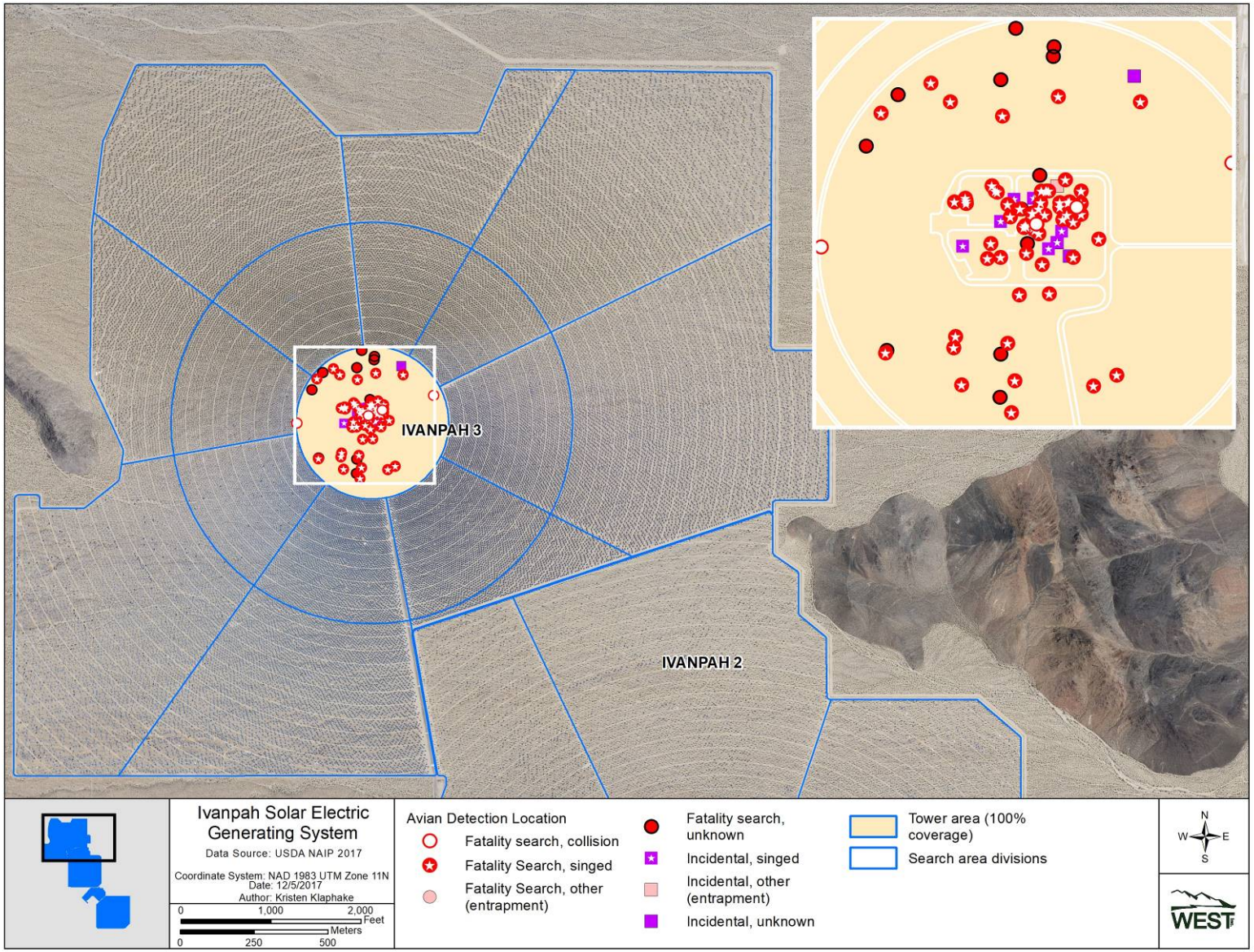

Figure 5. Ivanpah 3 Detections.

3.1.1 Temporal Patterns of Avian Detections

The number of detections reported per day was relatively consistent throughout the 2017 fall season with the largest peak on October 18 (Figure 6). The number of detections per day represents the accumulation of detections over the search interval minus those detected incidentally and removed between searches. Thus, to better understand the temporal patterns, the number of detections reported per day were plotted for the tower area (Figure 6).

Data from BirdCast suggests that the 2017 fall season captured the majority of the period of fall migration (CLO 2017). Thus, there is potential for fall migration to have extended beyond the fall monitoring season, and biologically-informed seasonal analysis conducted for the annual report will capture extended migration. The BirdCast West regional migration summaries were available from 26 August – 21 October 2017 with several weeks missing analysis. During the 2017 fall season, movements were described as light to moderate in California and Desert Southwest each week with locally moderate movements noted for October 13 – 20.

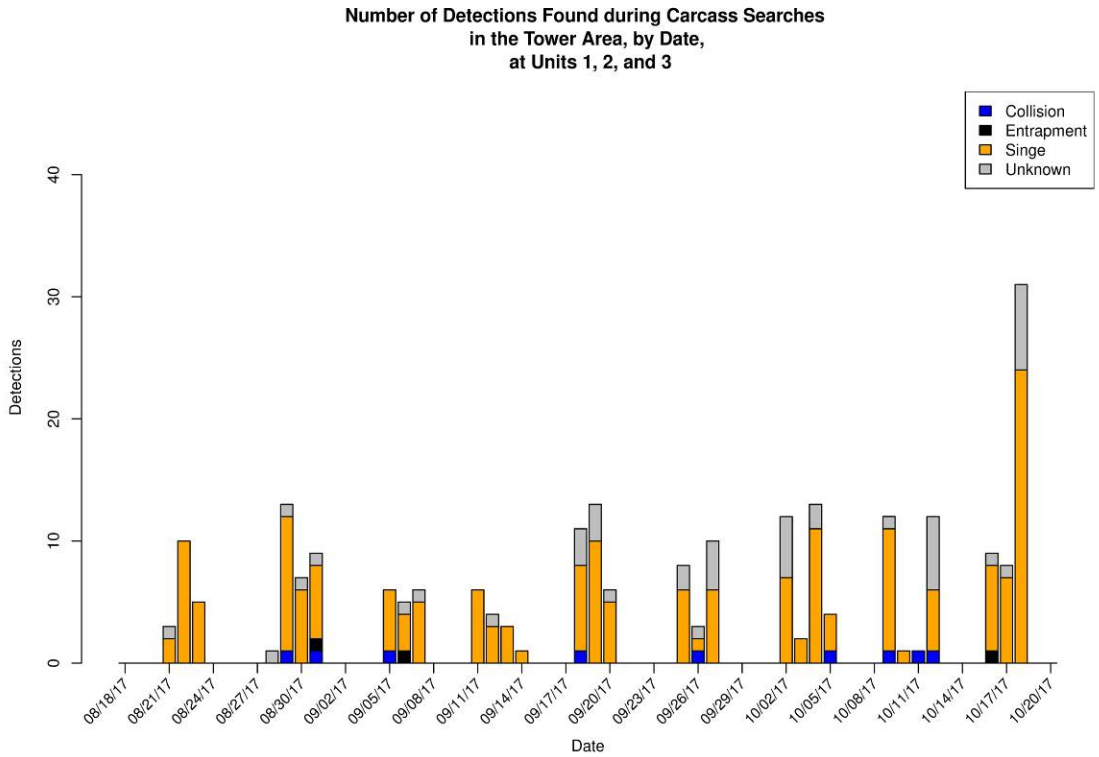

Figure 6. Number of Detections on Each Survey Date, 18 August 2017 - 20 October 2017.

Six birds were alive when detected during the 2017 fall season (Table 3) consisting of two injured rock pigeons transported to the Animal Kingdom Veterinary Hospital; one lazuli bunting taken to Animal Kingdom Veterinary Hospital that was ultimately released in good health; an uninjured mourning dove that flew off after being released the same day; an eared grebe that was released at golf course pond; and one Cooper's hawk that died after being taken to the Animal Kingdom Veterinary Hospital.

Table 3. Avian Injuries Detected 18 August 2017 - 20 October 2017.

Date	Species	Age	Sex	Cause of Injury	Flux Grade	Status
8/22/2017	rock pigeon	Unknown	Unknown	singed	2	Brought to rehab
8/26/2017	lazuli bunting	Unknown	Unknown	singed	2	Released at rehab
8/30/2017	mourning dove	Immature	Unknown	unknown	NA	Released on-site
9/12/2017	rock pigeon	Unknown	Unknown	singed	2	Brought to rehab
9/27/2017	eared grebe	Unknown	Unknown	unknown	NA	Released at golf course pond
10/7/2017	Cooper's hawk	Adult	Unknown	unknown	Unk	Died at rehab

*NA – Not Applicable

3.1.2 Summary of Bat Detections

Seven bats representing three species and three unidentified species were detected as fatalities during the 2017 fall season. One canyon bat (*Parastrellus hesperus*), one unidentified Myotis, and one Yuma bat (*Myotis yumanensis*) were located in the Unit 1 ACC building; two unidentified bats were located in the Unit 2 ACC building; one Mexican free-tailed bat (*Tadarida brasiliensis*) was located in the Unit 3 powerblock; and an unidentified bat was located in the Unit 3 ACC building. Given the few detections of bats, they are not discussed further.

3.2 Locations of Avian Detections

3.2.1 Detections by Project Area

During the 2017 fall surveys, 263 detections (99.6%) of the 264 total detections were recorded at the tower area and one detection (0.4%) was recorded incidentally outside of the tower area (Table 4). Of the 264 avian detections, 95 (36.0%) were detected in Unit 1, 72 (27.3%) in Unit 2, and 97 (36.7%) in Unit 3.

Table 4. Locations of Avian Detections, 18 August 2017 - 20 October 2017.

Location	Carcasses	Injuries	Percent of Total
Tower Area	258	5	99.6
Outside of Tower Area	0	1	0.4
Total	258	6	100

3.3 Cause of Injury or Fatality

The following section describes the number of detections with evidence of singeing or collision; the number from other known causes; the number for which cause of injury or fatality is unknown; and the spatial distributions of detections with these causes. Figure 7 shows the distribution of detections by cause.

3.3.1 Singeing Effects

Of the 264 avian detections during the 2017 fall season, 201 detections (76.1%) showed signs of singed feather damage, and all were detected in the tower area (Table 5).

3.3.2 Collisions

Of the 264 avian detections, evidence of collision was observed in nine (3.4%), all of which were detected in the tower area. As described in Section 2.1.1.3, the evidence that was used to classify these detections as collisions was obvious physical trauma, proximity to heliostats that had smudge marks, body imprints, and/or feathers on or near the surface of the mirror (although birds that collide with structures do not always leave visible evidence).

Table 5. Locations of Bird Detections, 18 August 2017 - 20 October 2017.

Location	Singed	Collision	Other*	Unknown	Total
Tower Area	201	9	4	49	263
Outside of Tower Area	0	0	0	1	1
Total	201	9	4	50	264

* Entrapped in ACC

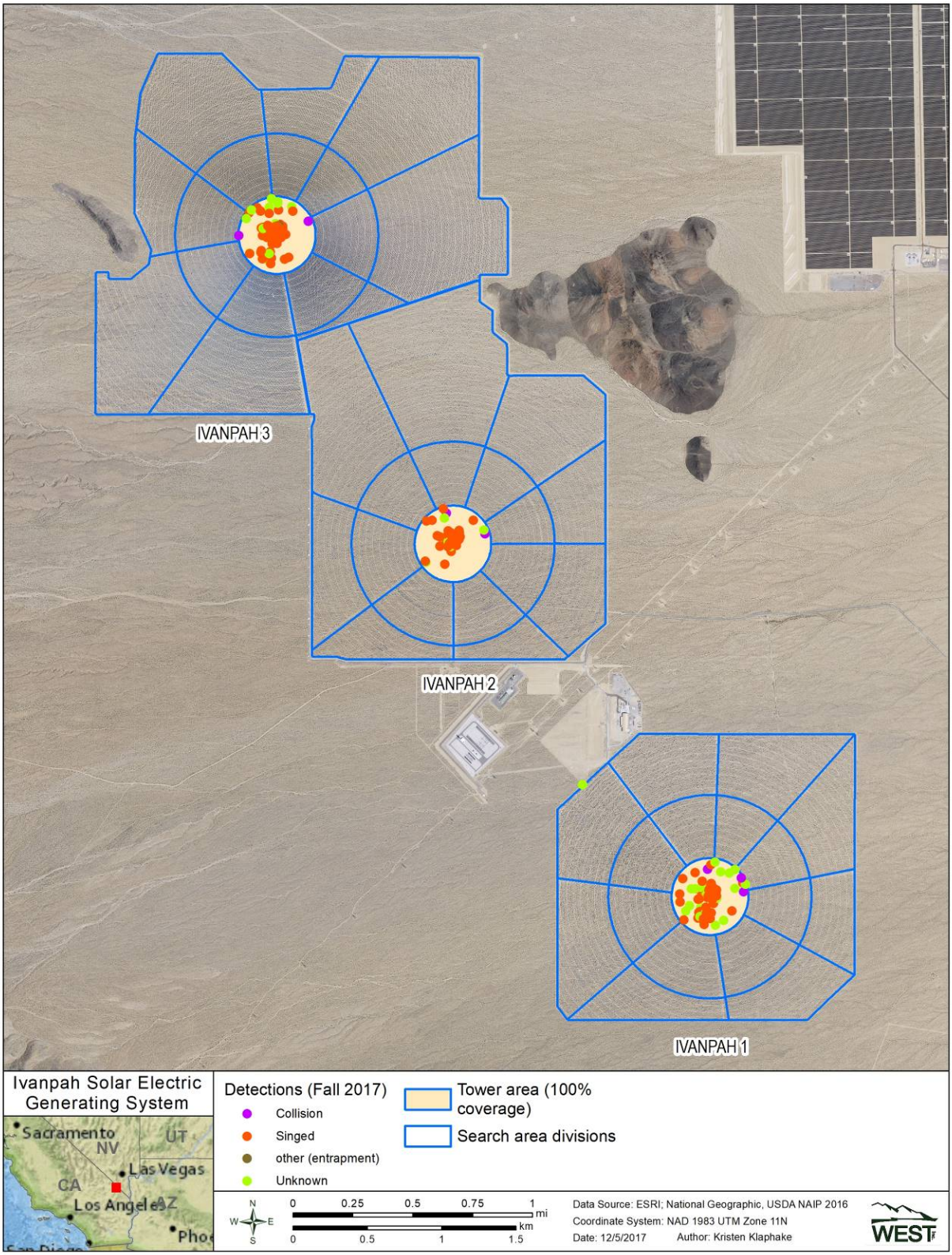

Figure 7. Locations of Singed and Unsinged Detections within Solar Units.

3.3.3 Other Cause

Of the 264 avian detections, four (1.5%) were found within the ACC with no evidence of singeing or collision. Thus, consistent with previous cause assignments, these birds were determined to have been entrapped in the ACC, which resulted in fatality.

3.3.4 Detections of Unknown Cause

Of the 264 avian detections, evidence of singeing, collision, or other cause could not be assigned for 49 detections within the tower area (18.6%; Table 5). Cause could not be assigned for one detection (0.4%) found outside of the tower area. Per the Plan section 2.1, these detections cannot be presumed with or presumed without a reasonable doubt to be caused by the facility; see Section 6.2 of this report for further discussion. These detections showed no evidence of collision effects, and microscopic analysis did not indicate signs of singeing. Of these 50 unknown detections, 26 (52%) were feather spots, 15 (30%) broken-up carcasses that had been scavenged, seven (14%) were whole carcasses, and two were injured (4%).

3.4 Types of Detections

One hundred thirty-eight (52.3%) of the 264 detections were feather spots or partial carcasses (Table 6a). Feather spots/partial carcasses accounted for 52.5% of detections in the tower area. Evidence of singeing was noted through direct and microscopic examination on 95 of these 138 feather spots; evidence of collision (i.e., an impact imprint on a nearby mirror) was noted in the case of three feather spots. Otherwise, the causes of the feather spots for the other 40 detections are unknown (Table 6b).

Table 6a. Percent Composition Feather Spots to Carcasses Relative to Site Locations.

Location	Carcasses	Feather Spots/Partial Carcasses	Total Detections	Percent Feather Spot*
Tower Area	125	138	263	52.5%
Outside of Tower Area	1	0	1	0
Total	126	138	264	52.3%

*Percent feather spot is total feather spots/partial carcasses divided by total detections.

Table 6b. Percent Composition Feather Spots to Carcasses Relative to Cause.

Cause	Carcasses	Feather Spots/Partial Carcasses	Total Detections	Percent Feather Spot*
Singed	106	95	201	47.3%
Unknown	10	40	50	80%
Collision	6	3	9	33.3%
Other**	4	0	4	0
Total	126	138	264	52.3%

*Total percent feather spot is total feather spots divided by total detections.

**Entrapped in ACC.

Section 4.0 Fatality Estimation

This section utilizes the detection data as described in Section 3 to develop a fatality estimate in accordance with the Plan (2015) for the tower area.

4.1 Estimating Model Parameters

4.1.1 Carcass persistence Trials

A total of 10 small bird carcass persistence trials were conducted during the 2017 fall monitoring season in the tower area. Consistent with previous seasons, scavengers included common ravens (*Corvus corax*, N=5), and desert kit fox (*Vulpes macrotis*; N=4). In one instance no scavenger was recorded on camera. Small bird carcass persistence ranged from less than one day in the case of seven carcasses, to just over two days for one carcass (Figure 8). Large bird carcass persistence trials were discontinued beginning fall 2015 per TAC approval because no seasonal effects were found in previous large bird models and most trial carcasses persisted at least 42 days (Figure 9).

In addition to the 2017 fall trials described above, small bird carcass persistence trials from the first three years and the winter, spring and summer seasons of the fourth year of monitoring were also used in the model. Carcass persistence data from 50 small bird carcass persistence trials conducted during the 2016 - 2017 winter and 2017 spring and summer seasons, 92 carcass persistence trials conducted during the 2015 - 2016 monitoring year (92 small birds distributed throughout the facility), carcass persistence data from 127 carcass persistence trials conducted during the 2014 - 2015 monitoring year (97 small birds and 30 large birds distributed throughout the facility), and data from 87 trials (57 small birds and 30 large birds distributed throughout the facility) performed during the first year of monitoring (29 October 2013 – 20 October 2014) were used to model carcass persistence time. Details on carcass persistence times can be found in each respective seasonal report.

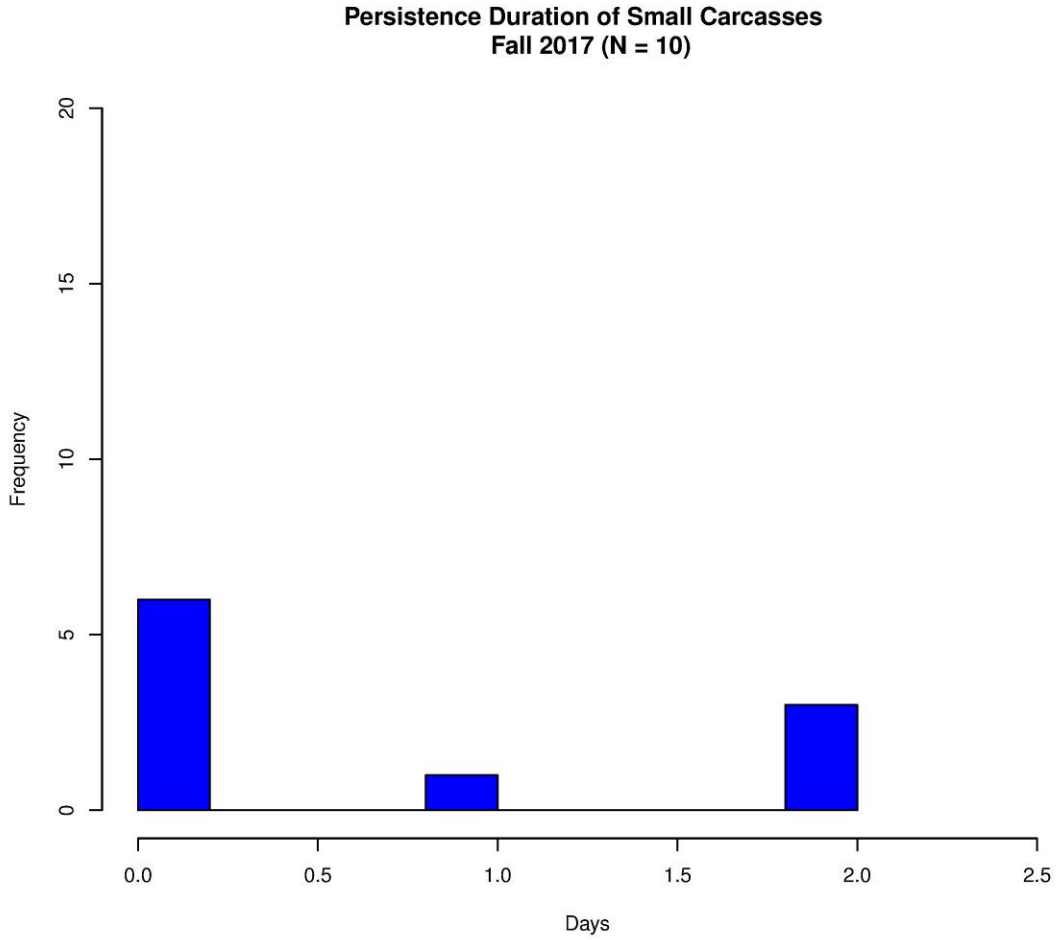

Figure 8. Persistence Durations for Small Carcasses Placed for 2017 Fall Carcass Persistence Trials (N = 10).

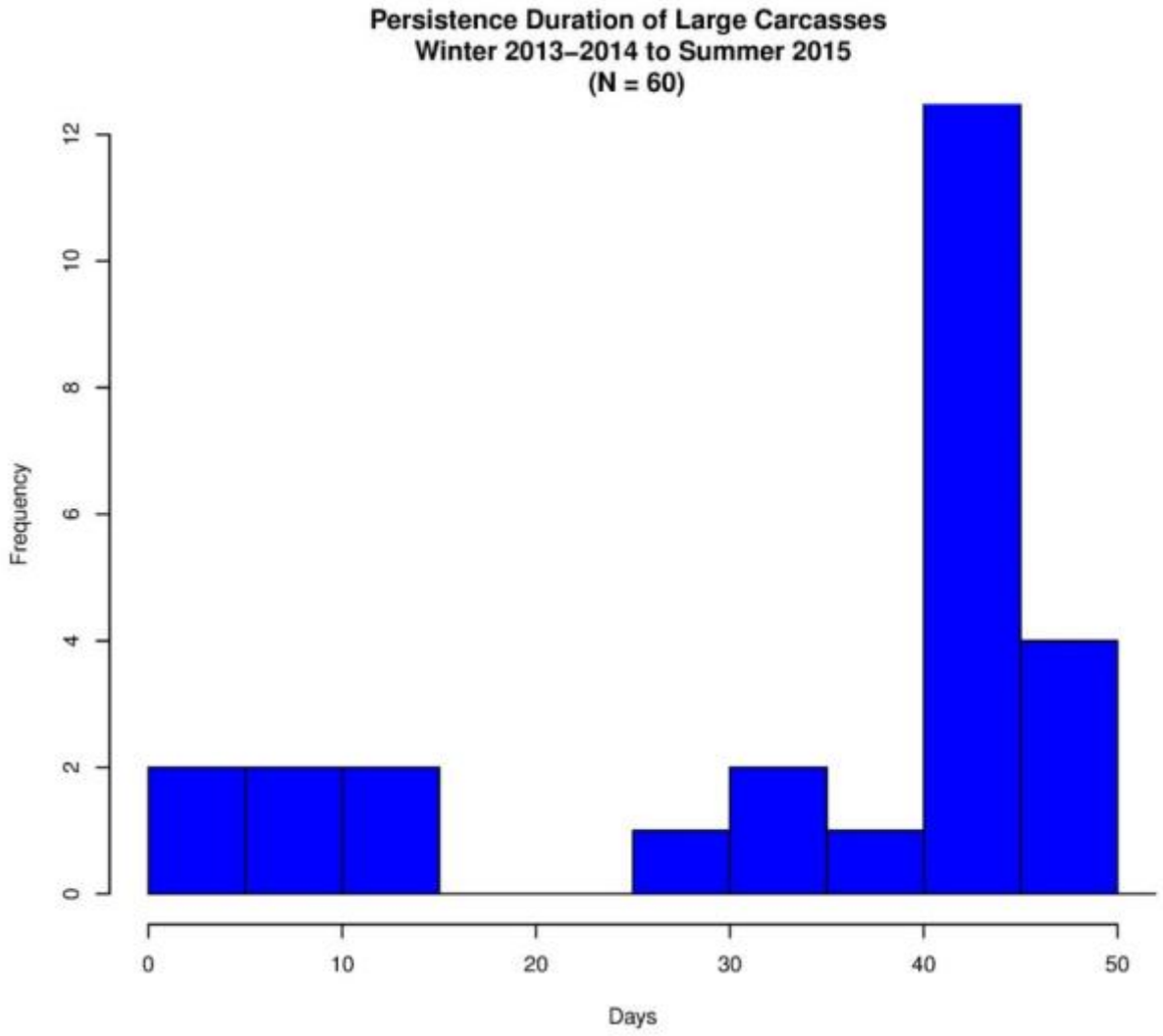

Figure 9. Persistence Durations for Large Carcasses Placed for All Carcass Persistence Trials.

4.1.2 Model Selection for Carcass Persistence Distribution

Consistent with the findings that the removal process for small birds and large birds has been markedly different, two separate carcass persistence models were fit to this dataset: one for small birds and one for large birds. Specifically, large birds consistently persist for long periods of time (typically greater than six weeks), while small birds tend to be removed with days or hours, and exhibit seasonal variability. Fitting separate models by size allows for more flexibility, enabling different distributions with different shapes to be fit to the small bird and large bird data, respectively.

Based on the carcass persistence data from the cumulative trials, 24 survival models were compared for the small bird and large bird datasets, respectively. Models were compared for relative explanatory power using the corrected Akaike information criterion (AICc) score (Akaike 1973), as suggested in Huso (2010). AICc provides a relative measure of model fit and parsimony among a selection of candidate models. Season was considered as a possible covariate due to cyclical variation in scavenging pressure and environmental conditions associated with seasons. Year was also incorporated as a covariate to

assess whether respective seasons could be pooled across the first four years (i.e. combine 2014 fall with 2015 fall, 2016 fall, and 2017 fall persistence trial results). Finally, Project area was also included in all models to evaluate whether or not carcass persistence differed by Project area using the full 16 quarter carcass persistence trial dataset.

The model with lowest AICc is typically chosen as the "best-fit" model relative to other models tested; however, any model within two AICc point of the best model is considered strongly supported (Burnham and Anderson 2004). For small birds three loglogistic models had ΔAICc values ≤ 2: Year+Season, Year+Season+Year*Season, and Season+Year+Project Area. For large birds the exponential, Weibull, loglogistic, and lognormal models with intercept only had ΔAICc values ≤ 2 (Tables 7a and 7b). Ultimately, a loglogistic model with the Year+Season covariate was chosen for small birds, and an exponential model with no covariates was chosen for large birds. Thus, the selected model for small birds can be interpreted to estimate a different persistence probability for each season and year, for a given search interval. For large birds, the top model does not have any temporal or spatial covariates, and thus estimates of probability of persistence for large birds are based on search interval only. The chosen models predicted 98.8% of large carcasses persisted for the nominal search interval (7 days), and 25.5% of small bird carcasses persisted for the nominal search interval of during the 2017 fall monitoring season.

Table 7a. AICc Values for the Top 12 Small Bird Carcass Persistence Models

Small Bird Trials			
Covariates	Distribution	AICc	Δ AICc
Year + Season	loglogistic	1460.39	0
Year + Season + Year*Season	loglogistic	1462.08	1.69
Season + Year + Project Area	loglogistic	1462.11	1.72
Year + Season	lognormal	1464.34	3.95
Season + Year + Project Area	lognormal	1466.12	5.73
Year + Season + Year*Season	lognormal	1467.62	7.23
Season	loglogistic	1469.95	9.56
Season + Project Area	loglogistic	1469.96	9.57
Season	lognormal	1472.35	11.96
Season + Project Area	lognormal	1472.61	12.22
Year + Season	weibull	1472.73	12.34
Season + Year + Project Area	weibull	1474.48	14.09

Table 7b. AICc Values for the Top 12 Large Bird Carcass Persistence Models

Large Bird Trials			
Covariates	Distribution	AICc	Δ AICc
Intercept	exponential	97	0
Intercept	weibull	97.96	0.96
Intercept	loglogistic	98.03	1.03
Intercept	lognormal	98.15	1.15
Year + Season	exponential	101.15	4.15
Year + Season	lognormal	101.42	4.42
Season	exponential	101.48	4.48
Year + Season	loglogistic	102.22	5.22
Season	lognormal	102.38	5.38
Year + Season	weibull	102.6	5.60
Season	loglogistic	102.7	5.70
Season	weibull	102.73	5.73

4.1.3 Searcher Efficiency Trials

During the 2017 fall season, a total of 41 searcher efficiency trials (20 small birds, 10 large birds, and 11 feather spots) were placed in the tower areas of Units 1, 2, and 3. Seven small birds were removed (scavenged) prior to a searcher having the opportunity to detect the carcass.

Trial data from the first three years of monitoring, and the winter, spring, and summer seasons of year four, were used to fit a searcher efficiency model for the 2017 fall season. Of the 74 (22 small birds, 29 large birds, and 23 feather spots) trials placed in the 2016-2017 winter season, 60 (20 small birds, 20 large birds, 20 feather spots) were available to be found; of the 65 (23 small birds, 22 large birds, 20 feather spots) trials placed during the 2017 spring season, 62 (22 small birds, 20 large birds, and 20 feather spots) were available to be found; and of the 34 (14 small birds, 9 large birds, 11 feather spots) trials placed during the 2017 summer season, 26 (8 small birds, 7 large birds, and zero feather spots) were available to be found. Of the 306 human searcher efficiency trials conducted during the 2015-2016 monitoring year (124 small birds, 93 large birds, and 89 feather spots), 263 (95 small carcasses, 83 large carcasses, and 85 feather spots) were available to be found; 43 carcasses (29 small carcasses, 10 large carcasses, and 4 feather spot) were removed from the trial location before searchers had an opportunity to detect the carcass. Of the 320 human searcher efficiency trials conducted in the 2014 – 2015 monitoring year (129 small birds, 96 large birds, and 95 feather spots), 268 (129 small carcasses, 96 large carcasses, and 95 feather spots) were available to be found; 52 carcasses (42 small carcasses, 8 large carcass, and 2 feather spots) were removed from the trial location before searchers had an opportunity to detect the carcass. An additional 154 searcher efficiency trials from the first year of study (2013 – 2014) were also included in searcher efficiency model building. Of 154 trials from the first year of monitoring, 144 were not removed and thus available to be found by a searcher.

Based on the trials conducted during the 2017 fall season (only) in the unvegetated tower areas, searcher efficiency was 77% for small birds, 90% for large birds, and 91% for feather spots.

Table 8. Covariates, AICc Values, and ΔAICc values for the top ten searcher efficiency models. Data consist of all human searcher efficiency trials for carcasses from the initiation of trials through 17 October, 2017.

Covariates	AICc	Δ AICc
Size + Project Area + Year + Size*Project Area + Size*Year	1005.84	0.00
Size + Project Area + Year	1006.02	0.18
Size + Project Area + Year + Size*Project Area	1007.00	1.16
Size + Project Area + Season + Year + Size*Project Area + Size*Year	1007.37	1.54
Size + Project Area + Year + Size*Year	1007.55	1.71
Size + Project Area	1007.65	1.81
Size + Project Area + Size*Project Area	1008.87	3.03
Size + Project Area + Season + Year	1008.91	3.08
Size + Project Area + Season + Year + Size*Year	1009.20	3.36
Size + Project Area + Season + Year + Size*Project Area + Size*Year + Project Area*Season	1009.27	3.43

The selected model for searcher efficiency included carcass size and project area (unvegetated versus vegetated area), with an AICc value 1.81 points higher than the lowest AICc model (Table 8); the model with covariates for size and project area was selected because it was the most parsimonious model within 2 AICc points of the lowest AICc model, and thus considered equally supported by the data. Searcher efficiency values used to adjust detections to calculate a fatality estimate are provided in Table 9 and are based on all searcher efficiency data collected to date and the selected model described above.

Table 9. Human Searcher Efficiency Sample Sizes Used for Modeling, and Model Predictions for Size and Project Area Categories Winter 1 – Fall 4.

Size	Location	Found	Available	Placed	Predicted Searcher Efficiency (90% CI)
Feather spot	Tower area (Unvegetated)	116	156	160	0.77 (0.73-0.81)
Large bird	Tower area (Unvegetated)	123	140	157	0.88 (0.85-0.91)
Small bird	Tower area (Unvegetated)	116	156	208	0.71 (0.66-0.76)

4.2 Tower Area Fatality Estimates of Known Causes for 2017 Fall Monitoring

Estimates are not provided for factor combinations with five or fewer detections; thus, marginal totals (e.g. total singed, total known cause, etc.) for the tables below may not reflect the sum of estimates within a given row or column (and are generally higher).

There were 214 bird detections where the cause of death or injury could be determined and were facility related, of which 183 were included in the fatality estimate model (Tables 10a and 10b); of these 183 detections, four were from the ACC that were added unadjusted to the estimator output, to produce the total fatality estimate of known cause (Tables 11 and 12). There were 31 detections that were not included in the fatality estimates; five were excluded because they were outside the standardized survey areas and 26 were excluded because they were determined to be older than the search interval. A subset of the incidental detections in the power block were included within the tower area total estimate, due to the assumption of a daily search interval; those incidental detections in the power block which were determined to be older than 24 hours were not included in the fatality estimator. Estimates from the tower area should be interpreted with caution due to the inclusion of numerous incidental discoveries in the power block.

During the period 18 August 2017 - 20 October 2017 (64 days of monitoring), there were an estimated 695 fatalities (90% confidence interval 560-923) based on detections from known causes (i.e., singeing, collision, or entrapment in the ACC; Table 11). Small birds accounted for 99% of the estimated fatalities of known causes (Table 12).

Table 10a. Number of Bird Detections Based on Known Causes Included or Excluded from Fatality Estimates, by Cause.

	Included			Excluded			
Location	Collision	Singed	Other*	Collision	Singed	Other	Total
Tower Area	9	170	4	0	31	0	214
Outside of Tower Area	0	0	0	0	0	0	0
Total	9	170	4	0	31	0	214

*Entrapped in ACC

Table 10b. Number of Bird Detections Based on Known Causes Included or Excluded from Fatality Estimates, by Carcass Size.

	Included			Excluded			
Location	Large Birds	Small Birds	Raptors*	Large Birds	Small Birds	Raptors*	Total
Tower Area	4	179	1	2	29	1	214
Outside of Tower Area	0	0	0	0	0	0	0
Total	4	179	1	2	29	1	214

* All raptors are considered "Large Birds", therefore the number of raptor detections in a row or column is not added to the total.

Table 11. 2017 Fall Season Avian Fatality Estimates by Cause (with Lower and Upper 90% Confidence Intervals) Based on Detections of Known Causes Included in the Model.

Location	Collision	Singed	Other*	Total Known Cause
Tower Area	37 (29-49)	655 (527-871)	N ≤ 5	695 (560-923)

*Entrapped in ACC

Table 12. 2017 Fall Season Avian Fatality Estimates by Carcass Size (with Lower and Upper 90% Confidence Intervals) Based on Detections of Known Causes Included in the Model.

Location	Large Birds	Small Birds	Raptors*	Total
Tower Area	N ≤ 5	690 (555-919)	N ≤ 5	695 (560-923)

* N ≤ 5 indicates 5 or fewer detections and no fatality estimate is provided

4.3 Tower Area Fatality Estimates from Unknown Causes

Per Section 3.1 of the Plan, fatality estimates are also to be provided based on detections of birds that were injured or that died of unknown causes. Because no observable evidence of known causes (i.e., singeing, collision, entrapment, or predation) was noted in the case of these unknown detections, they cannot be clearly included in an estimate attributed to a specific cause. The methods for determining fatality estimates for these unknown detections are the same as those described in Section 4.1 for detections with direct evidence of the cause of the fatality (i.e., singeing, collision, or other).

There were 50 detections where the cause of death could not be determined, of which 41 were included in the fatality estimator (Tables 13a and 13b). Of the nine detections of unknown cause excluded from the fatality estimator all were determined to be older than the search interval.

During the period of 18 August 2017 - 20 October 2017, the total estimate of fatalities from unknown cause was 180 (90% confidence interval 144-241; Table 14), and all unknown cause fatalities were estimated for the tower area.

Table 13a Number of Detections from Unknown Causes, and Number Included in Fatality Estimates, by Cause.

Location	Included	Excluded	Total
Tower Area	41	8	49
Outside of Tower Area	0	1	1
Total	41	9	50

Table 13b. Number of Detections from Unknown Causes, and Number Included in Fatality Estimates, by Carcass Size.

	Included			Excluded			
Location	Large Birds	Small Birds	Raptors*	Large Birds	Small Birds	Raptors*	Total
Tower Area	6	35	1	0	8	0	49
Outside of Tower Area	0	0	0	1	0	1	1
Total	6	35	1	1	8	1	50

* All raptors are considered "Large Birds", therefore the number of raptor detections in a row or column is not added to the total.

Table 14. Site-Wide Fatality Estimates from Unknown Causes by Location, 18 August 2017 - 20 October 2017.

Project Area	Estimate (90% CI)
Tower Area	180 (144-241)

Table 15. Site-Wide Fatality Estimates from Unknown Causes by Size and Location, 18 August 2017 - 20 October 2017.

Location	Large Birds	Small Birds	Raptors	Total
Tower Area	8 (7-8)	173 (137-233)	N ≤ 5	180 (144-241)

* N ≤ 5 indicates 5 or fewer detections and no fatality estimate is provided

4.4 Regional Awareness Monitoring

During the 2017 fall season, four injured birds were taken to rehab. In accordance with the Plan, staff members at the rehab center to which injured birds were transported were asked if they had received any birds with singed feathers or evidence of concentrated-flux effects; no records of singed birds were reported by the rehab center. Furthermore, neither the Ivanpah facility nor its designated biologist was contacted by any veterinarian or rehab center about singed birds brought in by non-project staff.

Section 5.0 Discussion

The 2017 fall season represented the continuation of standardized monitoring of avian and bat detections of the Ivanpah site as revised per the Avian & Bat Monitoring and Management Plan (2015).

5.1 Temporal Patterns in Detections

The number of detections reported per day was varied throughout the 2017 fall season with a higher number of detections per day recorded later in the fall monitoring season. Of note, there were twice as many detections on Oct. 18, the last day of surveys, as on all the other survey dates. BirdCast migration analyses indicated that slightly more intense flights occurred from Oct. 13 – 20 for both the Central Valley and southern Rockies (CLO 2017). The Project is located in between these two regions, suggesting an increase in migrant activity during this time period, which could account for the relatively high number of detections on Oct. 18. Thus, there is potential for fall migration to have extended beyond the fall monitoring season and biologically-informed seasonal analysis conducted for the annual report will capture extended migration. A tower area search during the 2017 fall season is a look back over approximately 7 days, so it would be expected that the tower searches would reflect the accumulation of carcasses over that time span. Otherwise, little inference can be drawn about potential temporal correlates of risk during the monitoring period based on BirdCast data.

Section 6.0 Framework for Management and Risk Response

According to Section 5.3 of the Plan, migratory bird mortality at Ivanpah is categorized as high, medium, or low to provide an appropriate biological basis for TAC review and decision making, based on the following definitions:

1. "High: Estimated avian mortality or injury levels are facility-caused and likely to seriously and negatively affect local, regional, or national avian populations within a particular species or group of species."
2. "Medium: Estimated avian mortality or injury levels are facility-caused and have the potential to negatively affect local, regional, or national populations within a particular avian species or group of species."
3. "Low: Estimated avian mortality or injury levels that have minimal or no potential to negatively affect local, regional, or national populations within a particular species or group of species."

Only limited conclusions can be drawn from the 2017 fall season fatality data owing to the low numbers of detections within "a particular species or group of species" in general; however, the results indicate that the potential migratory bird mortality by species or groups of species from this project would be categorized as low. Approximately 66% of the species or species groups were songbirds, and in general songbirds are short-lived, have high reproductive output, and their population growth rates are less sensitive to changes in survival rates than to changes in reproductive rates (Stahl and Oli 2006). Therefore, mortality of most songbird species is expected to have negligible effects on population dynamics. A more complete analysis will be conducted for the annual report.

None of the 12 identifiable species represented by more than three detections (all songbirds) is listed or particularly rare locally, regionally, or nationally. Rather, all 12 species are relatively abundant and widespread. Thus, the magnitude of detections of these species at Ivanpah during the 2017 fall season does not rise above the "low" category. Special-status species recorded as detections were 22 single yellow warblers (California species of special concern) and 1 bank swallow (California state threatened).

Yellow warblers are one of the most abundant warblers in North America and occur as both migrants and summer residents in California (Shuford and Gardali 2008). Yellow warblers occur in the Mojave Desert as common migrants, but they typically do not breed there. An estimated 600,000 yellow warblers occur within California and an estimated 34,000,000 occur in the United States (Partners in Flight Science Committee 2013). The yellow warblers detected represented a very small proportion of these populations; thus, the number of detections in 2017 fall season does not rise above the "low" category, as loss of this magnitude would have a minimal effect on populations at all geographic scales (local, regional, national or global).

The bank swallow is listed as California state threatened due to a declining population throughout the state, and most bank swallows nest along the Sacramento River and its tributaries (BSTAC 2013). An estimated 20,000 bank swallows occur regionally within California and an estimated 1,400,000 occur

nationally in the United States (Partners in Flight Science Committee 2013). As the Project area does not contain bank swallow nesting habitat, there is no local population for evaluation. The detection likely results from migrating individuals that could breed as far north as Alaska. The fatality of one bank swallow represents a very small proportion of the regional California (20,000 individuals) or national population (1,400,000 individuals); thus, the estimated bank swallow fatalities during the 2015 – 2016 monitoring year does not rise above the "low" category, as loss of this magnitude would have a minimal effect on populations at all geographic scales (regional or national).

Section 7.0 Literature Cited

Akaike, H., 1973. Information theory and an extension of the maximum likelihood principle. Pages 267–281 in 2nd International Symposium on Information Theory (B. N. Petran and F. Csaki, Eds.). Akademiai Kiado, Budapest, Hungary.

Arnold TW, Zink RM (2011) Collision Mortality Has No Discernible Effect on Population Trends of North American Birds. PLoS ONE 6(9): e24708. doi:10.1371/journal.pone.0024708.

Avian & Bat Monitoring and Management Plan - Ivanpah Solar Electric Generating System. November 2013. Available at http://docketpublic.energy.ca.gov/PublicDocuments/07-AFC-05C/TN201315201311227T160942IvanpahAvianMonitoringPlanrev12.PDF

Avian & Bat Monitoring and Management Plan - Ivanpah Solar Electric Generating System. November 2015. Available at http://docketpublic.energy.ca.gov/PublicDocuments/07-AFC-05C/TN207105_20151223T092433_Avian__Bat_Monitoring_and_Management_Plan_Nov_2015.pdf

Bureau of Land Management (BLM) 2013. Final environmental impact statement / final environmental impact report. BLM/CA/PL-2015-001+1793.

Buckland, S. T., D. R. Anderson, K. P. Burnham and J. L. Laake. 1993. Distance sampling; estimating abundance of biological populations. Chapman and Hall, NY. 446 pp.

Cornell Lab of Ornithology (CLO). BirdCast. http://birdcast.info/research/. Accessed 122017.

Humple, D. 2008. Loggerhead Shrike (*Lanius ludovicianus*) (mainland populations). Pages 271-277 *in* Shuford, W. D. and T. Gardali (eds.), California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Wildlife, Sacramento.

Huso, M. 2010. An estimator of wildlife fatality from observed carcasses. Environmetrics 22(3):318–329. Doi: 10.1002/env.1052

Huso, Manuela, Som, Nicholas, and Ladd, Lew, 2012, Fatality estimator user's guide (ver. 1.1, December 2015): U.S. Geological Survey Data Series 729, 22 p., http://dx.doi.org/10.3133/ds729.

Huso, M., Dalthorp, D.H., Miller, T., Bruns, D., 2016, Wind Energy Development- Methods for Assessing Post-Construction Bird and Bat Mortality: Human-Wildlife Interactions, v. 10, no. 1, p. 62-70.

Kagan, R. A., T. C. Viner, P. W. Trail, and E. O. Espinoza. 2015. Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis. National Fish and Wildlife Forensics Laboratory.

Korner-Nievergelt, F., P. Korner-Nievergelt, O. Behr, I. Niermann, R. Brinkmann, and B. Hellriegel. 2011. A New Method to Determine Bird and Bat Fatality at Wind Energy Turbines from Carcass Searches. Wildlife Biology 17: 350-363.

Manly, B. F. J. 1997. Randomization, Bootstrap, and Monte Carlo Methods in Biology. 2nd Edition. Chapman and Hall, London.

Partners in Flight Science Committee 2013. Population Estimates Database, version 2013. Available at http://rmbo.org/pifpopestimates. Accessed on 04 December 2015.

Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2015. The North American Breeding Bird Survey, Results and Analysis 1966 - 2012. Version 02.19.2015 USGS Patuxent Wildlife Research Center, Laurel, MD

Shuford, W. D. and Gardali, T., editors. 2008. California Bird Species of Special Concert: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Smallwood, K.S. 2007. Estimating wind turbine-caused bird mortality. Journal of Wildlife Management, 71, 2781-2791.

Stahl, J. T., and M. K. Oli. 2006 Relative importance of avian life-history variables to population growth rate. Ecological Modelling 198:183-194.

U.S. Fish and Wildlife Service (USFWS). 2012. *Final Land-Based Wind Energy Guidelines*. March 23. 82 pp. Available online at: http://www.fws.gov/windenergy/docs/WEGfinal.pdf.

Appendix A. Individual Avian Detections.

USFWS #	Common Name	Species Code	How Found	Detection Date	Collection Date	Condition	Time Since Death/Injury	Description of Carcass/Injury	Cause of Death/Injury	Burn Grade	Unit	Nearest Project Feature	UTM Coordinates	SPUT Revisions
2017_158_ISEGS	Unknown Warbler	UNWA	Incidental	8/18/2017	8/18/2017	Dead, Fresh	8-24 hours	Whole carcass. Evidence of singe to all parts of body except for lower flanks, all flight feathers singed off.	Scorched or singed	2	2	Powerblock	638660, 3935845	NA
2017_159_ISEGS	Brown-headed Cowbird	BHCO	Incidental	8/18/2017	8/18/2017	Mummified	2 weeks	Whole carcass. Evidence of curling to primary flight feathers and singed upper left breast.	Scorched or singed	1	2	Powerblock	638625, 3935828	NA

2017_160_ISEGS	Chipping Sparrow	CHSP	Incidental	8/20/2017	8/20/2017	Dead, fresh	8-24 hours	Whole carcass. Evidence of curling to all flight feathers in both wings and tail, singe to coverts, crown, nape, entire back, and rump.	Scorched or singed	2	2	Powerblock	638606, 3935847	NA
2017_161_ISEGS	Cliff Swallow	CLSW	Incidental	8/20/2017	8/20/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to flight feathers in both wings, singe to top of head, left side of nape and flank, throat, and end of rects.	Scorched or singed	2	2	Powerblock	638614, 3935900	NA

2017_162_ISEGS	Unknown Teal	TEAL	Carcass Survey	8/21/2017	8/21/2017	Feather spot	3-6 days	Feather spot size large consisting of 70 body feathers, 5 primaries, 7 secondaries, 4 trailing secondaries, 7 retrices. No evidence of collision or singe.	Unknown		3	Heliostat	637422, 3937739	NA
2017_163_ISEGS	Unknown Warbler	UNWA	Carcass Survey	8/21/2017	8/21/2017	Broken up	2 days	Broken up carcass consisting of partial left wing and 10 body feathers. Evidence of singe to several flight and body feathers.	Scorched or singed	Unk	3	Heliostat	637439, 3937758	NA

2017_164_ISEGS	White-throated Swift	WTSW	Carcass Survey	8/21/2017	8/21/2017	Feather spot	3-6 days	Feather spot size large consisting of 4 primaries, 2 secondaries, 3 retrices. Evidence of singe on all feathers.	Scorched or singed	Unk	3	Heliostat	637581, 3938073	NA
2017_165_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/22/2017	8/22/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to primaries, singe to rects.	Scorched or singed	1	3	ACC Building	637490, 3937954	NA
2017_166_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/22/2017	8/22/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to primaries and retrices, singe to top of head and back and tail.	Scorched or singed	2	3	ACC Building	637477, 3937972	NA

2017_167_ISEGS	Brown-headed Cowbird	BHCO	Carcass Survey	8/22/2017	8/22/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to upper breast/lower throat area and to both axillaries.	Scorched or singed	3	3	ACC Building	637474, 3937972	NA
2017_168_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/22/2017	8/22/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to flight feathers in both wings and end of rects, singe to coverts, top of head, right axillary.	Scorched or singed	2	3	Powerblock	637423, 3937897	NA

2017_169_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/22/2017	8/22/2017	Broken up	2 days	Broken up carcass consisting of partial left wing, 2 secondaries, 1 body feather. Evidence of curling to secondaries.	Scorched or singed	Unk	2	Powerblock	638626, 3935906	NA
2017_170_ISEGS	Black-tailed Gnatcatcher	BTGN	Carcass Survey	8/22/2017	8/22/2017	Mummified	2 weeks	Whole carcass. Evidence of curling to primaries and rectrices, singeing to shoulders.	Scorched or singed	2	3	Powerblock	637460, 3937931	NA

2017_171_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/22/2017	8/22/2017	Feather spot	3-6 days	Feather spot size small consisting of 12 body feathers, 1 covert. Evidence of singe on the body feathers.	Scorched or singed	Unk	3	Powerblock	637451, 3937933	NA
2017_172_ISEGS	Unknown Swallow	UNSW	Carcass Survey	8/22/2017	8/22/2017	Broken up	3-6 days	Broken up carcass consisting of 2 primaries, 2 alula feathers, and 1 covert attached together by dried skin. Evidence of singe to 1 primary.	Scorched or singed	1	3	Powerblock	637452, 3937932	NA
2017_173_ISEGS	Northern Rough-winged Swallow	NRWS	Carcass Survey	8/22/2017	8/22/2017	Broken up	3-6 days	Broken up carcass consisting of right wing. Evidence of singe to secondaries.	Scorched or singed	Unk	3	Powerblock	637383, 3937964	NA

2017_174_ISEGS	Rock Pigeon	ROPI	Carcass Survey	8/22/2017	8/22/2017	Alive, injured	0-8 hours	Alive bird. Evidence of singeing to tail and wings, right eye and right side of face.	Scorched or singed	2	2	Powerblock	638567, 3935832	NA
2017_175_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/23/2017	8/23/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to primaries and 3 retrices, singe to crown and flanks.	Scorched or singed	2	1	ACC Building	640378, 3933561	NA
2017_176_ISEGS	Nashville Warbler	NAWA	Carcass Survey	8/23/2017	8/23/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to primaries and rectrices, singeing to crown.	Scorched or singed	1	1	ACC Building	640376, 3933547	NA

2017_177_ISEGS	Tree Swallow	TRES	Carcass Survey	8/23/2017	8/23/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to primaries and secondaries, singe to underparts, back, and flanks with rects singed off.	Scorched or singed	2	1	ACC Building	640380, 3933543	NA
2017_178_ISEGS	Brown-headed Cowbird	BHCO	Carcass Survey	8/23/2017	8/23/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries and secondaries, singe to head, body, and flanks with rects singed off.	Scorched or singed	2	1	ACC Building	640397, 3933538	NA

2017_179_ISEGS	Northern Rough-winged Swallow	NRWS	Carcass Survey	8/23/2017	8/23/2017	Broken up	2 weeks	Broken up carcass consisting of partial right wing, 50 body feathers, 7 retrices, 7 secondaries, 9 primaries. Evidence of curling to primaries and secondaries, singe to body feathers.	Scorched or singed	Unk	2	Heliostat	638515, 3936006	NA

2017_180_ISEGS	Lazuli Bunting	LAZB	Incidental	8/26/2017	8/26/2017	Alive, injured	0-8 hours	Alive, injured bird. Evidence of curling to secondaries on both wings and to retrices, singe to left side of face.	Scorched or singed	2	3	Powerblock	637460, 3937964	NA
2017_181_ISEGS	Northern Rough-winged Swallow	NRWS	Incidental	8/26/2017	8/26/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all major flight feathers in both wings and tail and to primary coverts in both wings.	Scorched or singed	2	3	Powerblock	637423, 3937938	NA

2017_182_ISEGS	Yellow Warbler	YWAR	Incidental	8/26/2017	8/26/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all flight feathers and primary coverts in both wings and tail, singe to left side of nape and face.	Scorched or singed	2	3	Powerblock	637438, 3937963	NA
2017_183_ISEGS	Unknown Warbler	UNWA	Incidental	8/28/2017	8/28/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to all parts of body except throat with all major flight feathers singed off.	Scorched or singed	2	2	Powerblock	638643, 3935863	NA

2017_184_ISEGS	Brown-headed Cowbird	BHCO	Carcass Survey	8/28/2017	8/28/2017	Feather spot	3-6 days	Feather spot size large consisting of 3 primaries, 6 secondaries, 8 retrices, and 44 contour feathers. No evidence of collision or singe.	Unknown	3	Heliostat	637423, 3938098	NA
2017_185_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/29/2017	8/29/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to primaries, singe to rects and head.	Scorched or singed	2	3	ACC Building	637498, 3937945	NA

2017_186_ISEGS	Brewer's Sparrow	BRSP	Carcass Survey	8/29/2017	8/29/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all flight feathers, singe to head, back, rump, breast, and flanks.	Scorched or singed	2	3	ACC Building	637490, 3937959	NA
2017_187_ISEGS	Brewer's Sparrow	BRSP	Carcass Survey	8/29/2017	8/29/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all flight feathers, singe to flanks, breast, and rump.	Scorched or singed	2	3	ACC Building	637468, 3937959	NA
2017_188_ISEGS	Unknown Swallow	UNSW	Carcass Survey	8/29/2017	8/29/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to all flight and tail feathers, neck, head, and back singed.	Scorched or singed	2	3	ACC Building	637475, 3937972	NA

2017_189_ISEGS	Hermit Warbler	HEWA	Carcass Survey	8/29/2017	8/29/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to all flight feathers in both wings and tail, lower mandible broken.	Scorched or singed	2	3	ACC Building	637496, 3937985	NA
2017_190_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/29/2017	8/29/2017	Broken up	2 weeks	Broken up carcass consisting of middle part of left wing with secondaries and coverts. Evidence of singe on coverts and leading edge of secondaries.	Scorched or singed	1	3	Powerblock	637384, 3937961	NA

2017_191_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/29/2017	8/29/2017	Broken up	3-6 days	Broken up carcass consisting of 13 primaries, 15 secondaries, 6 rects, 75 contour feathers and skull. No evidence of collision or singe.	Scorched or singed	Unk	2	Heliostat	638476, 3936000	NA

2017_192_ISEGS	Bank Swallow	BANS	Carcass Survey	8/29/2017	8/29/2017	Broken up	3-6 days	Broken up carcass consisting of partial torso including right wing, several primaries of left wing still attached to cavity and right leg present. Evidence of possible collision with apparent injury to cavity and location where found.	Collision (other)		3	ACC Building	637509, 3937954	NA

2017_193_ISEGS	American Kestrel	AMKE	Carcass Survey	8/29/2017	8/29/2017	Broken up	2 weeks	Broken up carcass consisting of outer portions of both wings, 2 bones, 10 contour feathers. Evidence of curling to primaries and primary coverts, remaining coverts singed.	Scorched or singed	1	3	Powerblock	637371, 3937960	NA
2017_194_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/29/2017	8/29/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of singe on top of head.	Scorched or singed	3	3	Powerblock	637444, 3937855	NA
2017_195_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/29/2017	8/29/2017	Feather spot	2 weeks	Feather spot size small consisting of 20 coverts. No evidence of collision or singe.	Unknown		3	Powerblock	637453, 3937913	NA

2017_196_ISEGS	Wilson's Warbler	WIWA	Carcass Survey	8/29/2017	8/29/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of singe to right side of nape, upper breast, right axillary and flank with all flight feathers singed off.	Scorched or singed	2	3	Powerblock	637493, 3937940	NA
2017_197_ISEGS	Unknown Warbler	UNWA	Carcass Survey	8/29/2017	8/29/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to head, face, and lower back.	Scorched or singed	Unk	3	Powerblock	637505, 3037937	NA
2017_198_ISEGS	Nashville Warbler	NAWA	Carcass Survey	8/30/2017	8/30/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe on front of forehead.	Scorched or singed	3	2	ACC Building	638674, 3935897	NA

2017_199_ISEGS	Unknown Warbler	UNWA	Carcass Survey	8/30/2017	8/30/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to entire body with all major flight feathers singed off.	Scorched or singed	2	2	ACC Building	638652, 3935897	NA
2017_200_ISEGS	Unknown Sparrow	UNSP	Carcass Survey	8/30/2017	8/30/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to all major flight feathers and singe to entire body except for breast and belly.	Scorched or singed	2	2	ACC Building	638641, 3935895	NA

2017_201_ISEGS	Unknown Swallow	UNSW	Incidental	8/30/2017	8/30/2017	Mummified	1 month +	Whole carcass. Evidence of curling to primaries, secondaries, and rects, singe to contour feathers on back and head.	Scorched or singed	2	2	Powerblock	638664, 3935863	NA
2017_202_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/30/2017	8/30/2017	Feather spot	3-6 days	Feather spot size large consisting of 8 rectrices, 6 primaries, 9 secondaries, 8 unidentified flight feathers, 2 contour feathers. Evidence of curling to flight feathers.	Scorched or singed	1	2	Powerblock	638566, 3935895	NA

2017_203_ISEGS	Unknown Hummingbird	UNHU	Carcass Survey	8/30/2017	9/12/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to 2 primaries with flight feathers in tail singed off, singe to all parts of body.	Scorched or singed	2	2	ACC Building	638657, 3935908	NA
2017_204_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/30/2017	8/30/2017	Feather spot	3-6 days	Feather spot size of 13 body feathers, 2 coverts, 2 unidentified flight feathers. Evidence of singe on flight feathers and coverts.	Scorched or singed	Unk	2	Powerblock	638695, 3935878	NA
2017_205_ISEGS	Townsend's Warbler	TOWA	Carcass Survey	8/30/2017	8/30/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. No evidence of collision or singe.	Unknown		2	Powerblock	638653, 3935845	NA

2017_206_ISEGS	Mourning Dove	MODO	Incidental	8/30/2017	8/30/2017	Alive, injured	0-8 hours	Alive bird. Appeared dehydrated.	N/A		3	Powerblock	637501, 3937899	NA
2017_207_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/31/2017	8/31/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to all flight feathers in wing and tail, singe to top of head, nape, back, rump, and left axillary.	Scorched or singed	2	1	ACC Building	640412, 3933521	NA
2017_208_ISEGS	Northern Rough-winged Swallow	NRWS	Carcass Survey	8/31/2017	8/31/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. No evidence of collision or singe.	Unknown		1	ACC Building	640386, 3933522	NA

2017_209_ISEGS	Rufous Hummingbird	RUHU	Carcass Survey	8/31/2017	8/31/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to retrices, singe to tips of primaries, top of head, nape, back, rump, left flanks and side of face.	Scorched or singed	1	1	ACC Building	640362, 3933521	NA
2017_210_ISEGS	Western Tanager	WETA	Carcass Survey	8/31/2017	8/31/2017	Feather spot	3-6 days	Feather spot size large consisting of 13 primaries, 10 secondaries, 8 retrices, and 100 contour feathers. Evidence of singe to tips of primaries, secondaries, and to rect feathers.	Scorched or singed	1	1	Heliostat	640199, 3933335	NA

2017_211_ISEGS	Brown-headed Cowbird	BHCO	Carcass Survey	8/31/2017	8/31/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to flight feathers in wings and tail, singe to head, nape, rump, and throat.	Scorched or singed	2	1	ACC Building	640399, 3933534	NA
2017_212_ISEGS	Unknown Swallow	UNSW	Carcass Survey	8/31/2017	8/31/2017	Broken up	2 weeks	Broken up carcass consisting of outermost portion of right wing, 1 left primary, 5 contour feathers. Evidence of singe on primaries.	Scorched or singed	1	1	Powerblock	640363, 3933493	NA

2017_213_ISEGS	Northern Mockingbird	NOMO	Carcass Survey	8/31/2017	8/31/2017	Broken up	3-6 days	Broken up carcass consisting of 6 primaries with several held together by dried flesh, 1 retrix, and 5 coverts. Evidence of singe on 4 primaries.	Scorched or singed	Unk	1	Powerblock	640354, 3933502	NA
2017_214_ISEGS	Brown-headed Cowbird	BHCO	Carcass Survey	8/31/2017	8/31/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of collision by tip of broken bill and close proximity to heliostat mirror.	Collision with solar panel/heliostat		1	Heliostat	640597, 3933522	NA

2017_215_ISEGS	Unknown Small Bird	UNID	Carcass Survey	8/31/2017	8/31/2017	Feather spot	2 weeks	Feather spot size large consisting of 5 primaries, 2 secondaries, and 5 coverts. No evidence of collision or singe.	Unknown	1	Heliostat	640330, 3933364	NA	
2017_216_ISEGS	Black-Throated Sparrow	BTSP	Incidental	9/1/2017	9/1/2017	Mummified	2 weeks	Whole carcass. Evidence of singe to all parts of body with flight feathers in both wings and tail singed off.	Scorched or singed	2	3	Powerblock	637487, 3937914	NA

2017_217_ISEGS	Tree Swallow	TRES	Incidental	9/1/2017	9/1/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to back, both axillaries, nape, rump, with flight feathers in tail and majority in wings singed off.	Scorched or singed	2	3	Powerblock	637487, 3937914	NA
2017_218_ISEGS	Black-Throated Sparrow	BTSP	Incidental	9/1/2017	9/1/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe on back, head, nape, tail, and throat, with all flight feathers in tail and majority in wings singed off.	Scorched or singed	2	3	Powerblock	637487, 3937914	NA

2017_219_ISEGS	Brown-headed Cowbird	BHCO	Incidental	9/1/2017	9/1/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to flight feathers in both wings and tail, singe to forehead, axillaries, and breast.	Scorched or singed	2	3	Powerblock	637487, 3937914	NA
2017_220_ISEGS	Bullock's Oriole	BUOR	Incidental	9/1/2017	9/1/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. No evidence of singe or collision.	Unknown		3	Powerblock	637487, 3937914	NA
2017_221_ISEGS	Brewer's Sparrow	BRSP	Carcass Survey	9/5/2017	9/5/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all flight feathers in tail and both wings, singe to head, rump, and flanks.	Scorched or singed	2	3	ACC Building	637459, 3937947	NA

2017_222_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/5/2017	9/5/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to all flight feathers in wing, head, back, flanks, with all feathers in tail singed off.	Scorched or singed	2	3	Heliostat	637459, 3037947	NA
2017_223_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/5/2017	9/5/2017	Feather spot	3-6 days	Feather spot size large consisting of 6 primaries, 4 secondaries, 1 retrix, and 2 coverts. Evidence of singe to all feathers.	Scorched or singed	Unk	3	Heliostat	637488, 3938079	NA

2017_224_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/5/2017	9/5/2017	Feather spot	3-6 days	Feather spot size large consisting of 4 retrices, 1 contour feather, 4 primaries, and 2 secondaries. Evidence of singe on secondaries and rectrices.	Scorched or singed	Unk	3	Heliostat	637366, 3938073	NA
2017_225_ISEGS	Northern Rough-winged Swallow	NRWS	Carcass Survey	9/5/2017	9/5/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to tip of rectrices.	Scorched or singed	1	3	Heliostat	637464, 3937935	NA
2017_226_ISEGS	Yellow-headed Blackbird	YHBL	Carcass Survey	9/5/2017	9/5/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of collision with tip of bill broken and evidence of blood from nostril.	Collision with solar panel/heliostat		3	Heliostat	637684, 3938004	NA

2017_227_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/6/2017	9/6/2017	NA	NA	NA	Unknown		2	ACC Building	638650, 3935910	NA
2017_228_ISEGS	Wilson's Warbler	WIWA	Carcass Survey	9/6/2017	9/6/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to right wing and tail with left wing singed off, singe to crown, flanks and breast.	Scorched or singed	2	2	ACC Building	638666, 3935883	NA
2017_229_ISEGS	Unknown Warbler	UNWA	Carcass Survey	9/6/2017	9/6/2017	Feather spot	2 weeks	Feather spot size small, consisting of 5 primaries and 1 secondary. No evidence of collision or singe.	Unknown		2	Powerblock	638640, 3935875	NA

2017_230_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/6/2017	9/6/2017	Broken up	2 days	Broken up carcass consisting of 7 primaries held together by dried flesh, 2 secondaries, and 30 contour feathers. Evidence of singe on secondaries.	Scorched or singed	Unk	2	Powerblock	638635, 3935828	NA
2017_231_ISEGS	Unknown Grebe	UNGR	Carcass Survey	9/6/2017	9/6/2017	Broken up	2 weeks	Broken up carcass consisting of tip of left wing, 1 primary, 1 retrix, 2 clumps of contour feathers with skin. Evidence of singe on tips of primaries and retrix.	Scorched or singed	1	2	Heliostat	638590, 3936085	NA

2017_232_ISEGS	Tree Swallow	TRES	Carcass Survey	9/7/2017	9/7/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to primaries and retrices, singe to back, rump, and cap.	Scorched or singed	2	1	ACC Building	640392, 3933522	NA
2017_233_ISEGS	Verdin	VERD	Carcass Survey	9/7/2017	9/7/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to left wing and retrices, singe to rump, with feathers in right wing singed off.	Scorched or singed	2	1	ACC Building	640367, 3933534	NA

2017_234_ISEGS	Black-tailed Gnatcatcher	BTGN	Carcass Survey	9/7/2017	9/7/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to left wing and retrices with flight feathers in right wing singed off, singe to crown, back, rump, and flanks.	Scorched or singed	2	1	ACC Building	640384, 3933546	NA

2017_235_ISEGS	Unknown Swallow	UNSW	Carcass Survey	9/7/2017	9/7/2017	Feather spot	3-6 days	Feather spot size large consisting of 6 primaries, 5 retrices, 4 flight feathers, 11 contour and covert feathers. Evidence of curling to all flight feathers with singe to coverts.	Scorched or singed	2	1	Powerblock	640365, 3033509	NA
2017_236_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/7/2017	9/7/2017	Feather spot	2 days	Feather spot size large consisting of 5 primaries, 2 secondaries, 4 retrices, and 30 contour feathers. No evidence of collision or singe.	Unknown		1	Powerblock	640408, 3933483	NA

2017_237_ISEGS	Bullock's Oriole	BUOR	Carcass Survey	9/7/2017	9/7/2017	Feather spot	3-6 days	Feather spot size large consisting of 8 retrices, 6 secondaries, 2 primaries, 70 body feathers and 15 pieces of broken flight feathers. Evidence of singe to retrices and secondaries.	Scorched or singed	Unk	1	Powerblock	640401, 3933482	NA
2017_238_ISEGS	Violet-green Swallow	VGSW	Carcass Survey	9/11/2017	9/11/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe on primaries, head, nape, and back.	Scorched or singed	1	3	ACC Building	637466, 3937952	NA

2017_239_ISEGS	Nashville Warbler	NAWA	Carcass Survey	9/11/2017	9/27/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Bird was unable to be retrieved during search due to placement below grate in Alley C. All applicable data fields will be filled when carcass is delivered to lab for processing. Bird retrieved from ACC on 9/27/2017 Evidence of singe on head	Scorched or singed	1	3	ACC Building	637469, 3937972	NA

2017_240_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/11/2017	9/11/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries and secondaries and rectrices, singe to crown, back, rump, and left flank.	Scorched or singed	2	3	Powerblock	637434, 3937943	NA
2017_241_ISEGS	Yellow Warbler	YWAR	Incidental	9/9/2017	9/11/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	8-24 hours	Whole carcass, No evidence of collision or singe.	Unknown		3	ACC Building	637487, 3937978	NA

2017_242_ISEGS	Brewer's Sparrow	BRSP	Carcass Survey	9/11/2017	9/11/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries with secondaries and retrice feathers singed off, singe to head, throat, and breast.	Scorched or singed	2	3	Powerblock	637470, 3937889	NA
2017_243_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/11/2017	9/11/2017	Feather spot	2 weeks	Feather spot size small consisting of 20 contour feathers. Evidence of singe on 11 contour feathers.	Scorched or singed	Unk	3	Powerblock	637412, 3937913	NA
2017_244_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/11/2017	9/11/2017	Mummified	2 weeks	Whole carcass. Evidence of singeing to both wings, back, nape, and breast.	Scorched or singed	Unk	3	Powerblock	637466, 3937924	NA

2017_245_ISEGS	Nashville Warbler	NAWA	Carcass Survey	9/12/2017	9/12/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to both wings and tail, singe to head, back, and nape.	Scorched or singed	2	2	ACC Building	638666, 3935908	NA
2017_246_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/12/2017	9/12/2017	Feather spot	3-6 days	Feather spot size small consisting of 30 body feathers, 1 covert. No evidence of collision or singe.	Unknown		2	Powerblock	638637, 3935830	NA

2017_247_ISEGS	Rock Dove	ROPI	Carcass Survey	9/12/2017	9/12/2017	Alive, injured	0-8 hours	Alive, injured bird. Evidence of curling to flight feathers in both wings and tail, singe to coverts in both wings, right eye and right side of face.	Scorched or singed	2	2	Powerblock	638632, 3935845	NA
2017_248_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/12/2017	9/12/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to primaries and secondaries, singe to flanks and nape.	Scorched or singed	1	2	Powerblock	638623, 3935936	NA
2017_249_ISEGS	Lazuli Bunting	LAZB	Carcass Survey	9/13/2017	9/13/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of singe on tips of flight feathers and top of head.	Scorched or singed	1	1	Powerblock	640297, 3933541	NA

2017_250_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/13/2017	9/13/2017	Feather spot	3-6 days	Feather spot size large consisting of 3 primaries, 1 covert, and 45 body feathers. Evidence of singe on all 3 primaries.	Scorched or singed	Unk	1	Powerblock	640346, 3933505	NA
2017_251_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/13/2017	9/13/2017	Feather spot	3-6 days	Feather spot size large consisting of 5 primaries, 2 retrices, 2 flight feathers. Evidence of singe on all flight feathers and rects.	Scorched or singed	1	1	Powerblock	640354, 3933486	NA
2017_252_ISEGS	Lazuli Bunting	LAZB	Incidental	9/13/2017	9/13/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. No evidence of collision or singe.	Unknown		2	Powerblock	638622, 3935864	NA

2017_253_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/14/2017	9/14/2017	Broken up	3-6 days	Broken up carcass consisting of part of left wing and 45 contour feathers. Evidence of curling to all flight feathers, singe to contour feathers.	Scorched or singed	2	1	Heliostat	640303, 3933389	NA
2017_254_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/18/2017	9/18/2017	Broken up	2 weeks	Broken up carcass consisting of 4 retrices and a skull. Evidence of singe to 2 retrices.	Scorched or singed	Unk	3	Heliostat	637372, 3937808	NA

2017_255_ISEGS	Green-Tailed Towhee	GTTO	Carcass Survey	9/18/2017	9/18/2017	Broken up	3-6 days	Broken up carcass consisting of partial right and left wings, pieces of tail, 1 retrix, 10 secondaries, and 150 contour feathers. Evidence of singe on several secondaries. Evidence of collision with heliostat imprint of crown feathers matching species. Ev	Collision with solar panel/heliostat	3	Heliostat	637220, 3937909	NA	
2017_256_ISEGS	Rufous Hummingbird	RUHU	Carcass Survey	9/18/2017	9/18/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to rects, singe to uppertail coverts.	Scorched or singed	1	3	Powerblock	637449, 3937931	NA

2017_257_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/18/2017	9/18/2017	Broken up	2 days	Broken up carcass consisting of cluster of 80 contour feathers attached by dried skin. No evidence of collision or singe.	Unknown	3	Powerblock	637450, 3937931	NA

2017_258_ISEGS	Unknown Grebe	UNGR	Carcass Survey	9/18/2017	9/18/2017	Broken up	3-6 days	Broken up carcass consisting of partial left wing, 2 pieces of right wing, 2 pieces of neck plumage connected by dried skin, 2 pieces of body plumage attached by dried skin, 300 contour feathers and 1 bone. No evidence of collision or singe.	Unknown		3	Heliostat	637271, 3938023	NA
2017_259_ISEGS	Verdin	VERD	Carcass Survey	9/18/2017	9/18/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to flight feathers in wing and tail, singe to rump and lower back.	Scorched or singed	Unk	3	Powerblock	637431, 3937957	NA

2017_260_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/18/2017	9/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 2 retrices, 20 contour feathers and a 5 back feathers. Evidence of singe on several contour feathers.	Scorched or singed	3	3	Powerblock	637384, 3937958	NA

2017_261_ISEGS	Lark Sparrow	LASP	Carcass Survey	9/18/2017	9/18/2017	Broken up	3-6 days	Broken up carcass consisting of partial left wing, 7 primaries, 12 secondaries, 5 trailing secondaries, 9 retrices, and 25 contour feathers. Evidence of singe on tips of primaries, secondaries, and coverts.	Scorched or singed	1	3	Heliostat	637425, 3938057	NA

2017_262_ISEGS	Unknown Small Bird	UNID	Carcass Survey	9/18/2017	9/18/2017	Broken up	1 month +	Broken up carcass consisting of whole skull without much skin and no feathers. No evidence of collision or singe.	Unknown		3	Powerblock	637384, 3937958	NA
2017_263_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/18/2017	9/18/2017	Feather spot	0-8 hours	Feather spot size small consisting of 9 contour feathers and 1 retrix. Evidence of singe to retrix.	Scorched or singed	1	3	Powerblock	637413, 3937978	NA
2017_264_ISEGS	Blue-Gray Gnatcatcher	BGGN	Carcass Survey	9/18/2017	9/18/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to rects, singe to right wing coverts, head, and rump.	Scorched or singed	1	3	Heliostat	637554, 3937764	NA

2017_265_ISEGS	Lazuli Bunting	LAZB	Incidental	9/18/2017	9/18/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to 1 retrix and coverts, singe to back and secondaries.	Scorched or singed	1	3	Heliostat	637477, 3937907	NA
2017_266_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/19/2017	9/19/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 weeks	Whole carcass. Curling to primaries, secondaries, and retrices with some feathers singed off, singe to head, breast, back, and wing coverts.	Scorched or singed	2	2	ACC Building	638690, 3935883	NA

2017_267_ISEGS	Townsend's Warbler	TOWA	Carcass Survey	9/19/2017	9/20/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 weeks	Whole carcass. Evidence of curling to retrices, singe to primaries, secondaries, head, breast, and right side of face.	Scorched or singed	1	2	ACC Building	638699, 3935895	NA
2017_268_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/19/2017	9/19/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to all major flight feathers in both wings and tail, singe to back, head, and coverts.	Scorched or singed	2	2	ACC Building	638663, 3935908	NA

2017_269_ISEGS	Unidentified Flycatcher	UNFL	Carcass Survey	9/19/2017	9/19/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to primary coverts, singe to head, back, rump, throat, and breast.	Scorched or singed	2	2	ACC Building	638696, 3935920	NA
2017_270_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/19/2017	9/19/2017	Feather spot	3-6 days	Feather spot size small consisting of 10 contour feathers. Evidence of singe on 1 contour feather.	Scorched or singed	3	2	ACC Building	638640, 3935923	NA

2017_271_ISEGS	Unknown Warbler	UNWA	Carcass Survey	9/19/2017	9/19/2017	Feather spot	3-6 days	Feather spot size large consisting of 5 primaries, 3 secondaries, 1 covert, 9 retrices, and 9 contour feathers. No evidence of collision or singe.	Unknown	2	Powerblock	638638, 3935869	NA
2017_272_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/19/2017	9/19/2017	Feather spot	3-6 days	Feather spot size small consisting of 3 primaries and 4 contour feathers. No evidence of collision or singe.	Unknown	2	Powerblock	638633, 3935841	NA
2017_273_ISEGS	Nashville Warbler	NAWA	Carcass Survey	9/19/2017	9/19/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. No evidence of collision or singe.	Unknown	2	Heliostat	638474, 3935724	NA

2017_274_ISEGS	Barn Swallow	BARS	Carcass Survey	9/19/2017	9/19/2017	Feather spot	8-24 hours	Feather spot size large consisting of 5 primaries, 7 retrices, 5 secondaries, 2 tertials, 30 body feathers. Evidence of singe on several contour feathers.	Scorched or singed	3	2	Heliostat	638598, 3935711	NA

2017_275_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/19/2017	9/19/2017	Feather spot	3-6 days	Feather spot size large consisting of 2 primaries, 2 secondaries, 1 flight feather, 1 covert, 10 contours. Evidence of curling to primaries and secondaries, singe to contours.	Scorched or singed	2	2	Powerblock	638636, 3935847	NA

2017_276_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/19/2017	9/19/2017	Broken up	2 days	Broken up carcass consisting of 50mm long section of partial torso with attached leg bone. Evidence of singe to several contour feathers.	Scorched or singed	Unk	2	Powerblock	638644, 3935859	NA

2017_277_ISEGS	Northern Rough-winged Swallow	NRWS	Carcass Survey	9/19/2017	9/19/2017	Broken up	3-6 days	Broken up carcass consisting of 5 primaries, 3 of which are connected by skin, 3 secondaries, 2 clumps of contour feathers connected by dried flesh, 45 loose contour feathers. Evidence of curling to primaries and secondaries, singe to contour feathers.	Scorched or singed	Unk	2	Powerblock	638645, 3935854	NA

2017_278_ISEGS	Unknown Swallow	UNSW	Carcass Survey	9/19/2017	9/19/2017	Broken up	3-6 days	Broken up carcass consisting of partial right wing and 5 contour feathers. Evidence of curling to wing flight feathers, singe to contours.	Scorched or singed	1	2	Powerblock	638642, 3835868	NA
2017_279_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	9/20/2017	9/20/2017	Feather spot	3-6 days	Feather spot size large consisting of 2 primaries, 2 secondaries, 4 retrices, 32 contour feathers. Evidence of singe on 1 secondary.	Scorched or singed	Unk	1	Heliostat	640192, 3933611	NA

2017_280_ISEGS	Orange-crowned Warbler	OCWA	Carcass Survey	9/20/2017	9/20/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to both wings with flight feathers in tail singed off, singe to head, upper breast, nape, right side of face, axillaries, coverts.	Scorched or singed	2	1	ACC Building	640396, 3933547	NA

2017_281_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/20/2017	9/20/2017	Broken up	3-6 days	Broken up carcass consisting of partial right wing, 2 pieces of wing structure, 27 broken feathers, 80 contour feathers. Evidence of curling to all flight feathers and singe to many contour feathers.	Scorched or singed	Unk	1	Powerblock	640360, 3933486	NA

2017_282_ISEGS	Blue-Gray Gnatcatcher	BGGN	Carcass Survey	9/20/2017	9/20/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of collision with heliostat with matching feathers stuck upon mirror directly above bird. Evidence of curling to primaries, secondaries, and retrices.	Scorched or singed	1	1	Heliostat	640592, 3933583	NA

2017_283_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/20/2017	9/20/2017	Broken up	3-6 days	Broken up carcass consisting of 2 pieces of partial left wing, 1 primary, 1 secondary, and 200 contour feathers. No evidence of collision or singe.	Unknown		1	Heliostat	640540, 3933671	NA
2017_284_ISEGS	Rufous Hummingbird	RUHU	Carcass Survey	9/20/2017	9/20/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of singe to uppertail coverts.	Scorched or singed	3	1	Powerblock	640398, 3933444	NA

2017_285_ISEGS	Hermit Warbler	HEWA	Incidental	9/20/2017	9/20/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of singe. Primaries curled. Secondaries and rects singed off. Head, back, rump, throat, and right breast singed.	Scorched or singed	2	3	Powerblock	637487, 3937914	NA
2017_286_ISEGS	Brown-headed Cowbird	BHCO	Incidental	9/21/2017	9/21/2017	Mummified	2 weeks	Whole carcass. Evidence of singe. Primaries, secondaries, and retricies curled. Carcass singed on head, nape, back, and flanks.	Scorched or singed	2	2	Powerblock	638660, 3935845	NA
2017_287_ISEGS	Chipping Sparrow	CHSP	Incidental	9/24/2017	9/24/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass with no evidence of singe or collision.	Unknown		3	Heliostat	637574, 3938102	NA

2017_288_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/25/2017	9/25/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole Carcass. Evidence of singe. Primaries and secondaries, and most rects singed off. Head, back, and rump singed.	Scorched or singed	2	3	ACC Building	637514, 3937946	NA
2017_289_ISEGS	Orange-crowned Warbler	OCWA	Carcass Survey	9/25/2017	9/25/2017	Dead, fresh (eyes moist)	0-8 hours	Whole Carcass. Evidence of singe on left side of face.	Scorched or singed	3	3	Powerblock	637380, 3937910	NA

2017_290_ISEGS	Bewick's Wren	BEWR	Carcass Survey	9/25/2017	9/25/2017	Broken up	2 days	Broken up carcass consisting of 13 primaries, 2 secondaries, a partial right wing (2 primaries w/11 coverts attached), 6 retricies and 80+ body feathers. Evidence of singe on contour feathers.	Scorched or singed	Unk	3	Heliostat	637288, 3938060	NA
2017_291_ISEGS	Unidentified Swallow	UNSW	Carcass Survey	9/25/2017	9/25/2017	Feather spot	2 weeks	Featherspot consisting of 2 primaries. Evidence of singe on both feathers.	Scorched or singed	Unk	3	Powerblock	637505, 3937897	NA

2017_292_ISEGS	Unknown Bird	UNBD	Carcass Survey	9/25/2017	9/25/2017	Broken up	3-6 days	Broken up carcass consisting of 10 body feathers attached to a dessicated piece of skin. No evidence of singe	Unknown		3	Heliostat	637307, 3938081	NA

2017_293_ISEGS	White-throated Swift	WTSW	Carcass Survey	9/25/2017	9/25/2017	Feather spot	3-6 days	Featherspot consisting of 9 primaries, 7 retricies, 2 unidentified flight feathers, 3 coverts, and 3 contour feathers. Evidence of singe. Primaries and retricies curled and contour feathers singed.	Scorched or singed	2	3	Powerblock	637419, 3937971	NA

2017_294_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/25/2017	9/25/2017	Broken up	1 month +	Broken up carcass consisting of 14 primaries, 5 unknown flight feathers, 10 coverts, 5 retricies, 60+ contour feathers, 13 misc bones, sternum, and skull. Evidence of singe on all flight feathers and many of the contour feathers.	Scorched or singed	Unk	3	Powerblock	637417, 3937972	NA
2017_295_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/25/2017	9/25/2017	Feather spot	3-6 days	Featherspot consisting of 2 primaries and 12 contour feathers.	Unknown		3	Heliostat	637440, 3938156	NA

2017_296_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	9/25/2017	9/25/2017	Feather spot	3-6 days	Featherspot consisting of 4 primaries, 9 secondaries, 4 retrix, and 100+ body feathers. Evidence of singe. Primaries, secondaries, and retricies curled. Body feathers singed.	Scorched or singed	3	3	Heliostat	637528, 3937752	NA

2017_297_ISEGS	Unidentified Warbler	UNWA	Carcass Survey	9/26/2017	9/26/2017	Broken up	2 days		Broken up carcass consisting of partial right wing (3 primaries, 4 coverts), 3 secondaries, and 2 retricies. No evidence of singe or collision.	Unknown		2	Heliostat	638597, 3936022	NA

2017_298_ISEGS	Mourning Dove	MODO	Carcass Survey	9/26/2017	9/26/2017	Broken up	3-6 days	Broken up carcass consisting of partial left wing, 11 primaries, 8 secondaries, 9 rects, and 300+ contour feathers. Evidence of collision. Imprint on heliostat matching size of bird.	Collision with solar panel/heliostat	2	Heliostat	638608, 3936053	NA

2017_299_ISEGS	Unidentified Warbler	UNWA	Carcass Survey	9/26/2017	9/26/2016	Feather spot	3-6 days	Featherspot consisting of 2 primaries, 6 contour feathers, +1 secondary. Evidence of singe on primaries with curled barbs.	Scorched or singed	Unk	2	Powerblock	638643, 3935860	NA
2017_300_ISEGS	Eared Grebe	EAGR	Carcass Survey	9/27/2017	9/27/2016	Injured	0-8 hours	Live bird with no evidence of singe or collision	N/A		1	Heliostat	640236, 3933430	NA

2017_301_ISEGS	House Finch	HOFI	Carcass Survey	9/27/2017	9/27/2016	Broken up	2 weeks	Broken up carcass consisting of 2 pieces of left winig, 1 piece of right wing, several broken primaries and coverts with skin attached and 25+ body feathers. Evidence of singe on several body feathers with 2 curled flight feathers.	Scorched or singed	Unk	1	Powerblock	640295, 3933473	NA
2017_302_ISEGS	Yellow Warbler	YWAR	Carcass Survey	9/27/2017	9/27/2016	Broken up	8-24 hours	Broken up carcass consisting of a left wing. Evidence on singe seen on secondary.	Scorched or singed	Unk	1	Powerblock	640301, 3933474	NA

2017_303_ISEGS	Unidentified Sparrow	UNSP	Carcass Survey	9/27/2017	9/27/2016	Feather spot	2 days	Feather spot consisting of 4 primaries, 1 secondary, 1 rect, and 75+body feathers. No evidence of singe or collision.	Unknown		1	Heliostat	640211, 3933394	NA
2017_304_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/27/2017	9/27/2016	Feather spot	3-6 days	Feather spot consisting of 1 primary, 1 secondary, and 10 coverts. Evidence of singe on 7 coverts with primary feather curled.	Scorched or singed	Unk	1	Heliostat	640298, 3933385	NA

2017_305_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/27/2017	9/27/2016	Feather spot	3-6 days	Feather spot consisting of 10 body feathers and 4 undertail coverts. No evidence of singe or collision.	Unknown		1	Powerblock	640351, 3933504	NA
2017_306_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/27/2017	9/27/2016	Feather spot	3-6 days	Feather spot consisting of 1 secondary and 15 contour feathers. Evidence of singe on contour feathers.	Scorched or singed	3	1	Powerblock	640351, 3933503	NA
2017_307_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/27/2017	9/27/2016	Feather spot	3-6 days	Feather spot consisting of 150+ contour feathers. No evidence of singe or collision.	Unknown		1	Powerblock	640420, 3933480	NA

2017_308_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	9/27/2017	9/27/2016	Broken up	1 month +	Broken up carcass consisting of the left wing.	Scorched or singed	2	1	Powerblock	640417, 3933496	NA
2017_309_ISEGS	Unidentified Gnatcatcher	UNGN	Carcass Survey	9/27/2017	9/27/2016	Feather spot	3-6 days	Feather spot consisting of 7 secondaries, 2 rects, and 15 contour. Evidence of singe; 3 curled secondaries with rects and contours singed.	Scorched or singed	1	1	Heliostat	640324, 3933381	NA
2017_310_ISEGS	Yellow-rumped Warbler	YRWA	Incidental	9/28/2017	9/28/2016	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of sing on breast. Curling of feathers in right wing and tail.	Scorched or singed	1	2	Powerblock	638620, 3935831	NA

2017_311_ISEGS	Townsend's Warbler	TOWA	Incidental	9/30/2017	10/2/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to flight feathers, singe to throat, back, rump, and flanks.	Scorched or singed	2	3	Powerblock	637462, 3937929	NA

2017_312_ISEGS	Black-throated Gray Warbler	BTYW	Carcass Survey	10/2/2017	10/2/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. evidence of singe. Curling to all major flight feathers in wings and tail. Singe to throat, breast, axillaries, and top of head.	Scorched or singed	2	3	ACC Building	637501, 3937960	NA

2017_313_ISEGS	Unknown Hummingbird	UNHU	Carcass Survey	10/2/2017	10/2/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe. Curling to wings and tail with all major flight feathers singed off. Singe to every part of body except the upper breast.	Scorched or singed	2	3	ACC Building	637514, 3937972	NA
2017_314_ISEGS	Yellow Warbler	YWAR	Carcass Survey	10/2/2017	10/2/2017	Feather spot	3-6 days	Feather spot consisting of 1 primary, 1 secondary, and 25 contour feathers. Evidence of singe on contour feathers.	Scorched or singed	1	3	NA	637293, 3937789	NA

2017_315_ISEGS	White-Crowned Sparrow	WCSP	Carcass Survey	10/2/2017	10/2/2017	Feather spot	3-6 days	Feather spot consisting of 6 primaries, 5 secondaries, 5 retricies, and 20 contour and covert feathers. No evidence of singe or collision.	Unknown	3	Heliostat	637294, 3937792	NA
2017_316_ISEGS	Yellow Warbler	YWAR	Carcass Survey	10/2/2017	10/2/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of singe. Curing to all major flight feathers in wing and tail. Singe to top of head, breast, flanks, and coverts.	Scorched or singed	2	3	Powerblock	637478, 3937856	NA

2017_317_ISEGS	White-Crowned Sparrow	WCSP	Carcass Survey	10/2/2017	10/2/2017	Feather spot	2 weeks	Feather spot consisting of 2 secondaries, 20 covert and contour feathers. No evidence of singe or collision	Unknown		3	Heliostat	637423, 3937788	NA
2017_318_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/2/2017	10/2/2017	Broken up	1 month +	Broken up carcass consisting of the right wing. Evidence of singe. All flight feathers curled.	Scorched or singed	Unk	3	Heliostat	637431, 3937800	NA
2017_319_ISEGS	Unknown Sparrow	UNSP	Carcass Survey	10/2/2017	10/2/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to 1 retrix and to several secondaries.	Scorched or singed	1	3	Powerblock	637452, 3937902	NA

2017_320_ISEGS	House Wren	HOWR	Carcass Survey	10/2/2017	10/2/2017	Dead, fresh (eyes moist)	8-24 hours	Feather spot size large consisting of 11 primaries, 11 secondaries, 4 tertials, 7 retrices, and 200 contour feathers. Evidence of singe on several tips of primaries and secondaries and to some contour feathers.	Scorched or singed	1	3	Heliostat	637344, 3938094	NA
2017_321_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/2/2017	10/2/2017	Feather spot	3-6 days	Feather spot size small consisting of 5 rectrices and 1 contour feather. No evidence of collision or singe.	Unknown		3	Heliostat	637482, 3938124	NA

2017_322_ISEGS	Lesser Goldfinch	LEGO	Carcass Survey	10/2/2017	10/2/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. No evidence of collision or singe.	Unknown		3	Powerblock	637467, 3937990	NA
2017_323_ISEGS	Chipping Sparrow	CHSP	Carcass Survey	10/2/2017	10/2/2017	Feather spot	3-6 days	Feather spot size large consisting of 35 flight feathers, 40 body feathers. No evidence of collision or singe.	Unknown		3	Heliostat	637483, 3938135	NA
2017_324_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/3/2017	10/3/2017	Broken up	3-6 days	Broken up carcass consisting of a partial right wing. Evidence of singe on tips of flight feathers.	Scorched or singed	1	2	Heliostat	638468, 3935733	NA

2017_325_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/3/2017	10/3/2017	Broken up	3-6 days	Broken up carcass consisting of 4 primaries attached together by dried flesh, 5 retrices, 18 miscellaneous flight feathers, and 15 contour feathers. Evidence of singe on several retrices.	Scorched or singed	2	2	Heliostat	638791, 3936007	NA
2017_326_ISEGS	Brown-headed Cowbird	BHCO	Incidental	10/3/2017	10/3/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe on primaries, secondaries, and rects.	Scorched or singed	1	2	Powerblock	638660, 3935845	NA

2017_327_ISEGS	Yellow-rumped Warbler	YRWA	Incidental	10/3/2017	10/3/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to tail feathers, singe to left flank.	Scorched or singed	1	2	Powerblock	638550, 3935902	NA
2017_328_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/4/2017	10/4/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to primaries and secondaries, retrice feathers singed off, singe to head and all underparts.	Scorched or singed	2	2	Powerblock	638662, 3935872	NA

2017_329_ISEGS	White-Crowned Sparrow	WCSP	Carcass Survey	10/4/2017	10/4/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence or curling to primaries, secondaries and retrices, singe to top of head, all upperparts, and left flank.	Scorched or singed	2	2	ACC Building	638675, 3935882	NA
2017_330_ISEGS	House Finch	HOFI	Carcass Survey	10/4/2017	10/4/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to tertials on left wing and retrices, singe to left and right side of face, nape, left upper breast, rump, and undertail coverts.	Scorched or singed	1	1	ACC Building	640411, 3933522	NA

2017_331_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/4/2017	10/4/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries and secondaries, rect feathers singed off, singe to entire body except throat.	Scorched or singed	2	2	ACC Building	638659, 3935895	NA
2017_332_ISEGS	Black-throated Gray Warbler	BTYW	Carcass Survey	10/4/2017	10/4/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of singe to all parts of body except undertail coverts with all major flight feathers singed off.	Scorched or singed	2	1	ACC Building	640418, 3933535	NA

2017_333_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/4/2017	10/4/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to all major flight feathers in wings and tail, singe to upper breast, head, coverts, rump, and axillaries.	Scorched or singed	2	1	ACC Building	640399, 3933534	NA
2017_334_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/4/2017	10/4/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries, secondaries, and retrices, singe to top of head, sides of face, throat, entire breast, and uppertail coverts.	Scorched or singed	2	1	ACC Building	640389, 3933547	NA

2017_335_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/4/2017	10/4/2017	Broken up	3-6 days	Broken up carcass consisting of piece of right wing. Evidence of singe on tips of secondaries and some coverts.	Scorched or singed	1	2	Powerblock	638687, 3935891	NA
2017_336_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/4/2017	10/4/2017	Feather spot	3-6 days	Feather spot size small consisting of 12 contour feathers. Evidence of singe on tips of most feathers.	Scorched or singed	3	2	Powerblock	638683, 3935868	NA
2017_337_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/4/2017	10/4/2017	Feather spot	3-6 days	Feather spot size small consisting of 20 contour feathers. Evidence of singe on most feathers.	Scorched or singed	3	1	Powerblock	640357, 3933487	NA

2017_338_ISEGS	Unknown Swallow	UNSW	Carcass Survey	10/4/2017	10/4/2017	Feather spot	2 weeks	Feather spot size small consisting of 4 primaries, 6 rects, and 4 contour feathers. Evidence of singe on all feathers.	Scorched or singed	1	1	Powerblock	640376, 3933489	NA
2017_339_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/4/2017	10/4/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to all major flight feathers, singe to back and to right flank.	Scorched or singed	2	2	Powerblock	638635, 3935855	NA

2017_340_ISEGS	Unknown Swallow	UNSW	Carcass Survey	10/4/2017	10/4/2017	Feather spot	3-6 days	Feather spot size small consisting of 1 primary, 1 secondary, 1 covert, and 20 contour feathers. No evidence of collision or singe.	Unknown	1	Powerblock	640349, 3933505	NA
2017_341_ISEGS	Unknown Small Bird	UNID	Carcass Survey	10/4/2017	10/4/2017	Broken up	3-6 days	Broken up carcass consisting of partial right wing. No evidence of collision or singe.	Unknown	1	Powerblock	640274, 3933542	NA

2017_342_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/5/2017	10/5/2017	Feather spot	3-6 days	Feather spot size small consisting of 9 body feathers, 1 secondary, 2 primaries, and 3 rectrices. Evidence of curling to the primary and all rects.	Scorched or singed	Unk	1	Heliostat	640174, 3933456	NA

2017_343_ISEGS	Rose-breasted Grosbeak	RBGR	Carcass Survey	10/5/2017	10/5/2017	Feather spot	3-6 days	Feather spot size large consisting of 3 primaries, 2 secondaries, 1 tertial, 2 rectrices, and 50 contour feathers. Evidence of collision with imprint matching size of bird directly above feather spot. Evidence of curling to all flight feathers.	Scorched or singed	2	1	Heliostat	640313, 3933391	NA

2017_344_ISEGS	Northern Mockingbird	NOMO	Carcass Survey	10/5/2017	10/5/2017	Broken up	1 month +	Broken up carcass consisting of partial tail, partial right wing, 1 leg, body cavity, tip of left wing, 8 rects, and 1 primary. Evidence of singe on edge and tips of some rects and secondaries.	Scorched or singed	1	1	Heliostat	640519, 3933395	NA
2017_345_ISEGS	Chipping Sparrow	CHSP	Carcass Survey	10/5/2017	10/5/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of collision with imprint present matching size and shape of species.	Collision with solar panel/heliostat	1		Heliostat	640358, 3933674	NA

2017_346_ISEGS	Cooper's Hawk	COHA	Incidental	10/7/2017	10/7/2017	Dead, fresh (eyes moist)	0-8 hours	Injured bird which was captured on site and later died a rehab facility. No evidence of collision or singe.	Unknown		1	Project Feature	639521, 3934237	NA
2017_347_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/9/2017	10/9/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to primaries and end of rectrices.	Scorched or singed	2	2	ACC Building	638653, 3935913	NA
2017_348_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/9/2017	10/9/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of curling to all flight feathers in wing and tail, singe to head, nape, back, and flanks.	Scorched or singed	2	2	ACC Building	638637, 3935911	NA

2017_349_ISEGS	Violet-green Swallow	VGSW	Carcass Survey	10/9/2017	10/9/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to all major flight feathers in wing with feathers in rects singed off, singe to top of head, back, uppertail coverts, left flank and throat.	Scorched or singed	2	3	ACC Building	637499, 3937959	NA
2017_350_ISEGS	Unknown Bird	UNBD	Carcass Survey	10/9/2017	10/9/2017	Broken up	1 month +	Broken up carcass consisting of 8 vertebrae with both dried skin and contour feathers attached. No evidence of collision or singe.	Unknown		2	Powerblock	638633, 3935918	NA

2017_351_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/9/2017	10/9/2017	Broken up	3-6 days	Broken up carcass consisting of 3 primaries and 1 covert attached by flesh. Evidence of curling to tips of primaries.	Scorched or singed	Unk	2	Powerblock	638688, 3935871	NA
2017_352_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/9/2017	10/9/2017	Feather spot	3-6 days	Feather spot size small consisting of 15 body feathers and 1 flight feather. Evidence of singe on flight feather and 1 body feather.	Scorched or singed	Unk	2	Powerblock	638644, 3935863	NA

2017_353_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/9/2017	10/9/2017	Feather spot	3-6 days	Feather spot size large consisting of 1 primary, 17 body feathers, and 1 covert. Evidence of singe on primary.	Scorched or singed	Unk	2	Powerblock	638660, 3935855	NA
2017_354_ISEGS	Ruby-crowned Kinglet	RCKI	Carcass Survey	10/9/2017	10/9/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe is visible on the throat and breast. Curling visible on 3 retricies.	Scorched or singed	1	2	Powerblock	638678, 3935837	NA

2017_355_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/9/2017	10/9/2017	Feather spot	3-6 days	Featherspot consisting of 40+ body feathers, 2 unidentified flight feathers. Evidence of singe is visible to several body feathers and both flight feathers. Curling to 1 flight feather.	Scorched or singed	Unk	3	Powerblock	637459, 3937941	NA
2017_356_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/9/2017	10/9/2017	Feather spot	3-6 days	Featherspot consisting of 10 body feathers, 1 primary, and 1 covert. Evidence of singe on 3 body feathers.	Scorched or singed	Unk	2	Powerblock	638694, 3935937	NA

2017_357_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/9/2017	10/9/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass with evidence of singe. Curling to all major flight feathers in wing and tail. Singe on the right side of face, nape, right and left flank.	Scorched or singed	2	3	Powerblock	637534, 3937918	NA
2017_358_ISEGS	House Wren	HOWR	Carcass Survey	10/9/2017	10/9/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass, evidence of collision. Apparent injury to the back of the skull with no evidence of singe.	Collision with solar panel/heliostat		3	Powerblock	637463, 3937935	NA

2017_359_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/10/2017	10/10/2017	Feather spot	3-6 days	Feather spot size large consisting of 5 primaries, 1 secondary, 1 retrix, and 8 body feathers. Evidence of singe on secondary and 1 primary.	Scorched or singed	Unk	3	Heliostat	637379, 3937753	NA

2017_360_ISEGS	Cooper's Hawk	COHA	Carcass Survey	10/11/2017	10/11/2017	Broken up	2 days	Broken up carcass consisting of torso with detached head, 150 loose body feathers, clump of feathers attached by dried skin. Evidence of collision with broken beak.	Collision with solar panel/heliostat	2	Heliostat	638869, 3935916	NA

2017_361_ISEGS	Violet-green Swallow	VGSW	Carcass Survey	10/12/2017	10/12/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to all flight feathers in wings with feathers in tail singed off, singe to all of dorsal side, axillaries and both flanks, and undertail coverts.	Scorched or singed	2	1	ACC Building	640414, 3933521	NA

2017_362_ISEGS	Violet-green Swallow	VGSW	Carcass Survey	10/12/2017	10/12/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to all flight feathers in wings with feathers in tail singed off, singe to top of head, back, rump, and undertail coverts.	Scorched or singed	2	1	ACC Building	640398, 3933522	NA

2017_363_ISEGS	House Finch	HOFI	Carcass Survey	10/12/2017	10/12/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of curling to all flight feathers in wings with tail singed off, singe to right side of face, back, breast, right side of rump.	Scorched or singed	2	1	ACC Building	640376, 3933522	NA
2017_364_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/12/2017	10/12/2017	Broken up	3-6 days	Broken up carcass consisting of 1 primary and 1 covert attached by dried flesh, 2 loose primaries. No evidence of collision or singe.	Unknown		1	Heliostat	640406, 3933722	NA

2017_365_ISEGS	Northern Mockingbird	NOMO	Carcass Survey	10/12/2017	10/12/2017	Broken up	2 weeks	Broken up carcass consisting of partial right wing. No evidence of collision or singe.	Unknown	1	Heliostat	640410, 3933298	NA
2017_366_ISEGS	Western Tanager	WETA	Carcass Survey	10/12/2017	10/12/2017	Feather spot	2 days	Feather spot size large consisting of 2 retrices, 3 primaries, 6 secondaries, 1 tertials, 1 trailing secondary, 1 undertail covert, and 40 body feathers. No evidence of collision or singe.	Unknown	1	Heliostat	640307, 3933358	NA

2017_367_ISEGS	Unknown Warbler	UNWA	Carcass Survey	10/12/2017	10/12/2017	Feather spot	3-6 days	Feather spot size large consisting of 2 primaries, 2 rects, 2 flight feathers, 7 contour feathers, and 3 undertail coverts. Evidence of curling to most of flight feathers.	Scorched or singed	1	1	Powerblock	640362, 3933495	NA
2017_368_ISEGS	Unknown Swallow	UNSW	Carcass Survey	10/12/2017	10/12/2017	Feather spot	1 month +	Feather spot size small consisting of 6 primaries and 2 secondaries. Evidence of singe to 1 primary.	Scorched or singed	Unk	1	Powerblock	640373, 3933493	NA

2017_369_ISEGS	Swainson's Thrush	SWTH	Carcass Survey	10/12/2017	10/12/2017	Broken up	3-6 days	Broken up carcass consisting of 4 primaries, 1 secondary, 1 flight feather, 1 undertail covert, 200 body feathers, and broken beak. No evidence of collision or singe.	Unknown	1	Heliostat	640466, 3933333	NA
2017_370_ISEGS	Unknown Blackbird	UNBB	Carcass Survey	10/12/2017	10/12/2017	Broken up	3-6 days	Broken up carcass consisting of partial left wing, 2 loose primaries. No evidence of collision or singe.	Unknown	1	Powerblock	640249, 3933542	NA

2017_371_ISEGS	Savannah Sparrow	SAVS	Carcass Survey	10/12/2017	10/12/2017	Feather spot	2 days	Feather spot size large consisting of 18 primaries, 15 secondaries 11 rectrices, and 200 body feathers. Evidence of collision with heliostat imprint matching size and shape of species.	Collision with solar panel/heliostat	1	Heliostat	640584, 3933616	NA
2017_372_ISEGS	Unknown Sparrow	UNSP	Carcass Survey	10/12/2017	10/12/2017	Feather spot	2 days	Feather spot size large consisting of 1 primary and 50 body feathers. No evidence of collision or singe.	Unknown	1	Heliostat	640444, 3933655	NA

2017_373_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/16/2017	10/16/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass; Evidence of singe in the throat, breast, belly, and crown. Curling to retricies and 10 flight feathers.	Scorched or singed	2	3	ACC Building	637473, 3937945	NA
2017_374_ISEGS	Chipping Sparrow	CHSP	Carcass Survey	10/16/2017	10/16/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass; evidence of singe on breast, head, and face. Tips of some primaries and rects singed. Broken Neck.	Scorched or singed	1	3	ACC Building	637514, 3937958	NA
2017_375_ISEGS	Red-breasted Nuthatch	RBNU	Carcass Survey	10/16/2017	10/16/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass, no evidence of singe of collision.	Unknown		3	ACC Building	637468, 3937967	NA

2017_376_ISEGS	Unknown Sparrow	UNSP	Carcass Survey	10/16/2017	10/16/2017	Feather spot	3-6 days	Feather spot size large consisting of 15 retrices, 1 retrix, 7 contour feathers, 2 secondaries, 2 flight feathers. Evidence of curling to 1 flight feather and 1 retrix.	Scorched or singed	Unk	3	Heliostat	637435, 3937722	NA

2017_377_ISEGS	Unidentified Woodpecker	UNWO	Carcass Survey	10/16/2017	10/16/2017	Broken up	3-6 days	Broken up carcass consisting of 2 primaries, 4 secondaries, and 3 body feathers. Secondaries connected by flesh. Evidence of singe. All flight feathers curled. Body feathers singed.	Scorched or singed	Unk	3	Powerblock	637408, 3937896	NA

2017_378_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/16/2017	10/16/2017	Feather spot	3-6 days	Feather spot size small consisting of 3 primaries, 1 unidentified flight feather and 2 contour feathers. Evidence of singe on tips of primaries and contours.	Scorched or singed	1	3	Heliostat	637370, 3937795	NA
2017_379_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/16/2017	10/16/2017	Feather spot	2 days	Feather spot size small consisting of 22 contour feathers. Evidence of singe on all contour feathers.	Scorched or singed	Unk	3	Powerblock	637462, 3937928	NA

2017_380_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/16/2017	10/16/2017	Broken up	2 days	Broken up carcass consisting of partial right wing. Evidence of curling to all flight feathers.	Scorched or singed	Unk	3	Powerblock	637445, 3937952	NA
2017_381_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/16/2017	10/16/2017	Broken up	3-6 days	Broken up carcass consisting of a partial right wing. No evidence of singe or collision.	Unknown		3	Powerblock	637446, 3937952	NA
2017_382_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/17/2017	10/17/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass; Evidence of singe. All flight feathers singed or curled. All upperparts singed.	Scorched or singed	2	2	ACC Building	638702, 3935895	NA

2017_383_ISEGS	Pine Siskin	PISI	Carcass Survey	10/17/2017	10/17/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	2 weeks	Whole carcass, evidence of singe on tips of primaries and rects.	Scorched or singed	1	2	Powerblock	638628, 3935924	NA
2017_384_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/17/2017	10/17/2017	Broken up	3-6 days	Broken up carcass consisting of the right wing with flesh and bone still attached. Evidence of singe. Primaries and secondaries curled and singed. Coverts have slight singe.	Scorched or singed	Unk	2	Powerblock	638648, 3935872	NA

2017_385_ISEGS	Unidentified Accipiter	UNAC	Carcass Survey	10/17/2017	10/17/2017	Feather spot	3-6 days	Feather spot size large consisting of 38 contour feathers. No evidence of singe or collision.	Unknown		2	Heliostat	638861, 3935941	NA
2017_386_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/17/2017	10/17/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass; evidence of singe on head and breast. Primaries and rectricies with slight curling.	Scorched or singed	2	2	Powerblock	638630, 3935851	NA
2017_387_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/17/2017	10/17/2017	Feather spot	3-6 days	Feather spot size small consisting of 2 primaries, 1 secondary, 1 tertial	Scorched or singed	2	2	Powerblock	638632, 3935850	NA
2017_388_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/17/2017	10/17/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass; evidence of curling on tips of rects.	Scorched or singed	1	2	Powerblock	638636, 3935847	NA

2017_389_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/17/2017	10/17/2017	Broken up	8-24 hours	Broken up carcass consisting of 5 pieces of wing with skin attached, 1 foot, 13 contour feathers, and 16 unidentified flight feathers. Evidence of singe. Curling and singe to 19 flight feathers, singe to 7 contour feathers.	Scorched or singed	Unk	2	Powerblock	638643, 3935798	NA

2017_390_ISEGS	Violet-green Swallow	VGSW	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 5 primaries, 4 secondaries, 2 retricies, and 3 contour feathers. Evidence of singe to all flight feathers	Scorched or singed	Unk	1	Heliostat	640172, 3933508	NA
2017_391_ISEGS	Vesper Sparrow	VESP	Carcass Survey	10/18/2017	10/18/2017	Broken up	0-8 hours	Broken up carcass consisting of 20 primaries, 14 secondaries, 12 rects, and partial torso with leg. 350+ contour feathers. No evidence of singe or collision.	Unknown		1	Heliostat	640345, 3933382	NA

2017_392_ISEGS	Yellow Warbler	YWAR	Carcass Survey	10/18/2017	10/18/2017	Feather spot	2 weeks	Feather spot size small consisting of 1 primary and 21 contour feathers. Evidence of singe on edges of primary feather.	Scorched or singed	1	1	Heliostat	640349, 3933379	NA
2017_393_ISEGS	Wilson's Warbler	WIWA	Carcass Survey	10/18/2017	10/18/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe to head, nape, rump, back, flanks, rects, and wings. Curling to left wing and rects. Upper mandible broken off.	Scorched or singed	2	1	ACC Building	640368, 3933534	NA

2017_394_ISEGS	Chipping Sparrow	CHSP	Carcass Survey	10/18/2017	10/18/2017	Dead, fresh (eyes moist)	8-24 hours	Whole carcass with evidence of singe to the head, neck, and left flank. Singe and curling to left wing and tail.	Scorched or singed	1	1	ACC Building	640368, 3933534	NA
2017_395_ISEGS	Unidentified Finch	UNFI	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 60+ contour feathers and 5 coverts. Evidence of singe on most contour feathers.	Scorched or singed	3	1	Heliostat	640383, 3933381	NA

2017_396_ISEGS	Black-Headed Grosbeak	BHGR	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 2 primaries, 1 secondary, 2 rects and 2 contours. Evidence of singe; all flight feathers curled.	Scorched or singed	2	1	Heliostat	640295, 3933346	NA
2017_397_ISEGS	Wilson's Warbler	WIWA	Carcass Survey	10/18/2017	10/18/2017	Dead, Semi-fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass. Evidence of singe. Singe on tips of rects and some primaries/secondaries.	Scorched or singed	3	1	ACC Building	640397, 3933541	NA

2017_398_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 11 primaries, 11 secondaries, 2 tertials, and 1 unidentified flight feather. Evidence of singe on most flight feathers. 2 secondaries and 1 primary curled.	Scorched or singed	1	1	Heliostat	640322, 3933350	NA

2017_399_ISEGS	Orange-crowned Warbler	OCWA	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 8 primaries, 7 secondaries, 7 retricies, and 75+contour feathers. Evidence of singe; 1 primary curled. Some primaries, secondaries, and rects singed on edges. Some contours singed.	Scorched or singed	1	1	Heliostat	640329, 3933343	NA

2017_400_ISEGS	Northern Mockingbird	NOMO	Carcass Survey	10/18/2017	10/18/2017	Broken up	1 month +	Broken up carcass consisting of 11 primaries, 5 of which are attached together by skin, 13 secondaries +3 with bone attached, 2 retricies, and 2 contours. Evidence of singe on 23 flight feathers and 2 contour feathers.	Scorched or singed	Unk	1	Heliostat	640326, 3933334	NA

2017_401_ISEGS	Unidentified Woodpecker	UNWO	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of mandibles, 26 unidentified flight feathers and 200+ contour feathers. Evidence of singe; All flight feathers webbing singed off, most contours have singe.	Scorched or singed	Unk	1	Powerblock	640374, 3933509	NA

2017_402_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of the right wing, a partial left wing, and 40 contour feathers. Evidence of singe. All right wing feathers curled or singed off. Most contours singed.	Scorched or singed	2	1	Heliostat	640374, 3933345	NA

2017_403_ISEGS	Black-Throated Sparrow	BTSP	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of 3 primaries, 7 secondaries (2 coverts attached), 8 rects, 9 contours, 20+contours with skin attached, and 2 unknown flight feathers. Evidence of singe; 2 curled rects, 1 singed primary, singed clump of 20 contours, and curl	Scorched or singed	Unk	1	Powerblock	640379, 3933511	NA

2017_404_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of the posterior half of the carcass (lower torso & legs). Evidence of singe. All attatched feathers singed	Scorched or singed	Unk	1	Heliostat	640335, 3933303	NA
2017_405_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 100+ contour feathers. No evidence of collision or singe.	Unknown		1	Powerblock	640402, 3933503	NA

2017_406_ISEGS	Unidentified Woodpecker	UNWO	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather Spot size large consisting of 8 retricies, 20 primaries, 10 secondaries, 4 unknown flight feathers, and 300+ contour feathers. Evidence of singe. All flight feathers singed, 5 primaries curled, many contour feathers singed.	Scorched or singed	Unk	1	Powerblock	640383, 3933578	NA
2017_407_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 20 contour feathers. Evidence of singe on 13 of the 20 contour feathers.	Scorched or singed	Unk	1	Powerblock	640322, 3933592	NA

2017_408_ISEGS	Fox Sparrow	FOSP	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 14 contour feathers. No evidence of singe or collision.	Unknown	1	Powerblock	640311, 3933418	NA
2017_409_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	2 days	Feather spot size small consisting of 13 contour feathers. No evidence of singe or collision.	Unknown	1	Heliostat	640540, 3933544	NA

2017_410_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 4 primaries, 1 retrix, 1 secondary, and 7 contours. Evidence of singe. Rect curled; all flight feathers singed, and secondary curled.	Scorched or singed	Unk	1	Powerblock	640348, 3933420	NA
2017_411_ISEGS	Savannah Sparrow	SAVS	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 17 primaries, 11 secondaries, 11 rects, and 100+ contour/covert feathers. No evidence of singe or collision.	Unknown		1	Heliostat	640611, 3933573	NA

2017_412_ISEGS	Unidentified Swallow	UNSW	Carcass Survey	10/18/2017	10/18/2017	Feather spot	2 days	Feather spot size large consisting of 70 contour feathers, 1 primary, and 1 retrix. Evidence of singe; Singe is present on all contour feathers.	Scorched or singed	Unk	1	Heliostat	640275, 3933651	NA
2017_413_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 1 primary and 30 contour feathers. Evidence of singe on contour feathers. Primary is curled.	Scorched or singed	2	1	Powerblock	640390, 3933469	NA

2017_414_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	2 weeks	Feather spot size small consisting of 9 retricies. Evidence of singe on retricies.	Scorched or singed	Unk	1	Powerblock	640304, 3933480	NA
2017_415_ISEGS	Unidentified Sparrow	UNSP	Carcass Survey	10/18/2017	10/18/2017	Feather spot	2 days	Feather spot size large consisting of 1 primary, 5 secondaries, 4 retricies, and 45+ contour feathers. No evidence of singe or collision.	Unknown		1	Heliostat	640503, 3933648	NA

2017_416_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 4 rects, 1 tertial, and 40+ contours and coverts. Evidence of singe on tips of rects and tertials.	Scorched or singed	1	1	Heliostat	640380, 3933704	NA

2017_417_ISEGS	Unidentified Duck	UNDU	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of 4 pieces of right wing (flight feathers with skin and bone attached), 7 secondaries, 5 contours, 2 unknown flight feathers, and 3 unknown bones. No evidence of singe or collision.	Unknown	1	Powerblock	640314, 3933553	NA

2017_418_ISEGS	House Finch	HOFI	Incidental	10/18/2017	10/18/2017	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of singe on cheek, throat, breast, flanks, and rump. Wings and tail singed and curled.	Scorched or singed	2	3	Powerblock	637492, 3937927	NA

2017_419_ISEGS	Yellow-rumped Warbler	YRWA	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size large consisting of 6 primaries, 5 secondaries, 1 tertial, 2 rects, 1 unidentified flight feather, and 4 contours. Evidence of singe; 2 primaries curled. All other flight feathers are singed on the edges.	Scorched or singed	1	1	Heliostat	640329, 3933343	NA

2017_420_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Feather spot	3-6 days	Feather spot size small consisting of 2 primaries, 5 retricies, and 4 secondaries. Evidence of singe on 2 of the retricies.	Scorched or singed	Unk	1	Heliostat	640295, 3933346	NA
2017_421_ISEGS	Unidentified Small Bird	UNID	Carcass Survey	10/18/2017	10/18/2017	Broken up	3-6 days	Broken up carcass consisting of a partial left wing. Evidence of singe; Flight feathers singed off. Coverts singed.	Scorched or singed	2	1	Heliostat	640295, 3933346	NA

2017_158_ISEGS	Unknown Warbler	UNWA	Incidental	8/18/2017	8/18/2017	Dead, Fresh	8-24 hours	Whole carcass. Evidence of singe to all parts of body except for lower flanks, all flight feathers singed off.	Scorched or singed	2	2	Powerblock	638660, 3935845	NA

Appendix B. Additional Detection Data for Fatality Estimates and Documentation of Fatality Estimates in which Each Detection was Included.

USFWS #	Species Code	Location	Distance from Tower (m)	Bird Size	Model Size	Cause of Death	How Found	Time Since Last Survey (days)	Used in Estimator	Tower Area	Power Block	Inner HD	Heliostat Area	Estimator Notes
2017_158_ISEGS	UNWA	Outside Search - Tower	0	Small	Small Carcass	singed	Incidental	NA	No					Outside Standard Search Area
2017_159_ISEGS	BHCO	Power Block	39	Small	Small Carcass	singed	Incidental	1(1)	No	X	X			Older than Search Interval
2017_160_ISEGS	CHSP	Power Block	55	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X			
2017_161_ISEGS	CLSW	Power Block	72	Small	Small Carcass	singed	Incidental	1(1)	No	X	X			Older than Search Interval
2017_162_ISEGS	TEAL	Inner HD	186	Large	Feather Spot	unknown	Fatality Search	20	Yes	X		X		
2017_163_ISEGS	UNWA	Inner HD	162	Small	Feather Spot	singed	Fatality Search	20	Yes	X		X		
2017_164_ISEGS	WTSW	Inner HD	185	Small	Feather Spot	singed	Fatality Search	20	Yes	X		X		
2017_165_ISEGS	YWAR	ACC	39	Small	Small Carcass	singed	Fatality Search	22	Yes	X	X			
2017_166_ISEGS	YWAR	ACC	58	Small	Small Carcass	singed	Fatality Search	22	Yes	X	X			
2017_167_ISEGS	BHCO	ACC	58	Small	Small Carcass	singed	Fatality Search	22	Yes	X	X			
2017_168_ISEGS	YWAR	Power Block	66	Small	Small Carcass	singed	Fatality Search	22	Yes	X	X			
2017_169_ISEGS	UNID	Power Block	68	Small	Feather Spot	singed	Fatality Search	20	Yes	X	X			

2017_170_ISEGS	BTGN	Power Block	31	Small	Small Carcass	singed	Fatality Search	22	Yes	X	X		
2017_171_ISEGS	UNID	Power Block	39	Small	Feather Spot	singed	Fatality Search	22	Yes	X	X		
2017_172_ISEGS	UNSW	Power Block	39	Small	Feather Spot	singed	Fatality Search	22	Yes	X	X		
2017_173_ISEGS	NRWS	Power Block	114	Small	Feather Spot	singed	Fatality Search	22	Yes	X	X		
2017_174_ISEGS	ROPI	Power Block	93	Large	Large Carcass	singed	Fatality Search	20	Yes	X	X		
2017_175_ISEGS	YWAR	ACC	64	Small	Small Carcass	singed	Fatality Search	23	Yes	X	X		
2017_176_ISEGS	NAWA	ACC	50	Small	Small Carcass	singed	Fatality Search	23	Yes	X	X		
2017_177_ISEGS	TRES	ACC	58	Small	Small Carcass	singed	Fatality Search	23	Yes	X	X		
2017_178_ISEGS	BHCO	ACC	46	Small	Small Carcass	singed	Fatality Search	23	Yes	X	X		
2017_179_ISEGS	NRWS	Inner HD	217	Small	Feather Spot	singed	Fatality Search	20	Yes	X		X	
2017_180_ISEGS	LAZB	Power Block	56	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_181_ISEGS	NRWS	Power Block	68	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_182_ISEGS	YWAR	Power Block	69	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_183_ISEGS	UNWA	Power Block	24	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval
2017_184_ISEGS	BHCO	Inner HD	180	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_185_ISEGS	YWAR	ACC	32	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_186_ISEGS	BRSP	ACC	45	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_187_ISEGS	BRSP	ACC	48	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		

2017_188_ISEGS	UNSW	ACC	59	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_189_ISEGS	HEWA	ACC	71	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_190_ISEGS	UNID	Power Block	113	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_191_ISEGS	YWAR	Inner HD	228	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_192_ISEGS	BANS	ACC	45	Small	Small Carcass	collision	Fatality Search	7	Yes	X	X		
2017_193_ISEGS	AMKE	Power Block	125	Large	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_194_ISEGS	YWAR	Power Block	73	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_195_ISEGS	UNID	Power Block	34	Small	Feather Spot	unknown	Fatality Search	7	No	X	X		Older than Search Interval
2017_196_ISEGS	WIWA	Power Block	26	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_197_ISEGS	UNWA	Power Block	28	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_198_ISEGS	NAWA	ACC	53	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_199_ISEGS	UNWA	ACC	52	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_200_ISEGS	UNSP	ACC	54	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_201_ISEGS	UNSW	Power Block	19	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval
2017_202_ISEGS	UNID	Power Block	83	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		

2017_203_ISEGS	UNHU	ACC	63	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_204_ISEGS	UNID	Power Block	48	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		
2017_205_ISEGS	TOWA	Power Block	7	Small	Small Carcass	unknown	Fatality Search	8	Yes	X	X		
2017_206_ISEGS	MODO	Power Block	21	Large	Large Carcass	unknown	Incidental	1(1)	Yes	X	X		
2017_207_ISEGS	YWAR	ACC	51	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_208_ISEGS	NRWS	ACC	36	Small	Small Carcass	other (entrapment)	Fatality Search	8	Yes	X	X		
2017_209_ISEGS	RUHU	ACC	33	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_210_ISEGS	WETA	Inner HD	228	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_211_ISEGS	BHCO	ACC	52	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_212_ISEGS	UNSW	Power Block	10	Small	Feather Spot	singed	Fatality Search	8	No	X	X		Older than Search Interval
2017_213_ISEGS	NOMO	Power Block	22	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		
2017_214_ISEGS	BHCO	Inner HD	225	Small	Small Carcass	collision	Fatality Search	7	Yes	X		X	
2017_215_ISEGS	UNID	Inner HD	131	Small	Feather Spot	unknown	Fatality Search	7	No	X		X	Older than Search Interval
2017_216_ISEGS	BTSP	Power Block	0	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval

2017_217_ISEGS	TRES	Power Block	0	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval
2017_218_ISEGS	BTSP	Outside Search - Tower	0	Small	Small Carcass	singed	Incidental	NA	No				Outside Standard Search Area
2017_219_ISEGS	BHCO	Power Block	0	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval
2017_220_ISEGS	BUOR	Power Block	0	Small	Small Carcass	unknown	Incidental	1(1)	No	X	X		Older than Search Interval
2017_221_ISEGS	BRSP	ACC	41	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_222_ISEGS	YWAR	Power Block	41	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_223_ISEGS	UNID	Inner HD	161	Small	Feather Spot	singed	Fatality Search	8	Yes	X		X	
2017_224_ISEGS	UNID	Inner HD	198	Small	Feather Spot	singed	Fatality Search	8	Yes	X		X	
2017_225_ISEGS	NRWS	Power Block	27	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_226_ISEGS	YHBL	Inner HD	217	Small	Small Carcass	collision	Fatality Search	8	Yes	X		X	
2017_227_ISEGS	UNID	ACC	65	Small	Small Carcass	other (entrapment)	Fatality Search	7	Yes	X	X		
2017_228_ISEGS	WIWA	ACC	38	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_229_ISEGS	UNWA	Power Block	37	Small	Feather Spot	unknown	Fatality Search	7	No	X	X		Older than Search Interval

2017_230_ISEGS	UNID	Power Block	30	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_231_ISEGS	UNGR	Inner HD	248	Large	Feather Spot	singed	Fatality Search	8	No	X		X	Older than Search Interval
2017_232_ISEGS	TRES	ACC	39	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_233_ISEGS	VERD	ACC	45	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_234_ISEGS	BTGN	ACC	60	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_235_ISEGS	UNSW	Power Block	23	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_236_ISEGS	UNID	Power Block	33	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_237_ISEGS	BUOR	Power Block	28	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_238_ISEGS	VGSW	ACC	40	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_239_ISEGS	NAWA	ACC	60	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_240_ISEGS	YWAR	Power Block	60	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_241_ISEGS	YWAR	ACC	62	Small	Small Carcass	other (entrapment)	Incidental	1	Yes	X	X		
2017_242_ISEGS	BRSP	Power Block	31	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_243_ISEGS	UNID	Power Block	76	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_244_ISEGS	UNID	Power Block	22	Small	Small Carcass	singed	Fatality Search	6	No	X	X		Older than Search Interval
2017_245_ISEGS	NAWA	ACC	69	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		

2017_246_ISEGS	UNID	Power Block	20	Small	Feather Spot	unknown	Fatality Search	6	Yes	X	X			
2017_247_ISEGS	ROPI	Power Block	28	Large	Large Carcass	singed	Fatality Search	6	Yes	X	X			
2017_248_ISEGS	YWAR	Power Block	91	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X			
2017_249_ISEGS	LAZB	Power Block	92	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X			
2017_250_ISEGS	UNID	Power Block	31	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X			
2017_251_ISEGS	UNID	Power Block	18	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X			
2017_252_ISEGS	LAZB	Power Block	42	Small	Small Carcass	unknown	Incidental	1(1)	Yes	X	X			
2017_253_ISEGS	UNID	Inner HD	142	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X		
2017_254_ISEGS	YWAR	Inner HD	155	Small	Feather Spot	singed	Fatality Search	7	No	X		X		Older than Search Interval
2017_255_ISEGS	GTTO	Inner HD	266	Small	Feather Spot	collision	Fatality Search	7	Yes	X		X		
2017_256_ISEGS	RUHU	Power Block	42	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X			
2017_257_ISEGS	UNID	Power Block	42	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X			
2017_258_ISEGS	UNGR	Inner HD	243	Large	Feather Spot	unknown	Fatality Search	7	Yes	X		X		
2017_259_ISEGS	VERD	Power Block	70	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X			
2017_260_ISEGS	UNID	Power Block	112	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X			
2017_261_ISEGS	LASP	Inner HD	155	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X		
2017_262_ISEGS	UNID	Power Block	112	Small	Small Carcass	unknown	Fatality Search	7	No	X	X			Older than Search Interval

2017_263_ISEGS	YWAR	Power Block	97	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	
2017_264_ISEGS	BGGN	Inner HD	165	Small	Small Carcass	singed	Fatality Search	7	Yes	X		X
2017_265_ISEGS	LAZB	Power Block	4	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X	
2017_266_ISEGS	YWAR	ACC	50	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_267_ISEGS	TOWA	ACC	63	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_268_ISEGS	YWAR	ACC	62	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_269_ISEGS	UNFL	ACC	83	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_270_ISEGS	UNID	Power Block	79	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	
2017_271_ISEGS	UNWA	Power Block	31	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X	
2017_272_ISEGS	UNID	Power Block	27	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X	
2017_273_ISEGS	NAWA	Inner HD	222	Small	Small Carcass	unknown	Fatality Search	6	Yes	X		X
2017_274_ISEGS	BARS	Inner HD	150	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X
2017_275_ISEGS	UNID	Power Block	23	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	
2017_276_ISEGS	UNID	Power Block	20	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_277_ISEGS	NRWS	Power Block	16	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	
2017_278_ISEGS	UNSW	Power Block	28	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	
2017_279_ISEGS	YRWA	Inner HD	217	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X
2017_280_ISEGS	OCWA	ACC	64	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X	
2017_281_ISEGS	UNID	Power Block	12	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X	

2017_282_ISEGS	BGGN	Inner HD	238	Small	Small Carcass	singed	Fatality Search	6	Yes	X		X	
2017_283_ISEGS	UNID	Inner HD	246	Small	Feather Spot	unknown	Fatality Search	6	Yes	X		X	
2017_284_ISEGS	RUHU	Power Block	50	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_285_ISEGS	HEWA	Outside Search - TOWER	0	Small	Small Carcass	singed	Incidental	NA	No				Outside Standard Search Area
2017_286_ISEGS	BHCO	Outside Search - Solor Concentration Tower Level 6	0	Small	Small Carcass	singed	Incidental	NA	No				Outside Standard Search Area
2017_287_ISEGS	CHSP	Inner HD	204	Small	Small Carcass	unknown	Incidental	6	Yes	X		X	
2017_288_ISEGS	YWAR	ACC	41	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_289_ISEGS	OCWA	Power Block	107	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_290_ISEGS	BEWR	Inner HD	232	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_291_ISEGS	UNSW	Power Block	25	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_292_ISEGS	UNBD	Inner HD	229	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_293_ISEGS	WTSW	Power Block	88	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_294_ISEGS	UNID	Power Block	89	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_295_ISEGS	UNID	Inner HD	238	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	

2017_296_ISEGS	YRWA	Inner HD	178	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_297_ISEGS	UNWA	Inner HD	178	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_298_ISEGS	MODO	Inner HD	206	Large	Feather Spot	collision	Fatality Search	7	Yes	X		X	
2017_299_ISEGS	UNWA	Power Block	20	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_300_ISEGS	EAGR	Inner HD	129	Large	Large Carcass	unknown	Fatality Search	7	Yes	X		X	
2017_301_ISEGS	HOFI	Power Block	78	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_302_ISEGS	YWAR	Power Block	72	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_303_ISEGS	UNSP	Inner HD	186	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_304_ISEGS	UNID	Inner HD	117	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_305_ISEGS	UNID	Power Block	26	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_306_ISEGS	UNID	Power Block	25	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_307_ISEGS	UNID	Power Block	48	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_308_ISEGS	UNID	Power Block	44	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_309_ISEGS	UNGN	Inner HD	117	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_310_ISEGS	YRWA	Power Block	31	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_311_ISEGS	TOWA	Power Block	29	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_312_ISEGS	BTYW	ACC	47	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		

2017_313_ISEGS	UNHU	ACC	63	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_314_ISEGS	YWAR	Inner HD	231	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_315_ISEGS	WCSP	Inner HD	229	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_316_ISEGS	YWAR	Power Block	59	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_317_ISEGS	WCSP	Inner HD	142	Small	Feather Spot	unknown	Fatality Search	7	No	X		X	Older than Search Interval
2017_318_ISEGS	UNID	Inner HD	127	Small	Feather Spot	singed	Fatality Search	7	No	X		X	Older than Search Interval
2017_319_ISEGS	UNSP	Power Block	37	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_320_ISEGS	HOWR	Inner HD	229	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_321_ISEGS	UNID	Inner HD	207	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_322_ISEGS	LEGO	Power Block	78	Small	Small Carcass	unknown	Fatality Search	7	Yes	X	X		
2017_323_ISEGS	CHSP	Inner HD	218	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_324_ISEGS	UNID	Inner HD	222	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_325_ISEGS	YRWA	Inner HD	208	Small	Feather Spot	singed	Fatality Search	7	Yes	X		X	
2017_326_ISEGS	BHCO	Outside Search - Tower Level 17	0	Small	Small Carcass	singed	Incidental	NA	No				Outside Standard Search Area
2017_327_ISEGS	YRWA	Power Block	123	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		

2017_328_ISEGS	YRWA	Power Block	27	Small	Small Carcass	singed	Incidental	1(1)	No	X	X		Older than Search Interval
2017_329_ISEGS	WCSP	ACC	39	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_330_ISEGS	HOFI	ACC	51	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_331_ISEGS	YRWA	ACC	49	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_332_ISEGS	BTYW	ACC	64	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_333_ISEGS	YRWA	ACC	52	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_334_ISEGS	YRWA	ACC	61	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_335_ISEGS	UNID	Power Block	52	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		
2017_336_ISEGS	UNID	Power Block	32	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		
2017_337_ISEGS	UNID	Power Block	16	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_338_ISEGS	UNSW	Power Block	4	Small	Feather Spot	singed	Fatality Search	7	No	X	X		Older than Search Interval
2017_339_ISEGS	YRWA	Power Block	26	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_340_ISEGS	UNSW	Power Block	28	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_341_ISEGS	UNID	Power Block	112	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_342_ISEGS	YRWA	Inner HD	198	Small	Feather Spot	singed	Fatality Search	8	Yes	X		X	
2017_343_ISEGS	RBGR	Inner HD	115	Small	Feather Spot	singed	Fatality Search	8	Yes	X		X	

2017_344_ISEGS	NOMO	Inner HD	172	Small	Feather Spot	singed	Fatality Search	8	No	X		X	Older than Search Interval
2017_345_ISEGS	CHSP	Inner HD	184	Small	Small Carcass	collision	Fatality Search	8	Yes	X		X	
2017_346_ISEGS	COHA	Unit Fence	1136	Large	Large Carcass	unknown	Incidental	717	No				Older than Search Interval
2017_347_ISEGS	YRWA	ACC	67	Small	Small Carcass	singed	Fatality Search	5	Yes	X	X		
2017_348_ISEGS	YRWA	ACC	68	Small	Small Carcass	singed	Fatality Search	5	Yes	X	X		
2017_349_ISEGS	VGSW	ACC	46	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_350_ISEGS	UNBD	Power Block	78	Small	Feather Spot	unknown	Fatality Search	5	No	X	X		Older than Search Interval
2017_351_ISEGS	UNID	Power Block	41	Small	Small Carcass	singed	Fatality Search	5	Yes	X	X		
2017_352_ISEGS	UNID	Power Block	24	Small	Feather Spot	singed	Fatality Search	5	Yes	X	X		
2017_353_ISEGS	UNID	Power Block	8	Small	Feather Spot	singed	Fatality Search	5	Yes	X	X		
2017_354_ISEGS	RCKI	Power Block	18	Small	Small Carcass	singed	Fatality Search	5	Yes	X	X		
2017_355_ISEGS	UNID	Power Block	28	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_356_ISEGS	UNID	Power Block	97	Small	Feather Spot	singed	Fatality Search	5	Yes	X	X		
2017_357_ISEGS	YRWA	Power Block	47	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_358_ISEGS	HOWR	Power Block	31	Small	Small Carcass	collision	Fatality Search	7	Yes	X	X		
2017_359_ISEGS	UNID	Inner HD	193	Small	Feather Spot	singed	Fatality Search	8	Yes	X		X	

2017_360_ISEGS	COHA	Inner HD	222	Large	Large Carcass	collision	Fatality Search	8	Yes	X		X	
2017_361_ISEGS	VGSW	ACC	53	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_362_ISEGS	VGSW	ACC	42	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_363_ISEGS	HOFI	ACC	34	Small	Small Carcass	singed	Fatality Search	8	Yes	X	X		
2017_364_ISEGS	UNID	Inner HD	235	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_365_ISEGS	NOMO	Inner HD	195	Small	Feather Spot	unknown	Fatality Search	7	No	X		X	Older than Search Interval
2017_366_ISEGS	WETA	Inner HD	146	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_367_ISEGS	UNWA	Power Block	11	Small	Feather Spot	singed	Fatality Search	8	Yes	X	X		
2017_368_ISEGS	UNSW	Power Block	5	Small	Feather Spot	singed	Fatality Search	8	No	X	X		Older than Search Interval
2017_369_ISEGS	SWTH	Inner HD	182	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_370_ISEGS	UNBB	Power Block	135	Small	Feather Spot	unknown	Fatality Search	8	Yes	X	X		
2017_371_ISEGS	SAVS	Inner HD	248	Small	Feather Spot	collision	Fatality Search	7	Yes	X		X	
2017_372_ISEGS	UNSP	Inner HD	182	Small	Feather Spot	unknown	Fatality Search	7	Yes	X		X	
2017_373_ISEGS	YRWA	ACC	33	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_374_ISEGS	CHSP	ACC	50	Small	Small Carcass	singed	Fatality Search	7	Yes	X	X		
2017_375_ISEGS	RBNU	ACC	55	Small	Small Carcass	other (entrapment)	Fatality Search	7	Yes	X	X		

2017_376_ISEGS	UNSP	Inner HD	197	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_377_ISEGS	UNWO	Power Block	81	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_378_ISEGS	UNID	Inner HD	166	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_379_ISEGS	UNID	Power Block	27	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_380_ISEGS	YRWA	Power Block	56	Small	Feather Spot	singed	Fatality Search	7	Yes	X	X		
2017_381_ISEGS	UNID	Power Block	55	Small	Feather Spot	unknown	Fatality Search	7	Yes	X	X		
2017_382_ISEGS	YRWA	ACC	64	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_383_ISEGS	PISI	Power Block	73	Small	Small Carcass	singed	Fatality Search	6	No	X	X		Older than Search Interval
2017_384_ISEGS	UNID	Power Block	28	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_385_ISEGS	UNAC	Inner HD	219	Large	Feather Spot	unknown	Fatality Search	14	Yes	X		X	
2017_386_ISEGS	YRWA	Power Block	29	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_387_ISEGS	UNID	Power Block	28	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_388_ISEGS	YRWA	Power Block	23	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_389_ISEGS	UNID	Power Block	50	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_390_ISEGS	VGSW	Inner HD	202	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_391_ISEGS	VESP	Inner HD	110	Small	Feather Spot	unknown	Fatality Search	6	Yes	X		X	
2017_392_ISEGS	YWAR	Inner HD	111	Small	Feather Spot	singed	Fatality Search	6	No	X		X	Older than Search Interval

2017_393_ISEGS	WIWA	ACC	46	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_394_ISEGS	CHSP	ACC	46	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_395_ISEGS	UNFI	Inner HD	107	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_396_ISEGS	BHGR	Inner HD	162	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_397_ISEGS	WIWA	ACC	51	Small	Small Carcass	singed	Fatality Search	6	Yes	X	X		
2017_398_ISEGS	UNID	Inner HD	146	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_399_ISEGS	OCWA	Inner HD	150	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_400_ISEGS	NOMO	Inner HD	159	Small	Feather Spot	singed	Fatality Search	6	No	X		X	Older than Search Interval
2017_401_ISEGS	UNWO	Power Block	21	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_402_ISEGS	UNID	Inner HD	140	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_403_ISEGS	BTSP	Power Block	25	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_404_ISEGS	UNID	Inner HD	185	Small	Small Carcass	singed	Fatality Search	6	Yes	X		X	
2017_405_ISEGS	UNID	Power Block	32	Small	Feather Spot	unknown	Fatality Search	6	Yes	X	X		
2017_406_ISEGS	UNWO	Power Block	90	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_407_ISEGS	UNID	Power Block	116	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_408_ISEGS	FOSP	Power Block	93	Small	Feather Spot	unknown	Fatality Search	6	Yes	X	X		
2017_409_ISEGS	UNID	Inner HD	176	Small	Feather Spot	unknown	Fatality Search	6	Yes	X		X	
2017_410_ISEGS	YRWA	Power Block	73	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		

2017_411_ISEGS	SAVS	Inner HD	254	Small	Feather Spot	unknown	Fatality Search	6	Yes	X		X	
2017_412_ISEGS	UNSW	Inner HD	190	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_413_ISEGS	UNID	Power Block	25	Small	Feather Spot	singed	Fatality Search	6	Yes	X	X		
2017_414_ISEGS	UNID	Power Block	69	Small	Feather Spot	singed	Fatality Search	6	No	X	X		Older than Search Interval
2017_415_ISEGS	UNSP	Inner HD	207	Small	Feather Spot	unknown	Fatality Search	6	Yes	X		X	
2017_416_ISEGS	UNID	Inner HD	217	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_417_ISEGS	UNDU	Power Block	88	Large	Feather Spot	unknown	Fatality Search	6	Yes	X	X		
2017_418_ISEGS	HOFI	Power Block	12	Small	Small Carcass	singed	Incidental	1(1)	Yes	X	X		
2017_419_ISEGS	YRWA	Inner HD	150	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_420_ISEGS	UNID	Inner HD	162	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	
2017_421_ISEGS	UNID	Inner HD	162	Small	Feather Spot	singed	Fatality Search	6	Yes	X		X	