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2016 SUMMER REPORT

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VEST







Executive Summary

Avian and bat monitoring surveys were conducted from 25 May 2016 – 17 August 2016 (the summer 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 are investigated by surveying 100 percent of the tower area in all three units, and collisions with facility structures (towers and heliostats) are evaluated by systematic sampling of 100% of the tower areas (154 acres) in each of the three units, and 20% of Unit 2 heliostat field (240 acres) as representative of the facility. The "tower area" consists of the power block and inner high-density (HD) heliostats surrounding each power block on approximately 154 acres; and 2) the "heliostat area" consists of the inner and outer heliostat segments outside of the inner HD heliostats on approximately 2,991 acres. Searches were conducted within the summer season at intervals of approximately 21 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 25 May - 17 August 2016, 3 bat detections and 112 avian detections (including 2 injured birds) were found.

According to the specifications of the revised Plan, the number of avian detections was 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 facility.

Using the fatality estimator model, during the period 25 May – 17 August 2016, there were an estimated 262 fatalities (45.1%) from known causes and 319 fatalities (54.9%) from unknown causes. Of the known causes, 245 fatalities (93.5%) were estimated for the 154-acre tower area; an estimate is not provided for the 2,991 acre heliostat area as no known cause detections were found in the Unit 2 heliostat area. Of the unknown causes, 65 fatalities (20.4%) were estimated for the tower area, and 5 or fewer detections occurred in the heliostat area; thus, an estimate is not provided. Overall, based on the monitoring results and estimates for known causes for the 2016 summer season, the effect of the Project on birds is "low" as defined in the Plan.

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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 proponent in collaboration with the Technical Advisory Committee (TAC) made up of 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 TAC in November 2013 and required two years of monitoring, which were completed at the end of October 20, 2015. As determined by the TAC, 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 year of monitoring to provide collision and flux mortality estimates. Revision 13 of the Plan (2015) reflects reduced monitoring requirements as informed by the first two years of intensive monitoring. 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 generally less than 5 detections per season. Additionally, the patterns associated with avian use have been consistent over the seasons and documented in the annual reports. Therefore, as revised, this Plan has the following goals:

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

- 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.

The revised Plan (2015) continues to: 1) satisfy the BLM Right-of-Way (ROW) Permit requirement that the 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 (FESA), 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, FESA, and relevant state regulations (USFWS 2012).

1.3 Purpose of This Report

This report represents the third "quarterly" (i.e., seasonal) report for the third year of monitoring (or, the eleventh quarterly report) summarizing monitoring methods and results for avian and bat fatalities and injuries based on the procedures and requirements specified in the USFWS-accepted Plan and as required by CEC Condition of Certification BIO-21. This report covers the summer 2016 season, which includes the period from 25 May – 17 August 2016.



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 (see Plan (2015) for detailed methods), with greater detail provided when methods differ from original Plan (2013).

2.1 Facility Monitoring

This section describes areas surveyed, the timing and frequency 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" and a sample of the "heliostat area". 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. The heliostat area is defined as the inner and outer heliostat segments outside of the inner HD heliostats. For year 3, 100% of the tower area at each unit was surveyed and 20% of the Unit 2 heliostat area (8% of the total heliostat area) was surveyed. Table 1a provides the acreage searched within each of the survey areas, as well as the percent of the facility comprised by these search areas. Overall, approximately 12.9% of the Project was searched (Figure 2).

To ensure a balanced distribution of heliostat field survey plots, Unit 2 was divided into inner and outer heliostat fields, and approximately 20% of each sub-area was randomly selected for monitoring. Arc plots used for monitoring in Unit 2 were the same as previous years. This stratified random sampling design ensures that survey plots will not be clustered or biased in any distance or direction from the tower.

Area	Facility Locations Included	Acreage Searched	Percent of Facility
Tower Area	ACC, Power Block, Inner HD	wer Block, Inner HD 154	
	Unit 2 Inner and Outer		
Heliostat Area	Heliostat Segments	240	8.09%
Total		394	12.89%
A			

Table 1a. Monitoring Areas, 2016 Spring Season.

*NA = Not applicable as offsite survey areas are located outside of the facility

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Figure 2. Ivanpah Search Areas.

2.1.1.2 Search Frequency and Timing

Consistent with the first two years of monitoring, standardized searches occurred at each unit on a nominal 21-day interval through the 2016 summer 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 intervals between seasons of differing length. The tower areas of Units 1, 2 and 3 were visited a total of four times, and the inner and outer heliostat segments of Unit 2 were visited four times.

2.1.1.3 Search Methods

Biologists performed surveys in the tower area, and plots in the heliostat area. Standardized walking surveys for fatalities were performed by biologists approved by CEC and BLM, in accordance with the methods outlined in the Plan (2015). In the heliostat area, a pair of biologists walked a total of four transects oriented longitudinally along the complete length of each arc-plot, with the ring roads serving as the outer boundaries of each arc plot (Figure 3). While walking each transect, biologists walked a narrow search section approximately 10 meters (m) wide. 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.



Figure 3. Monitoring Search Pattern for Arc Plots.

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 were 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-m² 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 2016 summer monitoring season. A total of 21 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 summer monitoring season.

The facility contains vegetated and unvegetated areas that could affect the ability to detect a carcass or the amount of time a carcass persists until it is scavenged. The tower area (power block and inner high density (HD) heliostat area, where most singed detections occur, is unvegetated; all other areas are considered vegetated. In order to examine carcass persistence times for vegetated and unvegetated areas, carcasses were also distributed through the facility, with 10 carcasses placed in the unvegetated tower area, and 11 carcasses placed in the vegetated heliostat arrays. Non-native house sparrows (*Passer domesticus*) were used for small carcass trials conducted during the 2016 summer 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 63 searcher efficiency trials (21 small birds, 21 large birds, and 21 feather spots) were conducted during the 2016 summer monitoring season. Carcasses and feather spots were placed in various vegetation heights and in areas that had different soil and vegetation colors and values to represent the range of conditions under which searches occur. Trials were placed in the tower areas of all three units and in the heliostat area of Unit 2; however, no trials were placed in the ACC building since detection probability is assumed to be 100% in this area of the power block. Each trial carcass was placed by a designated biologist 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 determine 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.

Overall, 36 trial carcasses/feather spots were placed in the tower area and 35 trial carcasses were placed in vegetated areas in the inner/outer segments of the heliostat area. Of the 71 trial carcasses placed, 63 (21 small carcasses, 21 large carcasses, and 21 feather spots) were available to be found; 8 carcasses (4 small carcasses, 3 large carcasses, and 1 feather spot) were removed (scavenged) from the trial location before searchers had an opportunity to find them.

2.1.4 Incidental Reporting

Some detections were made 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 and 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 2.2.5, incidental data could be included in the fatality estimates when they were found in areas covered during standardized surveys (e.g., tower area or heliostat area of Unit 2). Incidental detections from outside the survey areas were not included in the fatality estimates as discussed in Section 2.2.5; 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 (e.g., vegetated

areas underneath heliostats versus cleared areas around towers). 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/*r*p,

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 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 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, as well as 90% confidence using bootstrapping (Manly 1997). Bootstrapping is a computer simulation technique that is useful for calculating point estimates, 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 the variation of r for the observed detection data.

Estimating Searcher Efficiency. Searcher efficiency, or the proportion of carcasses detected, p, is represented most simply by the following equation:

$p = \frac{Number \ of \ Carcass \ Observed}{Number \ of \ Carcasses \ available}$

Model Selection for Searcher Efficiency Trials. The Plan states that searcher efficiency trials will be conducted during each season in which vegetation differs from the prior season, because changes in vegetative cover may affect carcass detectability. *A priori* decisions were not made regarding whether vegetative cover would differ between seasons, but rather, searcher efficiency trials were conducted in all season. Following the completion of fall searcher efficiency trials, there was sufficient cumulative data for the year to assess whether searcher efficiency differed significantly by Project area (e.g., unvegetated tower area versus vegetated heliostat fields), season, and/or carcass size. The nearly complete lack of vegetation cover in the tower area suggested that searcher efficiency may be higher in the tower area than in other Project areas. If this hypothesis were true, accounting for this difference in searcher efficiency across Project areas would be important for producing accurate fatality estimates.

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 Project area was defined using two categories to reflect the suspected differences in searcher efficiency due to differences in vegetation cover: the tower area, which consists of the power block and the inner HD heliostats, and other areas, which consists of all other Project areas not included in the tower area. Models were constructed for all combinations of year, season, carcass size, Project area, and compared to the null model (Table 8). 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 2016 summer season.

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. A separate estimate was produced for the heliostat area of all three Units (the inner and outer heliostat segments combined), in which 8% of the total area was searched. Fatality estimates reported in the inner/outer heliostat areas were adjusted to account for the unsearched area in the inner/outer heliostat areas (i.e., divided by 0.08).

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 tower area. All detections within the ACC buildings are considered facility related, whether or not

they showed evidence of singeing or collision; if there was no evidence of singeing or collision on a detection found in the ACC, the cause was assumed to be entrapment in some portion of the ACC unit.

Within the power block, during the 2016 summer season, incidental detections accounted for 42.0% 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 (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. In the 2015 fall season, 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).

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

Table 1b. Treatment of Incidental Detections by Location

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, 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 (Huso et. al 2016). Each detection made during the 2016 summer 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 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 biologist 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. The list of deterrence measures has been updated, and progress reports towards deterrence implementation have been provided to the TAC on a periodic basis.

Several deterrence measures have been implemented at Unit 1 for birds at Ivanpah. Specifically, new ground-level LED lighting and spikes were installed 5 February 2015. As approved by the TAC, a chemosensory deterrence measure commercially known as BirdBuffer, was deployed on 12 October 2014, 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.

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 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 initiated to ensure proper function of all deterrence units.

Section 3.0 Monitoring Results

3.1 Summary of Avian Detections

The average search interval was 20.4 days (range 5 to 34, median 22 days) during the 2016 summer 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 switching seasons, and several holidays during the summer season.

During the 2016 summer season, a total of 112 avian detections (including injured birds and incidentals) of 27 identified species (Table 2) were recorded. Approximately 65% of detections were songbirds, with 27% being other types of bird; 8% could not be identified to at least a species group. The most numerous detection of an identified species was tree swallow followed by cliff swallow and northern rough-winged swallow. Most detections occurred in the tower area (Figures 4, 5, 6, and 7), where approximately 154 acres were surveyed, representing 100% of the total tower area.

Species	Scientific Name	Injuries	Fatalities	Songbird?
tree swallow	Tachycineta bicolor	1	14	Yes
cliff swallow	Petrochelidon pyrrhonota	0	11	Yes
northern rough-winged swallow	Stelgidopteryx serripennis	0	10	Yes
yellow warbler	Setophaga petechia	1	8	Yes
unidentified bird (small)		0	8	Unk
unidentified swallow		0	7	Yes
unidentified hummingbird		0	7	No
black-throated sparrow	Amphispiza bilineata	0	4	Yes
costa's hummingbird	Calypte costae	0	4	No
lesser nighthawk	Chordeiles acutipennis	0	3	No
verdin	Auriparus flaviceps	0	2	Yes
macgillivray's warbler	Geothlypis tolmiei	0	2	Yes
northern mockingbird	Mimus polyglottos	0	2	Yes
lucy's warbler	Oreothlypis luciae	0	2	Yes
black-tailed gnatcatcher	Polioptila melanura	0	2	Yes
killdeer	Charadrius vociferous	0	2	No
rufous hummingbird	Selasphorus rufus	0	2	No
greater roadrunner	Geococcyx californianus	0	1	No
mourning dove	Zenaida macroura	0	1	No
unidentified grebe		0	1	No
house finch	Haemorhous mexicanus	0	1	Yes
bullock's oriole	Icterus bullockii	0	1	Yes
loggerhead shrike	Lanius ludovicianus	0	1	Yes
brown-headed cowbird	Molothrus ater	0	1	Yes

Table 2.	Number	of Individual	Bird De	etections,	by Species,	2016 Summ	1er Season

Species	Scientific Name	Injuries	Fatalities	Songbird?
orange-crowned warbler	Oreothlypis celata	0	1	Yes
lazuli bunting	Passerina amoena	0	1	Yes
bank swallow	Riparia riparia	0	1	Yes
violet-green swallow	Tachycineta thalassina	0	1	Yes
western kingbird	Tyrannus verticalis	0	1	Yes
unidentified flycatcher		0	1	Yes
unidentified oriole		0	1	Yes
unidentified sparrow		0	1	Yes
unidentified warbler		0	1	Yes
long-billed curlew	Numenius americanus	0	1	No
white-throated swift	Aeronautes saxatalis	0	1	No
unidentified bird (unknown size)		0	1	Unk
unidentified large bird		0	1	Unk
Total		2	110	NA

*NA – Not Applicable



Figure 4. Ivanpah 1 Detections.



Figure 5. Ivanpah 2 Detections.



Figure 6. Ivanpah 3 Detections.

3.1.1 Temporal Patterns of Avian Detections

The number of detections reported per day was low throughout the 25 May 2016 - 17 August 2016 summer season (Figure 7). Unplanned forced outages occurred during a portion of the summer monitoring season. Unit 2 was offline from 6 April – 19 June, and Unit 3 was offline from 19 May – 24 June 2016. The patterns in the number of singed detections per day were likely influenced by the unplanned forced outages as only Unit 1 was fully operation though June. The number of detections per day represents the accumulation of detections over the search interval minus those detected incidentally and removed between searches. Peaks in the number of singed detections and overall detections per day relate to the day a tower area was searched.



Number of Detections Found during Carcass Searches in the Tower Area by Date at Units 1, 2, and 3

Number of Detections Found during Carcass Searches in the Heliostat Arrays by Date at Unit 2



Figure 7. Number of Detections on Each Survey Date, 25 May – 17 August.

Two injured birds were detected during the 2016 summer season (Table 3); both succumbed to their injuries.

				Cause of	Flux	
Date	Species	Age	Sex	Injury	Grade	Status
7/22/2016	Tree swallow	Adult	Male	Singed	2;3	Died at rehab
8/9/2016	Yellow warbler	Juvenile	Male	Singed	1	Died on-site

Table 3. Avian Injuries Detected 25 May – 17 August 2016.

3.1.3 Summary of Bat Detections

Three bats representing two species and one unidentified species were detected during the 2016 summer season. A Mexican free-tailed bat and canyon bat were located in the Unit 1 ACC building and the Unit 3 power block, respectively; an unidentified bat was located in the Unit 3 power block. 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 summer 2016, of the 112 total detections, 108 detections (96.4%) were recorded at the tower area and 4 detections (3.6%) were recorded over the heliostat area (Table 4). Of the 112 avian detections, 44 (39%) were detected in Unit 1, 21 (19%) in Unit 2, and 47 (42%) in Unit 3.

Table 4. Locations of Avian Detections, 25 May – 17 August 2016.

Location	Carcasses	Injuries	Percent of Total
Tower Area	106	2	96.4%
Heliostat Array	4	0	3.6%
Total	110	2	100.0%

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 8 shows the distribution of detections by cause. Percent composition results should not be compared between years because of changes to the study design between the Plan Revision 13 (2012-2014) and Revision 14 (2015-2016).

3.3.1 Singeing Effects

Of the 112 avian detections during the 2016 summer season, 85 detections (75.9%) showed signs of singed feather damage, and 85 (100%) of singed detections were recorded in the tower area (Table 5).

3.3.2 Collisions

Of the 112 avian detections, evidence of collision was observed in the case of 2 (17.4%). Two detections (1.8%) with evidence of collision with heliostats were located in the tower area and 0 detections (0%) were located in the heliostat area. As described in Section 2.2.1.3, 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).

3.3.2 Other Cause

Of the 112 avian detections, four (3.6%) 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.



Figure 8. Locations of Singed and Unsinged Detections within Solar Units.

3.3.4 Detections of Unknown Cause

Of the 112 avian detections, evidence of singeing, collision, or other cause could not be assigned for 21 detections (18.8%; Table 5). 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. Of the unknown cause detections, 4 (19%) were recorded in the heliostat area, and 17 (81%) were recorded in the tower area.

Table 5.	Locations	of Bird	Detections,	25 May -	17	August 2016.
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Location	Singeing	Collision	Other	Unknown	Total
Tower Area	85	2	4*	17	108
Heliostat Area	0	0	0	4	4
Total	85	2	4	21	112

*These carcasses were found in the ACC unit with no sign of collision or singe and are attributed to entrapment.

3.4 Types of Detections

Thirty (26.8%) of the 112 detections consisted only of feather spots (Table 6a). Feather spots accounted for 50% of detections in the heliostats area, and approximately 26% of detections in the tower area. Evidence of singeing was noted through direct and microscopic examination on 14 of these 30 feather spots; evidence of collision (i.e., an impact imprint on a nearby mirror) was noted in the case of two feather spots. Otherwise, the causes of the feather spots for the other 16 detections are unknown (Table 6b).

Location	Carcasses	Feather Spot	Total	Percent Feather Spot
Tower Area	80	28	108	25.9%
Heliostat Area	2	2	4	50%
Total	82	30	112	26.8%

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

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

Cause	Carcasses	Feather Spots	Total	Percent Feather Spot
Singed	71	14	85	16.5%
Collision	1	1	2	50%
Other	3*	1	4	25%
Unknown	7	14	21	66.7%
Total	82	30	112	26.8%

*These carcasses were found in the ACC unit with no sign of collision or singe and are attributed to entrapment.

Section 4.0 Fatality Estimation

This section utilizes the detection data as described in Section 3 to develop an overall fatality estimate in accordance with the Plan (2015). The total estimate for the entire facility is presented separately for fatalities with evidence of singeing or collision effects, or for detections in the ACC buildings, and fatalities of unknown cause. Following presentation of the total fatality estimates, estimates are provided separately for the tower area, and heliostat area.

4.1 Estimating Model Parameters

4.1.1 Carcass persistence Trials

A total of 20 small bird carcass persistence trials were conducted during the 2016 summer monitoring season. Trials were distributed throughout the facility. Consistent with previous seasons, scavengers included common raven (*Corvus corax*, N=8), desert kit fox (*Vulpes macrotis*; N=8), and white-tailed antelope squirrel (*Ammospermophilus leucurus*; N=2). In four instances the scavenger could not be identified. Small bird carcass persistence ranged from less than one day in the case of 8 carcass to over 42 days; one carcass lasted the full six-week trial period (Figure 9). 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 10).

In addition to the 2016 summer trials described above, carcass persistence trials from the first two years of monitoring, and prior seasons (winter and spring) of year 3 were also used in the model. Carcass persistence data from 21 small bird trials conducted during the 2016 spring season, 30 small bird trials conducted during the 2015-2016 winter season, 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 2013-2104 monitoring year were used to model carcass persistence time. Details on carcass persistence times can be found in each respective seasonal report.



Persistence Duration of Small Carcasses Summer 2016 (N = 21)

Figure 9. Persistence Durations for Small Carcasses Placed for 2016 Summer Carcass Persistence Trials (N = 21).



Figure 10. Persistence Durations for Large Carcasses Placed for All Carcass Persistence Trials.

4.1.2 Model Selection for Carcass Persistence Distribution

Consistent with the second year of monitoring and 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, 16 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 potential covariate to assess whether respective seasons could be pooled across years (i.e. does persistence time vary by season *and* year, just year, just season, or neither). Finally, location (unvegetated tower area or the

vegetated heliostat area) was considered a potential covariate to understand if carcass persistence in the tower area and heliostat area was different.

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 the loglogistic and lognormal models that included season had Δ AICc values ≤ 2 ; for large birds, the exponential, Weibull, loglogistic, and lognormal models with intercept only had Δ AICc values ≤ 2 (Tables 7a and 7b). Ultimately, a loglogistic model with 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 treat as separate the persistence probability for each season, with seasons pooled across years. For large birds, the top model does not have any temporal covariates, and thus uses all large bird data collected to date to estimate persistence probability. The chosen models predicted 96.5% of large carcasses persisted for the nominal search interval of during the 2016 summer monitoring season.

Small Bird Trials										
Covariates	Distribution	AICc	Δ AICc							
Season	loglogistic	1162.09	0							
Season	lognormal	1164.02	1.93							
Season + Project Area	loglogistic	1164.20	2.11							
Year + Season	loglogistic	1164.21	2.12							
Year + Season	lognormal	1165.95	3.86							
Season + Project Area	lognormal	1166.13	4.04							
Season + Year + Project Area	loglogistic	1166.24	4.15							
Season + Year + Project Area	lognormal	1167.94	5.85							
Season + Year + Project Area	Weibull	1168.35	6.26							
Year + Season	Weibull	1169.79	7.70							

Table 7a. AICc Values for the Top 10 Small Bird Carcass Persistence Mode
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Large Bird Trials										
Covariates	Distribution	AICc	Δ AICc							
Intercept	Exponential	97.00	0							
Intercept	Weibull	97.96	0.96							
Intercept	Loglogistic	98.03	1.03							
Intercept	Lognormal	98.15	1.15							
Season	Exponential	98.34	1.34							
Season	Weibull	99.62	2.62							
Year + Season	Exponential	99.64	2.64							
Season	Loglogistic	99.75	2.75							
Season	Lognormal	99.87	2.87							
Year + Season	Lognormal	100.68	3.68							
Year + Season	Loglogistic	100.98	3.98							
Year + Season	Weibull	101.08	4.08							
Year + Season + Year*Season	Exponential	107.36	10.36							
Year + Season + Year*Season	Lognormal	108.69	11.69							
Year + Season + Year*Season	Loglogistic	109.00	12.00							
Year + Season + Year*Season	Weibull	109.09	12.09							

Table 7b. AICc Values for All Large Bird Carcass Persistence Models

4.1.3 Searcher Efficiency Trials

During the 2016 summer season, a total of 71 searcher efficiency trials (25 small birds, 24 large birds, and 22 feather spots) were placed. Trials were placed in locations with various vegetation heights and with a range of contrast between the soil and vegetation to represent the various conditions under which searches occur. Carcasses were placed in most areas where searches occurred (tower area and heliostat area). Four small bird trials, 3 large bird trials, and 1 feather spot trial, were removed (scavenged) prior to a searcher having the opportunity to detect the carcass.

A total of 69 searcher efficiency trials (26 small birds, 21 large birds, and 21 feather spots from the spring 2016 season and 83 searcher efficiency trials (33 small birds, 24 large birds, 26 feather spots) from the 2015-2016 winter monitoring seasons were included in the dataset used to fit a searcher efficiency model for the 2016 summer season. An additional 320 human searcher efficiency trials (129 small birds, 96 large birds, and 95 feather spots) from the 2014 - 2015 monitoring year used to fit a searcher efficiency model for the 2016 summer season. Of the 320 trial carcasses placed, 268 (129 small birds, 96 large birds, and 95 feather spots) were available to be found; 52 carcasses (42 small birds, 8 large birds, and 2 feather spots) were removed from the trial location before searchers had an opportunity to detect the carcass. Finally, 154 searcher efficiency trials (52 small birds, 44 large birds, 57 feather spots) from the first year of study were also included in searcher efficiency model building. Of 154 trials from the first year of monitoring, 144 (48 small birds, 39 large birds, and 57 feather spots) were not removed and thus

available to be found by a searcher. Details about searcher efficiency trials performed prior to the 2016 summer season can be found in the respective quarterly reports.

Searcher efficiency rates were generally higher in the unvegetated areas in the tower area. During the 2016 summer season, in unvegetated areas, human searcher efficiency was 78% for small birds, 90% for large birds, and 80% for feather spots. In the vegetated areas in the heliostat arrays, searcher efficiency was 48% for small birds, 71% for large birds, and 52% for feather spots.

Covariates	AICc	Δ AICc
Size + Project Area + Year	734.06	0.00
Size + Project Area + Season + Year	734.72	0.66
Size*Project Area + Year	735.26	1.20
Size + Size*Project Area + Year	735.26	1.20
Project Area + Size*Project Area + Year	735.26	1.20
Size + Project Area + Size*Project Area + Year	735.26	1.20
Season + Size*Project Area + Year	735.80	1.74
Size + Season + Size*Project Area + Year	735.80	1.74
Project Area + Season + Size*Project Area + Year	735.80	1.74
Size + Project Area + Season + Size*Project Area + Year	735.80	1.74

Table	8 .	Cov	ariates	, AICc	Value	es, and	I ∆AICc	value	es for	the	top	ten	searcher	efficie	ency
	mo	dels.	Data	consist	t of all	humo	ın searc	her e	fficier	ncy f	trials	for	carcasses	s from	the
	init	iatior	n of tria	Is throu	Jgh Mo	arch 2	5, 2016.								

The best model for searcher efficiency included carcass size, project area, and year with an AICc value 0.66 points lower than the second best model that included size, project area, season, and year (Table 8). Thus, the most supported searcher efficiency model produces searcher efficiency estimates based on carcass size, project area (unvegetated tower area and vegetated heliostat area), and year. 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.

Table 9. Human Searcher Efficiency Sample Sizes Used for Modeling, and Model Predictions for Size and Project Area Categories Winter Year 1 – Summer Year 3.

Size	Location	Found	Available	Placed	Predicted Searcher Efficiency (90% CI)
Feather spot	Tower area (Unvegetated)	75	106	110	0.80 (0.74-0.86)
Large bird	Tower area (Unvegetated)	82	95	103	0.90 (0.86-0.94)
Small bird	Tower area (Unvegetated)	78	103	137	0.78 (0.71-0.84)
Feather spot	Heliostat area (Vegetated)	51	110	112	0.52 (0.44-0.61)
Large bird	Heliostat area (Vegetated)	62	96	105	0.71 (0.64-0.79)
Small bird	Heliostat area (Vegetated)	36	100	129	0.48 (0.40-0.57)

4.2 Fatality Estimates of Known Causes for 2016 Summer Monitoring

Fatality estimates were calculated separately for the tower area (power block and inner HD heliostats) and heliostat area. Note that estimates are not provided for factor combinations with five or fewer detections; thus, marginal totals (e.g. total singed, total known cause in the heliostat area, etc.) for the tables below may not reflect the sum of estimates within a given row or column (and are generally higher).

4.3.1 Total Fatality Estimates for Known Causes

There were 91 bird detections where the cause of death or injury could be determined and were facility related, of which 67 were included in the fatality estimate model (Tables 10a and 10b); of these 67 detections, 20 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 24 detections showing evidence of singeing or collision outside the ACC buildings that were not included in the fatality estimates; two were excluded because they were outside the standardized survey areas and 22 were excluded because they were determined to be older than the search interval.

Table	10a.	Number	of I	Bird	Detections	Based	on	Known	Causes	in	Each	Project	Element
I	ncluc	ded or Exe	clud	led f	rom Fatality	[,] Estima	ites,	by Cau	use.				

		Include	d		_		
Location	Collision	Singed	Other	Collision	Singed	Other	Total
Tower Area	2	61	4*	0	24	0	91
Total	2	61	4	0	24	0	91

*These carcasses were found in the ACC unit with no sign of collision or singe and are attributed to entrapment.

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

		Included					
Location	Large Birds	Small Birds	Raptors*	Large Birds	Small Birds	Raptors*	Total
Tower Area	1	66	0	1	23	0	91
Total	1	66	0	1	23	0	91

* 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. 2016 Summer Season Avian Fatality Estimates by Cause and Project Element (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	N ≤ 5	245 (203-309)	4	262 (217-330)
Heliostat Area	0	0	0	0
Total	N ≤ 5	245 (203-309)	4	262 (217-330)

*These carcasses were found in the ACC unit with no sign of collision or singe and are attributed to entrapment.

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

Table 12. 2016 Spring Season Avian Fatality Estimates by Carcass Size and Project Element (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	258 (216-329)	0	262 (217-330)
Heliostat Area	0	0	0	0
Total	N ≤ 5	258 (216-329)	0	262 (217-330)

* $N \leq 5$ indicates 5 or fewer detections and no fatality estimate is provided

4.3.2 Fatality Estimate for Tower Area and Heliostat Area

Tables 11 and 12 present the fatality estimates for known causes within the tower area, broken down by cause or carcass size, respectively. 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 25 May 2016 – 17 August 2016 (85 days of monitoring), there were an estimated 262 fatalities (90% confidence interval 217-330) based on detections from known causes (i.e., singeing, collision; Table 11). All fatalities of known cause occurred in the tower area. There were 258 estimated small bird fatalities (90% confidence interval 216-329; Table 12).

4.4 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 5.2 for detections with direct evidence of the cause of the fatality (i.e., singeing, collision, or other).

There were 21 detections where the cause of death could not be determined, of which 29 were included in the fatality estimator (Tables 13a and 13b). Of the 5 detections of unknown cause excluded from the fatality estimator, all detections were determined to be older than the search interval.

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

Location	Included	Excluded	Total
Tower Area	12	5	17
Heliostat Area	4	0	4
Total	16	5	21

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

		Included					
	Large	Small		Large	Small		
Location	Birds	Birds	Raptors*	Birds	Birds	Raptors*	Total
Tower Area	4	8	0	0	5	0	17
Heliostat Area	2	2	0	0	0	0	4
Total	6	10	0	0	5	0	21

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

4.4.1 Total Fatality Estimates from Unknown Causes

During the period of 25 May 2016 - 17 August 2016, the total estimate of fatalities from unknown cause was 319 (90% confidence interval 110-651; Table 14). A total of 71 (90% confidence interval 57-92) were in the tower area. There were only 4 detections of unknown cause in the heliostat area, therefore no estimate is presented; however, the contribution of fatalities is included in the overall unknown cause estimate since there were greater than 5 detections of unknown cause, overall. Of the estimated unknown cause fatalities, small birds accounted for 85% of the estimated fatalities (Table 15).

Table 14. Site-Wide Fatality Estimates from Unknown Causes by Location, 25 May – 17 August.

Project Area	Estimate (90% CI)
Tower Area	71 (57-92)
Heliostat Area	N ≤ 5
Total	319 (110-651)

Location	Large Birds	Small Birds	Raptors	Total
Tower Area	N ≤ 5	65 (52-87)	0	71 (57-92)
Heliostat Area	N ≤ 5	N ≤ 5	0	N ≤ 5
Total	49 (5-108)	270 (66-597)	0	319 (110-651)

Table 15. Site-Wide Fatality Estimates from Unknown Causes by Size and Location, 25 May – 17 August 2016.

* \overline{N} \leq 5 indicates 5 or fewer detections and no fatality estimate is provided

4.6 Regional Awareness Monitoring

During the 2016 Summer season, no injured birds were taken to rehab. Neither the facility nor its designated biologist were contacted by any veterinarian or rehab center about singed birds brought in by non-project staff. In addition, Dr. Craig Himmelwright, who performs periodic raven surveys across the Ivanpah Valley has not reported signed detections occurring outside of the Project.

Section 5.0 Discussion

The 2016 summer season represented the continuation of standardized monitoring of avian and bat detections and avian use 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 low throughout the 2016 summer season. A tower area search during the 2016 summer season is a look back over approximately 21 days, so it would be expected that the tower searches would reflect the accumulation of carcasses over that time span. The patterns in the number of singed detections per day were likely influenced by the unplanned forced outages at Units 2 and 3 until the end of June; from June 24 to the end of the summer period all units were operational.

5.2 Spatial Patterns in Detections and Fatality Estimates

The distribution of known cause detections varied by facility area. No known cause detections were found in the Unit 2 heliostat area. Thus, all known cause detections were found in the tower area.

Unknown cause detections accounted for approximately 18.8% of all detections during the 2016 summer season. Of the unknown cause detections, 66.7% were feather spots or partial carcasses that showed signs of scavenging. Determining a cause of mortality from a feather spot or partial carcass is challenging because sources of mortality such as collision or predation would rarely leave visible evidence on the feathers as would flux effects. Thus, feather spots with an unknown cause of mortality could be encountered anywhere birds occur, and an unknown cause of mortality is not unique to the Project. Further, the large proportion of feather spots among the detections for the Project as a whole may inflate the fatality estimate when unknown cause detections are included based on the potential for multiple feather spots resulting from one fatality, feather spots resulting from predation not associated with the facility, or other causes.

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 2016 summer season fatality data owing to the low numbers of detections within "a particular species or group of species"; however, the results indicate that the potential migratory bird mortality by species or groups of species from this project would be categorized as low. A more complete analysis will be conducted for the annual report. Approximately 65% of the detections 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.

None of the nine species represented by more than three detections is particularly rare locally, regionally, or nationally. Rather, all nine species are relatively abundant and widespread. Thus, the magnitude of detections of these species at Ivanpah during the 2016 fall season does not rise above the "low" category. Special-status species recorded as detections were nine yellow warbler (California species of special concern) and one crissal thrasher (California species of special concern).

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 and thus, there is no local population for evaluation. An estimated 600,000 yellow warblers occur regionally within California and an estimated 34,000,000 occur nationally in the United States (Partners in Flight Science Committee 2013). The nine yellow warblers detected represented a very small proportion of these populations; thus, the estimated yellow warbler fatalities during the 2016 summer 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).

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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
	Northern Rough-							Broken up. Partial right wing with connective tissue at the base. No evidence of					639651,	
2016 189 ISEGS	winged Swallow	NRWS	Carcass Survey	5/26/2016	5/26/2016	Broken up	3-6 days	singe.	Unknown	NA	2	Heliostat	3936194	NA
 	Unknown Small Bird	UNID	Carcass Survey	5/31/2016	5/31/2016	Mummified	2 weeks	Mummified broken up carcass consisting of whole bird minus head. Evidence of singe to entire body with wings and tail singed off.	Scorched or singed	3-Feb	3	ACC Building	637454, 3937968	NA
2016 191 ISEGS	Unknown Warbler	UNWA	Carcass Survey	5/31/2016	5/31/2016	Broken up	2 weeks	Exposed skeleton including rib cage, skull, neck and legs with most of flight feathers attached to wings, 2 secondaries, 5 loose primaries, and 84 body feathers. Evidence of curling to primaries and secondaries in both wings.	Scorched or singed	2	3	Powerblock	637442, 3937928	NA
 2016 192 ISEGS	Cliff Swallow	CLSW	Carcass Survey	5/31/2016	5/31/2016	Dead, Semi- fresh (eyes desiccated, rigor mortis)	3-6 days	Whole carcass, missing leg. Evidence of curling and singeing to all flight feathers.	Scorched or singed	3-Feb	1	ACC Building	640396, 3933533	NA
2016 103 ISEGS	Orange-crowned	00040		5/31/2016	5/31/2016	Dead, fresh	8-24 hours	Whole carcass. Evidence of curling on flight feathers in both wings and in retrices, singeing on head, nape, back and right flank	Scorched or	3-Eeb	1	Bowerblack	640431,	NA
2016_193_ISEGS	MacGillivray's Warbler	MGWA	Carcass Survey	6/2/2016	6/2/2016	Dead, Semi- fresh (eyes desiccated, rigor mortis)	2 days	Whole carcass. Evidence of probable collision with placement of fresh carcass in proximity of heliostat.	Collision with solar panel/heliostat	Unk	2	Heliostat	638564, 3936002	NA
2016_195_ISEGS	Unknown Grebe	UNGR	Carcass Survey	6/6/2016	6/6/2016	Feather spot	3-6 days	Feather spot size large, consisting of 3 secondaries, 50+ body feathers. No evidence of collision or singe.	Unknown	NA	1	Heliostat	640587, 3933395	NA
2016_196_ISEGS	Unknown Large Bird	UNLB	Carcass Survey	6/8/2016	6/8/2016	Broken up	2 weeks	Broken up carcass consisting (originally) of a pellet comprised of 200 contour feathers and 5 pieces of bone. No evidence of singe or collision.	Unknown	Unk	2	ACC Building	638667, 3935895	NA
2016_197_ISEGS	Greater Roadrunner	GRRO	Carcass Survey	6/24/2016	6/24/2016	Broken up	2 weeks	Broken up carcass consisting of a partial left wing with dried flesh and 5 clumps of body feathers comprising of 120 feathers. No evidence of collision or singe.	Unknown	Unk	2	Heliostat	638962, 3936223	NA
2016 198 ISEGS	Cliff Swallow	CLSW	Incidental	6/24/2016	6/24/2016	Dead, fresh (eyes moist)	0-8 hours	Whole carcass. Evidence of curling to all major flight feathers, singeing present	Scorched or singed	3-Feb	3	Powerblock	637459, 3937894	NA

								on head, back, and rump.						
								Whole Carcass. All flight						
								feathers curled or singed						
2016 100 105 00	Unknown							off. Singe present on over	Scorched or	251			640411,	
2016_199_ISEGS	Hummingbird	UNHU	Carcass Survey	6/26/2016	6/26/2016	Mummified	2 weeks	90% of carcass	singed	3-Feb	1	ACC Building	3933521	NA
								Broken up (detached						
								head). Primaries,						
								Secondaries and retricies						
	Black-Throated							curled. Singe present on	Scorched or				640360,	
2016_200_ISEGS	Sparrow	BTSP	Carcass Survey	6/26/2016	6/26/2016	Broken up	2 weeks	head and neck.	singed	3-Feb	1	ACC Building	3933536	NA
								Featherspot size large						
								comprised of 50+						
								crown/body feathers. All						
								feather stuck to mirror with	Collision with					
	Unknown Small							visible imprint indicating a	solar				640296,	
2016_201_ISEGS	Bird	UNID	Carcass Survey	6/27/2016	6/27/2016	Feather spot	0-8 hours	collision.	panel/heliostat	NA	1	Heliostat	3933673	NA
								Whole carcass with all tail						
	Black-tailed							feathers showing signs of	Scorched or				637449,	
2016_202_ISEGS	Gnatcatcher	BTGN	Carcass Survey	7/7/2016	7/7/2016	Mummified	2 weeks	singe.	singed	1	3	ACC Building	3937956	NA
						Dead, Semi-		Whole carcass. Primaries,						
						fresh (eves		secondaries, retrices						
						desiccated.		curled. Most of upperparts	Scorched or				637454.	
2016 203 ISEGS	Verdin	VERD	Carcass Survey	7/7/2016	7/7/2016	rigor mortis)	3-6 days	singed.	singed	3-Feb	3	Powerblock	3937933	NA
				.,.,====	.,.,====			Eeatherspot size small			-			
								comprised of 3 primaries						
								and 10+ body feathers 1						
								primary curled 2 singed						
	Unknown							and soveral singed body	Scorchod or				627/27	
2016 204 15505	Swallow		Caraasa Survey	7/7/2016	7/7/2016	Faathar coat	2 C davis	foothers	Scorched of	باهلا	2	Doworklock	2027020	NIA
2010_204_13EG3	Swallow	010300	Carcass Survey	////2010	////2010	reather spot	5-0 uays	Iedulers.	singeu	Ulik	5	POWEIDIOCK	5957920	NA
								whole Carcass, four						
								primaries curied the						
								majority of all other flight						
								feathers singed. Singe also						
								present on both sides of	Scorched or				637422,	
2016_205_ISEGS	Tree Swallow	TRES	Carcass Survey	7/7/2016	7/7/2016	Mummified	2 weeks	face.	singed	3-Feb	3	Powerblock	3937916	NA
								Whole Carcass, Tail						
								feathers partially curled.						
	Costa's					Dead, fresh		Singe present on nape,	Scorched or				637475,	
2016_206_ISEGS	Hummingbird	COHU	Carcass Survey	7/7/2016	7/7/2016	(eyes moist)	0-8 hours	back and rump.	singed	3-Jan	3	Powerblock	3937944	NA
													607400	
2016 207 105 00	Losta's	CO1111	Corrector Courses	7/7/2040	7/7/2040	N A	2	whole carcass, Retricies	Scorched or	4	2	Dowerhi I:	637403,	NLA
2016_207_ISEGS	Hummingbird	COHU	Carcass Survey	////2016	////2016	iviummified	2 weeks	and throat singed.	singed	1	3	Powerblock	3937969	NA
								Broken up carcass						
								consisting of partial right						
								wing, 9 primaries, 6						
								secondaries, and 35						
								contour feathers. No						
	Long-billed			, .	, .			evidence of collision or					638122,	
2016_208_ISEGS	Curlew	LBCU	Carcass Survey	7/11/2016	7/11/2016	Broken up	3-6 days	singe.	Unknown	NA	2	Heliostat	3935403	NA
								Whole carcass. Evidence of						
								curling to all flight feathers,						
								with the majority of the						
	Black-Throated							upperparts of breast	Scorched or				638656,	
2016_209_ISEGS	Sparrow	BTSP	Incidental	7/12/2016	7/12/2016	Mummified	3-6 days	singed.	singed	3-Feb	3	Powerblock	3935877	NA
	Black-tailed					Dead, fresh		Whole carcass. Evidence of	Scorched or				640378,	
2016_210_ISEGS	Gnatcatcher	BTGN	Incidental	7/12/2016	7/12/2016	(eyes moist)	0-8 hours	curling to flight feathers on	singed	3-Feb	1	Powerblock	3933479	NA

								left wing and in tail,						
								singeing to head, neck,						
								chest, and belly.						
								Whole carcass. Evidence of						
								singe on rump, flanks, and						
								entire ventral portion of						
	Unknown					Dead, fresh		body, with majority of	Scorched or				640384,	
2016_211_ISEGS	Hummingbird	UNHU	Incidental	7/12/2016	7/12/2016	(eyes moist)	8-24 hours	flight feathers singed off.	singed	3-Feb	1	Powerblock	3933469	NA
2046 242 16506	Rutous	5		- 40 /004 6	7/10/2016	Dead, fresh	0.041	Whole carcass. Evidence of	Scorched or	2			640388,	
2016_212_ISEGS	Hummingbird	KUHU	Incidental	//12/2016	//12/2016	(eyes moist)	8-24 hours	singe on several retrices.	singed	2	1	Powerblock	3933469	NA
								whole carcass. Evidence of						
						Deed Comi		curling to all flight feathers,						
						Dead, Semi-		singeing to majority of						
	L la lua avvua					fresh (eyes		upperparts, right side of	Coordoodor				C10210	
	Unknown		la cido atol	7/12/2010	7/12/2010	desiccated,		nead and right side of	Scorched or	2 Fab	1	Devuerbleelu	640348,	NIA
2016_213_ISEGS	Hummingbird	UNHU	Incidental	//12/2016	//12/2016	rigor mortis)	3-6 days	body.	singed	3-Feb	1	Powerblock	3933465	NA
						Deed Comi		Whole carcass with singe						
						Dead, Semi-		on primaries, secondaries,						
						fresh (eyes		and retrices curied/singed	Coordoodore				c20000	
2016 214 16566	Luciale Materiale in	11114/4	CC	7/12/2016	7/12/2016	desiccated,		off. Part of cap, back, rump	Scorched or	2.5.4	2		638669,	N 10
2016_214_ISEGS	Lucy's warbier	LUWA	Carcass Survey	//13/2016	//13/2016	rigor mortis)	3-6 days	singed.	singed	3-Feb	2	ACC Building	3935881	NA
								Feather spot size large,						
								consisting of 14						
								secondaries, 14 primaries,						
								and 75 body featners.						
	University Consell							Evidence of singe on the	Constant				620670	
2016 245 16566	Unknown Small		CC	7/12/2016	7/12/2016	E a sthan an at	2	tips of primaries and	Scorched or	111.	2	Deveryhole als	638679,	
2016_215_ISEGS	Bird	UNID	Carcass Survey	//13/2016	//13/2016	Feather spot	2 weeks	secondaries.	singed	Unk	2	Powerblock	3935877	NA
								Feather spot size = large.						
								with intact fiesh. 8						
								primaries, 4 secondaries, 1						
								retrix, 8+ contour, 4 wing	Constant				620650	
	white-throated		Company Company	7/12/2010	7/12/2010	Duelien un		coverts. Singe on majority	Scorched or	Link	2	Devuerbleelu	638658,	NIA
2010_210_13EG3	SWIIL	VV I SVV	Carcass Survey	//13/2010	//13/2016	втокен ир	3-0 údys	Of conected reathers.	singed	UNK	2	POWEIDIOCK	3933845	NA
								Feather spot size = large. 3						
	Lossor							primaries, 3 retrices, 2					628460	
2016 217 15565	Lesser		Carcass Survey	7/12/2016	7/12/2016	Easthar spat	2 wooks	bedy feathers. No singe	Unknown	Unk	2	Holiostat	038409,	NA
2010_217_13EG3	Nighthawk	LEINI	Carcass Survey	//15/2010	//15/2010	reather spot	2 weeks	Mula carease with singe	UTIKITUWIT	UIIK	2	Heliostat	3933900	INA
	Dufous					Dood frach		whole calcass with singe	Coorchod or				629575	
2016 219 15505	Rutous		Corross Survey	7/12/2016	7/12/2016	Dead, fresh	0.8 hours	on right side of face, partial	Scorched or	2 100	2	Doworkloak	038575,	NIA
2010_218_ISEGS	Hummingbird	KUHU	Carcass Survey	//13/2010	//13/2010	(eyes moist)	0-8 hours	Tetrices (singed, not curred)	singeo	2-J9U	2	POWEIDIOCK	3933838	NA
								whole carcass. Evidence of						
								curling to primaries,						
								secondaries, retrices, and						
						Deed freeh		wing coverts, singling to	Constant				627424	
2016 210 15505	Trees Courtheau	TREC	la stale a tel	7/12/2016	7/12/2016	Dead, fresh	0.0.1	top of head and left side of	Scorched or	2.5.4	2	Deveryheiterete	637431,	N 10
2016_219_15EG5	Tree Swallow	IKES	incidental	//13/2016	//13/2016	(eyes moist)	0-8 nours	face.	singed	3-Feb	3	Powerblock	3937966	NA
								whole carcass. Evidence of						
								curring to primaries,						
						Deed freed		secondaries, retrices, and	Coorderates				627264	
2016 220 10500	Cliff Swallow		Indidantal	7/14/2010	7/14/2010	Dead, tresh	0.24 haven	nead, race, nape, back,	Scorched or	2 5-6	2	Dowerblash	03/301,	NA
2010_220_ISEGS	CIIII SM9IIOM	CLSW	incidental	//14/2016	//14/2016	(eyes moist)	8-24 nours	rump, and throat.	singea	3-Feb	3	POWERDIOCK	393/929	NA
								vvnoie carcass. Evidence of						
						Dest		tail air sting to both wings and	Control - 1				C27205	
2016 221 10500	Tree Co. II	TREC		7/45/2046	7/45/2046	Dead, fresh	0.24	tail, singeing to top of	Scorched or		_	David LL L	637395,	
2010_221_ISEGS	Tree Swallow	IKES	incidental	//15/2016	//15/2016	(eyes moist)	8-24 nours	nead.	singed	3-Jan	3	POWErblock	3937878	NA

								Whole carcass. Evidence of curling to primaries,						
								secondaries; singeing to						
		0.01/		7/15/2016	7/15/2016	Dead, fresh	0.041	rump, back, and top of	Scorched or	251	2		637427,	
2016_222_ISEGS	Cliff Swallow	CLSW	Incidental	//15/2016	//15/2016	(eyes moist)	8-24 hours	head.	singed	3-Feb	3	Powerblock	3937964	NA
	Northern Rough-					Dead fresh		slight singeing on tips of	Scorched or				637512	
2016 223 ISEGS	winged Swallow	NRWS	Incidental	7/15/2016	7/15/2016	(eves moist)	8-24 hours	primaries.	singed	1	3	Powerblock	3937927	NA
2010_220_10200	Winged Strailott		inclucitui	771072010	771372010	(cycs moist)	021110013	Broken up carcass	Singed	-	3	1 OWCI DIOCK	5557527	
								consisting of all pieces of						
								body and ran over by a						
	Unknown							vehicle. Evidence of singe	Scorched or				637411,	
2016_224_ISEGS	Hummingbird	UNHU	Incidental	7/15/2016	7/15/2016	Broken up	3-6 days	on tips of primaries.	singed	1	3	Powerblock	3937875	NA
						Dead, Semi-								
						fresh (eyes		Whole carcass. No						
				- / /	- / /	desiccated,		evidence of collision or			_		640390,	
2016_225_ISEGS	Cliff Swallow	CLSW	Carcass Survey	7/18/2016	7/18/2016	rigor mortis)	3-6 days	singe.	Unknown	Unk	1	ACC Building	3933521	NA
						Deed Carri		Whole carcass. Evidence of						
						fresh (over		curling to primaries,						
						desiccated		wings tail singed off	Scorched or				640383	
2016 226 ISEGS	Bank Swallow	BANS		7/18/2016	7/18/2016	rigor mortis)	3-6 days	singeing to lower left flank	singed	3-Feb	1		2022527	NA
2010_220_13203	Barrk Swallow	DANS	Carcass Survey	//10/2010	//10/2010	Dead Semi-	5 0 0035	singeing to lower left hank.	Singeo	5100	1	Acc building	5555527	110
						fresh (eves		Whole carcass, No						
						desiccated.		evidence of collision or					640350.	
2016 227 ISEGS	Cliff Swallow	CLSW	Carcass Survey	7/18/2016	7/18/2016	rigor mortis)	3-6 days	singe.	Unknown	Unk	1	ACC Building	3933531	NA
			,				,	Whole carcass. Evidence of				Ŭ		
								curling to primaries,						
						Dead, Semi-		secondaries in both wings,						
						fresh (eyes		tail singed off, singeing to						
	Northern Rough-					desiccated,		both sides of face, rump,	Scorched or				640384,	
2016_228_ISEGS	winged Swallow	NRWS	Carcass Survey	7/18/2016	7/18/2016	rigor mortis)	3-6 days	right and left lower flanks.	singed	3-Feb	1	ACC Building	3933548	NA
						Dead, Semi-								
						fresh (eyes		Whole carcass. No						
	Northern Rough-					desiccated,		evidence of singe or					640405,	
2016_229_ISEGS	winged Swallow	NRWS	Carcass Survey	7/18/2016	7/19/2016	rigor mortis)	2 days	collision.	Unknown	Unk	1	ACC Building	3933551	NA
						Dead, Semi-		Whole carcass. Evidence of						
						fresh (eyes		singeing to every feature of					6400.47	
2016 220 16566	Unknown		Company Community	7/10/2010	7/10/2010	desiccated,		carcass, with wings and tail	Scorched or	2 Fab	1	Davvarblask	640347,	NIA
2010_230_15EGS	nummingbird	UNHU	Carcass Survey	//18/2016	//18/2016	ngor mortis)	3-b days	Whole carcase Evidence of	singed	з-гер	1	POWERDIOCK	3933485	NA NA
								curling to retrices and						
								along wings coverts singe						
						Dead, fresh		on left side of rump and	Scorched or				637458.	
2016 231 ISEGS	Tree Swallow	TRES	Incidental	7/18/2016	7/18/2016	(eves moist)	0-8 hours	nape.	singed	3-Jan	3	Powerblock	3937955	NA
					. ,			Whole carcass. Evidence of	Ŭ					
								curling to both wings and in						
	Costa's					Dead, fresh		tail, sineging to right side of	Scorched or				637469,	
2016_232_ISEGS	Hummingbird	COHU	Incidental	7/18/2016	7/18/2016	(eyes moist)	0-8 hours	face, right flank, and rump.	singed	3-Feb	3	Powerblock	3937909	NA
								Whole carcass. Evidence of						
								curling to primaries and						
								coverts in both wings,						
					- 1	Dead, fresh		singeing to tail and left	Scorched or				637435,	
2016_233_ISEGS	Tree Swallow	TRES	Incidental	7/18/2016	7/18/2016	(eyes moist)	0-8 hours	upper back.	singed	3-Jan	3	Powerblock	3937885	NA
								Feather spot size = large. 7					640426	
2016 224 16566	Loggerhead	1001	Concess Conces	7/10/2010	7/10/2010	Cooth an and	2.4	retrices, 12 remiges found	Linker	NA	A	11-11	640136,	NA
2010_234_ISEGS	Shrike	LUSH	Carcass Survey	//19/2016	//19/2016	reather spot	z days	in 2 ciumps. No singe	Unknown	NA	1	Hellostat	3933425	NA

								Feather spot size = small.						
								Partial right wing (outer						
	Unknown							base, holding primaries					640437,	
2016_235_ISEGS	Swallow	UNSW	Carcass Survey	7/19/2016	7/19/2016	Broken up	3-6 days	together. No singe.	Unknown	NA	1	Heliostat	3933352	NA
						Dead, Semi-		Whole bird. Evidence of						
						fresh (eyes		curling to all tail feathers,						
2016 226 16566	Black-Throated	DTCD	to state state	7/24/2016	0/2/2016	desiccated,	2 .1	singeing to primaries and	Scorched or	2.1	2	Deveenbland	638651,	
2016_236_ISEGS	Sparrow	BISP	Incidental	//21/2016	8/2/2016	rigor mortis)	2 days	Delly. Broken un carcass	singed	3-Jan	2	Powerblock	3935846	NA
								consisting of partial right						
								wing, 4 primaries						
								connected by dried tissue.						
								Evidence of singeing to						
	Northorn Pough							primaries, secondaries and	Scorchod or				629626	
2016 237 ISEGS	winged Swallow	NRWS	Incidental	7/21/2016	7/21/2016	Broken up	2 days	wings.	singed	1	2	Powerblock	3935901	NA
				.,,	///_00			Whole carcass. Evidence of	0.1.800		_			
								curling to several outer						
								retrices, singeing to lower						
2016 220 16566	Costa's	601111	Incidental	7/21/2010	7/21/2010	Dead, fresh	0.0 h a una	right flank and right side of	Scorched or	2 100	2	Devuerbleek	638613,	NIA
2010_238_13EG3	Hummingbird	СОНО	Incidentai	//21/2016	//21/2016	(eyes moist)	0-8 hours	Idce.	singeo	2-J4II	2	POWErDIOCK	3935801	NA
								singe present of right side						
								of face. Curling and						
								Singeing present on						
								primaries, secondaries and						
								injuries later the same day	Scorched or				638627	
2016 239 ISEGS	Tree Swallow	TRES	Incidental	7/22/2016	7/22/2016	alive, injured	0-8 hours	of injuries.	singed	3-Feb	2	Powerblock	3935833	NA
								Whole carcass, Primaries						
								and secondaries on right						
		DUOD		7/25/2016	7/25/2010	Dead, fresh	0.041	wing curled. Head and left	Scorched or	251	2		637456,	
2016_240_ISEGS	Bullok's Oriole	BUOR	Incidental	//25/2016	//25/2016	(eyes moist)	8-24 hours	side singed.	singed	3-Feb	3	Powerblock	3937878	NA
						fresh (eves		Whole carcass with no						
	Northern Rough-					desiccated,		evidence of singe or					637474,	
2016_241_ISEGS	winged Swallow	NRWS	Incidental	7/25/2016	7/25/2016	rigor mortis)	2 days	collision.	Unknown	NA	3	Powerblock	3937961	NA
								Whole carcass. All						
						Dead, Semi-		primaries, secondaries and						
						desiccated.		back, head and underparts	Scorched or				637438.	
2016_242_ISEGS	Cliff Swallow	CLSW	Incidental	7/25/2016	7/25/2016	rigor mortis)	3-6 days	singed.	singed	3-Feb	3	Powerblock	3937979	NA
								Whole carcass, all						
								secondaries, 80% of						
								retricies and 60% of						
								left side of head show signs	Scorched or				637436.	
2016_243_ISEGS	Tree Swallow	TRES	Incidental	7/25/2016	7/25/2016	Mummified	2 weeks	of singeing.	singed	3-Feb	3	Powerblock	3937948	NA
						Dead, Semi-		Whole carcass. Retricies						
						fresh (eyes		and primary flight feathers						
2016 244 15505	Vordin		Incidental	7/25/2016	7/25/2016	desiccated,	2 C dave	curled. Back feathers	Scorched or) Fab	2	Doworklook	637414,	NIA
2010_244_13EGS	veruin	VEKU	incidental	1/23/2010	//25/2010		5-0 udys	Whole carcass with all	singeu	5-rep	3	POWEIDIOCK	232/202	NA
								flight feathers curled or						
								singed off. All parts on						
				- / /	_ != !;			upperside of body show	Scorched or	a = 1	_		637414,	
2016_245_ISEGS	I ree Swallow	TRES	Incidental	//25/2016	//25/2016	Mummitied	2 weeks	signs of singe.	singed	3-Feb	3	Powerblock	3937893	NA

								Whole carcass. All flight						
								feathers curled or singed						
								off. Singeing on the right						
	Northern Rough-							and left side of body. Left	Scorched or				637471	
2016 246 ISEGS	winged Swallow	NRW/S	Incidental	7/25/2016	7/25/2016	Mummified	2 wooks	side of face is singed	singed	3-Eab	3	Powerblock	3037001	NA
2010_240_13203	willgeu Swallow	INITARY 3	incluentai	7/25/2010	772372010	wummeu	2 WEEKS	Mikele enveren Cingeing	Singed	5-160	5	FOWEIDIOCK	3337301	
								whole carcass. Singeing						
						Dead, Semi-		present on primaries,						
						fresh (eyes		secondaries and retricies.						
	Northern Rough-					desiccated,		Left & Right Side of body	Scorched or				638653,	
2016 247 ISEGS	winged Swallow	NRWS	Incidental	7/25/2016	7/25/2016	rigor mortis)	3-6 days	singed	singed	3-Feb	2	Powerblock	3935852	NA
								Broken up carcass. Mostly						
								intact but head is detached						
								from body. Tail footbors						
	L Indua accum							non body. Tai reachers	Coordoodor				(27422	
2016 240 165 66	Unknown			7/20/2046	7/20/2016		2.6.1	curied. Rump and	Scorched of		2		037432,	
2016_248_ISEGS	Hummingbird	UNHU	Incidental	//28/2016	//28/2016	Broken up	3-6 days	secondaries singed.	singed	1	3	Powerblock	3937883	NA
								Whole Carcass. All						
						Dead, Semi-		primaries & secondaries						
						fresh (eyes		curled. Head, upperparts						
	Unknown					desiccated,		and underparts singed. Tail	Scorched or				637434,	
2016 249 ISEGS	Swallow	UNSW	Incidental	7/28/2016	7/28/2016	rigor mortis)	3-6 days	singed off.	singed	3-Feb	3	Powerblock	3937925	NA
				.,,	.,,			Whole carcass Evidence of	8		-			
						Dood fresh		singe on primary 0 of loft	Coorchod or				627205	
2016 250 16566	The Court laws	TREC	In state start	7/20/2016	7/20/2016	Dead, fresh	0.0.1	singe on primary 9 of left	Scorched or	4	2	Deversible als	03/385,	
2016_250_ISEGS	Tree Swallow	TRES	Incidental	//29/2016	//29/2016	(eyes moist)	0-8 hours	wing.	singed	1	3	Powerblock	3937914	NA
								Whole carcass. Evidence of						
	Violet-green					Dead, fresh		singeing to ends of	Scorched or				637421,	
2016_251_ISEGS	Swallow	VGSW	Carcass Survey	8/1/2016	8/1/2016	(eyes moist)	8-24 hours	primaries and tail.	singed	1	3	Powerblock	3937907	NA
								Body cavity and head with						
								right wing attached.						
								Evidence of curling to						
								nrimaries and secondaries						
								on wing, singoing to hood	Scorchod or				627205	
		CLOW	Concern Community	0/1/2010	0/1/2010	Duelien	2a alva	on wing, singeing to head	Scorched of	2 Fab	2	Devuerbleelu	057505,	NIA
2016_252_ISEGS	Cliff Swallow	CLSW	Carcass Survey	8/1/2016	8/1/2016	Broken up	2 weeks	and left side of body.	singed	з-гер	3	Powerblock	3937938	NA
						Dood frosh		Whole carcass Evidence of	Scorchod or				627/12	
2016 252 15505	Vallaw Marblar		Corooce Survey	9/1/2016	9/1/2016	(over moist)	0.9 hours	singe on left side of name	scorched of	1	2	Doworklock	037413,	NIA
2010_253_13EGS	reliow warbier	IVVAK	Carcass Survey	8/1/2010	8/1/2010	(eyes moist)	0-8 nours	singe on left side of hape.	singed	1	3	POWEIDIOCK	3937983	NA
								Whole carcass. Evidence of						
						Dead, Semi-		curling to primaries,						
						fresh (eyes		secondaries, and in						
						desiccated,		retrices, singeing to top of	Scorched or				637502,	
2016_254_ISEGS	Unknown Oriole	UNOR	Carcass Survey	8/1/2016	8/1/2016	rigor mortis)	3-6 days	head.	singed	3-Jan	3	Powerblock	3937937	NA
								Whole carcass. Evidence of						
						Dead, Semi-		curling to all flight feathers						
						fresh (eves		in both wings and in tail						
	Unknown					desiccated		singe to rump upper back	Scorched or				637476	
2016 255 15565	Swallow		Corcoss Survey	9/1/2016	9/1/2016	rigor mortic)	2 days	and nano	scorened of	2 Eab	2		2027056	NA
2010_255_13EG3	SwallOw	010300	Carcass Survey	0/1/2010	0/1/2010		z uays	and hape.	singeu	S-FED	5	ACC Building	5957950	INA
						Dead, Semi-								
						fresh (eyes		Whole carcass. Evidence of						
						desiccated,		curling to several tertials in	Scorched or				637505,	
2016_256_ISEGS	Cliff Swallow	CLSW	Carcass Survey	8/1/2016	8/1/2016	rigor mortis)	2 days	right wing.	singed	1	3	ACC Building	3937963	NA
								2 partial wings with the						
								keel attached to the right						
								wing. Evidence of curling						
								nresent in flight feathers in	Scorched or				637452	
2016 257 1550	House Einch		Carcace Survey	8/1/2016	g /1 /2016	Brokon un	2 wooks	hoth wings	singed	NIA	2	Doworblock	2027062	NIA
2010_237_13E03			Carcass Survey	0/1/2010	0/1/2010	ыокен ир	2 weeks		singeu	INA	3	POWEIDIOCK	200/002	NA
								whole carcass. Evidence of						
								curling to primaries,						
	Northern Rough-							secondaries, and in tail,	Scorched or				637364,	
2016_258_ISEGS	winged Swallow	NRWS	Carcass Survey	8/1/2016	8/1/2016	Mummified	2 weeks	singe present in top of	singed	3-Feb	3	Powerblock	3937991	NA

Image: Construction of the second s									head and upperparts						
Image: constraint of second of se															
2016 219: 0005 UNNOW CARANT SINGLY 87/7216															
Builden Universe Universe Universe NA 3 Heise Heise 2016 2.97 (Mos soulden Universe NA 3 Heise 187.077 2016 2.97 (Mos soulden Universe NA 3 Heise 187.077 2016 2.97 (Mos soulden Universe NA 3 Heise 187.077 2016 2.97 (Mos Soulden Universe NA 3 Heise 187.077 2016 2.97 (Mos Minus Line Line Line Universe NA 3 Heise 187.077 2016 2.97 (Mos Minus Line Line Soulden Universe NA 3 Heise 407.075 2016 2.97 (Mos Minus Line Soulden Universe NA 3 Heise 407.075 2016 2.97 (Mos Minus Soulden Minus Soulden Minus 180.075 180.075 180.075 180.075 180.075 180.075 180.075									Broken up carcass						
Jointown Junistwo									consisting of 4 primaries						
2016 2019 100000 Unknown									held together by a piece of						
2015 259 555 Swithow Unknown Carcins Survey 8/2/2015 8/2/2015 8/0 km up 2 erests Single status N 3 Helioatel 33352.1 MA 2015 259 555 Swithow UNKOW Garcas Survey 8/2/2015 8/2/2015 Bolkerup 2/2 erests Bolkerup status Lukinoen MA 3 Helioatel 33352.1 MA 2015 265 555 seniged Soullow MKWS Garcas Survey 8/2/2015 Bolkerup 2/2 erests Bolkerup status Indicatus 3337.5 MA 2015 265 555 einged Soullow MKWS Garcas Survey 8/2/2015 Bolkerup 2/2 erests Bolkerup Period Bolkerup									dried flesh, 10 individual						
unknome unknome <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>primaries, 12 secondaries,</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									primaries, 12 secondaries,						
2016 2016 2016 2016 2016 2 weree 2 weree Notesting and the second seco									and 5 body feathers. No						
Altis Sulpsiss Section Unitarion NM S Resident System Altis Sulpsiss Section Section <td< td=""><td>2016 250 10500</td><td>Unknown</td><td></td><td></td><td>0/0/0046</td><td>0/0/0046</td><td></td><td>2</td><td>evidence of collision or</td><td></td><td></td><td>2</td><td></td><td>637397,</td><td></td></td<>	2016 250 10500	Unknown			0/0/0046	0/0/0046		2	evidence of collision or			2		637397,	
Low brief bit mode in the province in t	2016_259_ISEGS	Swallow	UNSW	Carcass Survey	8/2/2016	8/2/2016	Broken up	2 weeks	singe.	Unknown	NA	3	Heliostat	3938121	NA
Image: State in the s									Broken up carcass						
Northern Rough- 2016 260 USCS Weiged Swelver New Sector Carces Survey 8/2/2015 B2/2015 B2/2016 B									consisting of 3 primaries						
Norther Rough- Source Source Norther Rough- source Norther									and 4 secondaries held						
Date Number Notion No									individual primarios 7						
Northern Surging Northern Surging<									socondarios and 2 tortials						
2016 260 USGS Winged Swallow NWWS Carcass Survey 8/2/2016 8/2/2016 Broken up (mash Smith frash (sees) 0-16 days Unknown NA 3 Helotstat 3337/55 NA 2016 261 USGS Umknown CLSW Incidential 8/3/2016 8/3/2016 8/3/2016 1/2 days Unknown NA 3 Helotstat 3357/55 NA 2016 261 USGS CLIFSW Incidential 8/3/2016 8/3/2016 7/2 days Carcass All fight and flash days Unknown Unknown Unk 2 Powerblock 8/38/201 NA 2015 262 USGS CLIFF Swallow CLIW Carcass Survey 8/8/2016 8/8/2016 rggr morth J Scorthed or infash regr morth Scorthed or infash regr morth Scorthed or infash regr morth J Scorthed or infash reg		Northern Bough-							No evidence of singe or					637353	
Constraint Cardination Constraint Constraint <thconstraint< th=""> Constraint Constra</thconstraint<>	2016 260 ISEGS	winged Swallow	NRW/S	Carcass Survey	8/2/2016	8/2/2016	Broken un	3-6 days	collision	Unknown	NA	3	Heliostat	3937755	NA
2016 CLIM Incidental 8/3/2016 8/3/2016 8/3/2016 8/3/2016 9	2010_200_10200	iniged offenore		curcuss survey	0/2/2010	0/2/2010	Dead Semi-	5 6 4475		o nationality of the second se		3	Thenostat	5557755	
2012 2012 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>fresh (eves</td><td></td><td>Whole carcass. No</td><td></td><td></td><td></td><td></td><td></td><td></td></th<>							fresh (eves		Whole carcass. No						
2016 261/f Swallow CLSW Incidental 8/3/2016 8/3/2016 ringer morts incidence 3-6 days Collision. Unknown Unknown <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>desiccated,</td><td></td><td>evidence of singe or</td><td></td><td></td><td></td><td></td><td>638584,</td><td></td></th<>							desiccated,		evidence of singe or					638584,	
Dead, Semi- tresh (sys- det scitzed, 2016_262_JSEGS Cliff Swallow CLSW Carcass Survey 8/8/2016 8/8/2016 Na 2016_262_JSEGS Cliff Swallow CLSW Carcass Survey 8/8/2016 8/8/2016 and feathers singed 3-6 days singed 3-6 days singed 3-7 eb 2 Powerblock 638663, 638663, NA 2016_263_JSEGS Lucy's Worbler LUWA Carcass Survey 8/8/2016 8/8/2016 rigor mont/s) 3-6 days singed 3-7 eb 2 ACC Building G38671, G38671, singed Singed 3-7 eb 2 ACC Building G38771, G38573, Singed Singed 3-7 eb 2 ACC Building G38571, G38573, Singed Singed 3-7 eb 2 ACC Building G38573, G38573, Singed Singed 3-7 eb 2 ACC Building G38573, G38573, Singed Singed 3-7 eb 2 ACC Building Singed Singed Singed 3-7 eb 2 ACC Building Singed Singed Singed 3-7 eb 2 ACC Building Singed	2016 261 ISEGS	Cliff Swallow	CLSW	Incidental	8/3/2016	8/3/2016	rigor mortis)	3-6 days	collision.	Unknown	Unk	2	Powerblock	3935887	NA
2016_262_JSECS Cliff Swallow CLSW Carcass Survey 8/8/2016 8/8/2016 8/8/2016 8/8/2016 9/8/8/2016 9/8/2016 9/8/2016							Dead, Semi-		Whole carcass. All flight						
2016 262 [SEGS CHF wallow CL:SW Carcass Survey 8/8/2016 8/8/2016 9/8/2016 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>fresh (eyes</td> <td></td> <td>and tail feathers curled.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							fresh (eyes		and tail feathers curled.						
2016_262_JSEGS CHIF Swallow CLSW Carcass Survey 8/8/2016 rigor mortis) 3-6 days singed 3-7eb 2 Powerblock 3335864 NA Amage State Amage State </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>desiccated,</td> <td></td> <td>Head, dorsal, and breast</td> <td>Scorched or</td> <td></td> <td></td> <td></td> <td>638663,</td> <td></td>							desiccated,		Head, dorsal, and breast	Scorched or				638663,	
2016 263 JSEGS Lucy's Warbler LUWA Carcass Survey 8/8/2016 8/8/2016 Biole	2016_262_ISEGS	Cliff Swallow	CLSW	Carcass Survey	8/8/2016	8/8/2016	rigor mortis)	3-6 days	singed.	singed	3-Feb	2	Powerblock	3935864	NA
2016 263 JSEGS Luwy Warbler Luwa Carcass Survey 8/8/2016 8/8/2016 Res/ res/ res/ res/ desic.cated, desic.cated, desic.cated, Source of singed Source of singed 3-Feb 2 ACC Building 3335907 NA 2016 263 JSEGS Lucy's Warbler LUWA Carcass Survey 8/8/2016 8/8/2016 8/8/2016 8/8/2016 8/8/2016 8/8/2016 8/8/2016 Source of res/ res/ desic.cated, Source of singed. 3-Feb 2 ACC Building 3335907 NA 2016 264.JSEGS Trees Carcass Survey 8/8/2016 8/8/2016 Dead, fresh (res/ res/ res/ res/ res/ res/ res/ res/									Whole carcass. All flight						
2016_263_ISEGS Lucy's Warbler LUWA Carcass Survey 8/8/2016 8/8/2016 8/8/2016 a/8/2016 a/8/2016 a/6 a/6 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>feathers (excepting one</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									feathers (excepting one						
2016_263_JSEGS Lucy's Warbler LUWA Carcass Survey 8/8/2016 8/8/2016 rigor mortis) 3-6 days singed 3-Feb 2 ACC Building 3335907 NA 2016_263_JSEGS Lucy's Warbler LUWA Carcass Survey 8/8/2016 8/8/2016 rigor mortis) 3-6 days singed 3-Feb 2 ACC Building 3335907 NA 2016_264_JSEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 teres moist) 0-8 hours and tog of head with singe. singed 3-Feb 2 Powerblock 3335893 NA 2016_264_JSEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 teres moist) 0-8 hours and tog of head with singe. singed 3-Feb 2 Powerblock 3335893 NA 2016_265_JSEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed 3-Feb 2 Powerblock 3335883 NA 2016_266_JSEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed 10 contour freatwers and tongo 5 6338422, 5 5 6338422,							Dead, Semi-		right wing primary) singed						
2016 263 JSEGS LUWA Carcass Survey 8/8/2016 result 3-6 days singed 3-eb 2 ACC Building 33-9307 NA 2016 263 JSEGS LUWA Carcass Survey 8/8/2016 regor mortis 3-6 days singed 3-eb 2 ACC Building 33-9307 NA 2016 263 JSEGS LUWA Carcass Survey 8/8/2016 regor mortis 3-6 days singed 3-eb 2 ACC Building 33-9307 NA 2016 264 JSEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 leyes moist) 0-8 hours and top of head with singe, singed 3-eb 2 Powerblock 3935893 NA 2016 265 JSEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2015 Broken up 3-6 days singed 3-eb 2 Powerblock 3935883 NA 2016 265 JSEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed 3-eb 2 4CC Building 3935883 NA 2016 265 JSEGS Vellow Warbl							fresh (eyes		to point of severe damage.					<u></u>	
2016_265_15ECS LUCYS Warbler ALC Building 335390/ NA 2016_264_15EGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 (eyes moist) 0-8 hours and top of head with singe. singed 3-Feb 2 ALC Building 335390/ NA 2016_265_15EGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 (eyes moist) 0-8 hours and top of head with singe. singed 3-Feb 2 Powerblock 3935893 NA 2016_265_15EGS UNknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singe. Unknown NA 2 Heliostat 3935893 NA 2016_266_15EGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed 2 3 Powerblock 3935893	2016 262 16566	Lucida Marabian	11114/4	CCC _ CCCCCCCCCCCCCCCCCCCCCC _ C	0/0/2016	0/0/2016	desiccated,		Head, flanks, rump with	Scorched or	2.5.4	2		638671,	N 10
2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 0-8 hours and top of head with singe. singed 3-Feb 2 Powerblock 3935893 NA 2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 0-8 hours and top of head with singe. singed 3-Feb 2 Powerblock 3935893 NA 2016_265_ISEGS Tree Swallow UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed. Unknown NA 2 Heliostat 3935883 NA 2016_266_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed. Unknown NA 2 Heliostat 3935883 NA 2016_266_ISEGS Vellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Dead, fresh our fresh (eyes moist) 0-8 hours in right wing, singeing to singed our fresh (eyes moist) Scorched or singe our fresh (eyes moist) 0-8 hours in right moist, singeing to singed our fresh (eyes moist) 0-8 hours in right wing, singeing to singed our fresh (eyes moi	2016_263_ISEGS	Lucy's warbier	LUWA	Carcass Survey	8/8/2016	8/8/2016	rigor mortis)	3-6 days	singe.	singed	3-Feb	2	ACC Building	3935907	NA
2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 8/8/2016 Broken up 3/8/2016 Scorched or singed. Rump, and flanks, and singed. Rump. Ru									whole carcass. All						
2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 B/8/2016 Dead, fresh (eyes moist) 0-8 hours and to of head with singe. and to of head with singe. Scorched or singed. Rum, on flanks, Singed and Rum, on flanks, Scorche or cullision or culling to all feathers and in right wing, singeing to Scorche or Scorche or singed and Rum, on flanks, Scorche or Scorche or singed and Rum, on flanks, Scorche or Scorche or Scorche or Scorche or <									tail footbors curled and						
2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 (eyes moist) 0-8 hours and to of head with singe, singed singed 3-Feb 2 Powerblock 3935893 NA 2016_264_ISEGS Tree Swallow TRES Carcass Survey 8/8/2016 8/8/2016 (eyes moist) 0-8 hours and to of head with singe, consisting of 10 contour feathers attached by skin. No evidence of collision or singed 3-Feb 2 Powerblock 3935893 NA 2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singed 0 NA 2 Heliostat 638482, NA 2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 Broken up 3-6 days singed 1							Dead fresh		singed Rump and flanks	Scorched or				638575	
Letter Strature Mes Carcess of type Op/2016 S/0/2016 Op/2016 O	2016 264 ISEGS	Tree Swallow	TRES	Carcass Survey	8/8/2016	8/8/2016	(eves moist)	0-8 hours	and top of head with singe	singed	3-Feh	2	Powerblock	3935893	NΔ
2016_266_ISEGS UNRDWARDIER YWAR Incidental 8/9/2016 8/9/2016 Broken up 3-6 days Scored or Unknown NA 2 Heliostat 3935883 NA 2016_266_ISEGS Vellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Broken up 3-6 days Scored or Unknown NA 2 Heliostat 3935883 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 (eyes moist) 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 (eyes moist) 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 rigor mortis) 2 days head. singed 1 3 Powerblock 3937912 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 rigor mortis) 2 days <	2010_201_10200		11120	curcuss survey	0,0,2010	0,0,2010		0 0 110013	Broken up carcass	511660	5105	-	1 OWCI DIOCK	555555	
2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days feathers atched by skin. No evidence of collision or singe. Unknown NA 2 Heliostat 3935883 NA 2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 8/9/2016 Whole carcass. Evidence of curling to tail feathers and in right wing, singeing to Unknown NA 2 Heliostat 3935883 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Oead, fresh (eyes moist) 0-8 hours Vhole carcass. Evidence of curling to ail feathers and in right wing, singeing to Scorched or singed 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Whole carcass. Evidence of curling to primaries, secondaries, and in retrices, singeing to top of singed Scorched or singed 1 3 Powerblock 3937912 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 rigor mortis) 2 days head. singed 1 3 Powerblock									consisting of 10 contour						
2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days No evidence of collision or singe. Unknown NA 2 Heliostat 3935883 NA 2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days Whole carcass. Evidence of curling to ail feathers and in right wing, singeing to in right wing, singeing to in right wing, singeing to Scorched or 637441, <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>feathers attached by skin.</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>									feathers attached by skin.						
2016_265_ISEGS Unknown Bird UNBD Carcass Survey 8/9/2016 8/9/2016 Broken up 3-6 days singe. Unknown NA 2 Heliostat 3935883 NA Land Land Land Land Land Land Land Main Main<									No evidence of collision or					638842,	
2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 0-8 hours Incidental Scorched or 637441, 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 0-8 hours Incidental 8/9/2016 637441, 637441, 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 0-8 hours Incidental sead rum, singeing to singed 2 3 Powerblock 3937902 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Velocecrass. Evidence of curling to primaries, secondaries, and in retrices, singeing to top of scorched or Incidental 8/9/2016 637410, Incidental 637451, Incident	2016_265_ISEGS	Unknown Bird	UNBD	Carcass Survey	8/9/2016	8/9/2016	Broken up	3-6 days	singe.	Unknown	NA	2	Heliostat	3935883	NA
2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 Dead, fresh (eyes moist) 0-8 hours left primaries and rump. Scorched or 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Whole carcass. Evidence of curling to primaries, fresh (eyes secondaries, and in desiccated, retrice, singeing to top of rigor mortis) 2 days head. singed 1 3 Powerblock 3937912 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 rigor mortis) 2 days head. singed 1 3 Powerblock 3937912 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 Poed, Semi- fresh (eyes curling to all remaining singed 1 3 Powerblock 3937912 NA Black-Throated Black-Throated <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Whole carcass. Evidence of</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									Whole carcass. Evidence of						
2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 Dead, fresh (eyes moist) in right wing, singeing to left primaries and rump. Scorched or singed 2 3 Powerblock 3937902 NA 2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA Label Lab									curling to tail feathers and						
2016_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 (eyes moist) 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA Vale_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 (eyes moist) 0-8 hours left primaries and rump. singed 2 3 Powerblock 3937902 NA Vale_266_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Whole carcass. Evidence of desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, fresh (eyes desiccated, regions and in retrices, singeing to top immaries, desiccated, regions and in retrices, singeing to top immaries, desiccated, desiccated, regions and retrieves desiccated, regions and retrieves desiccated, desictes, desiccated, desiccated, desiccated, des							Dead, fresh		in right wing, singeing to	Scorched or				637441,	
2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 8/9/2016 Vellow Secondaries, and in retrices, singeing to top of curling to primaries, secondaries, and in retrices, singeing to top of Scorched or 5	2016_266_ISEGS	Yellow Warbler	YWAR	Incidental	8/9/2016	8/9/2016	(eyes moist)	0-8 hours	left primaries and rump.	singed	2	3	Powerblock	3937902	NA
A matrix A matrix Dead, Semi-fresh (eyes curling to primaries, secondaries, and in A matrix									Whole carcass. Evidence of						
2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 secondaries, and in retrices, singeing to top of scorched or singed Scorched or singed 1 3 Powerblock 3937912 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 Veloc Veloc Scorched or singed 1 3 Powerblock 3937912 NA Black-Throated Black-Throated Figs (sparrow) BTSP Incidental 8/9/2016 8/9/2016 rigor mortis) 3 Scorched or curling to all remaining Scorched or curling to all remaining 637451, 637451, 2016_268_ISEGS Sparrow BTSP Incidental 8/9/2016 8/9/2016 rigor mortip 3 Scorched or - 637451,							Dead, Semi-		curling to primaries,						
2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 rigor mortis) 2 days head. Scorched or 1 3 Powerblock 3937912 NA 2016_267_ISEGS Yellow Warbler YWAR Incidental 8/9/2016 8/9/2016 rigor mortis) 2 days head. singed 1 3 Powerblock 3937912 NA Black-Throated Black-Throated Black-Throated Fight feathers, singeing to all remaining flight feathers, singeing to all remaining Scorched or 637451, 637451, 637451, 63937947 NA							tresh (eyes		secondaries, and in	Gaund				CO7110	
ZUID_207_15E0S reliow warpler YWAR Incidental 8/9/2016 Rigor mortis 2 days Nead. singed 1 3 Powerblock 393/912 NA Long_207_15E0S reliow warpler YWAR Incidental 8/9/2016 8/9/2016 Powerblock 1 3 Powerblock 393/912 NA Long_207_15E0S reliow warpler Long Dead, Semi- fresh (eyes Understander Understander Curling to all remaining Understander 637451, 637451, Black-Throated Sparrowy RTSP Incidental 8/9/2016 8/9/2016 rigor mortis 3-6 days head and upper parts singed 3-Eeb 3 Powerblock 3937917 NA	2010 207 10500		104/4 0	lucial t l	0/0/2016	0/0/2016	desiccated,	2 4	retrices, singeing to top of	Scorched or		2	Deviceshile	63/410,	NA
Black-Throated Black-	2010_207_ISEGS	reliow warbler	YWAK	incidental	8/9/2016	8/9/2016	rigor mortis)	∠ days	nead.	singed		3	POWERDIOCK	393/912	NA
Black-Throated Black-							fresh (evec		curling to all remaining						
2016 268 ISEGS Sparrow BTSP Incidental 8/9/2016 8/9/2016 rigor mortis) 3-6 days head and upper parts singed 3-Eeb 3 Dowerblock 30370/7 NA		Black-Throated					desiccated		flight feathers singeing to	Scorched or				637/151	
	2016 268 ISEGS	Sparrow	BTSP	Incidental	8/9/2016	8/9/2016	rigor mortis)	3-6 davs	head and upper parts.	singed	3-Feb	3	Powerblock	3937947	NA

								Whole carcass. Evidence of						
								singeing to head, face,						
								nape, back, rump, and left						
								axillary with all flight						
						Dead, fresh		feathers in both wings and	Scorched or				637442,	
2016_269_ISEGS	Yellow Warbler	YWAR	Incidental	8/9/2016	8/9/2016	(eyes moist)	8-24 hours	tail singed off.	singed	3-Feb	3	Powerblock	3937958	NA
								Whole Carcass. Evidence of						
								curling to secondaries in						
								left wing, singeing to	Coorchod or				627462	
2016 270 15505	Vollow Warblor		Incidental	9/0/201 <i>6</i>	8/0/2016	aliva injurad	0.8 hours	primary coverts in right	Scorched or	1	2	Doworblock	03/403,	NIA
2010_270_13EG3	fellow warbier	TVVAN	Incluental	8/9/2010	8/9/2010	alive, ilijureu	0-8 110013	Whole carcase Evidence of	Siligeu	1	5	POWEIDIOCK	292/912	INA
								curling on primaries and						
								secondaries of left wing						
								singeing to upper parts of	Scorched or				637382	
2016 271 ISEGS	Tree Swallow	TRES	Incidental	8/10/2016	8/10/2016	Mummified	1 month +	body.	singed	1	3	Powerblock	3937913	NA
					-,,			Broken up carcass						
								consisting of partial left						
	Unknown							wing. No evidence of					638006,	
2016 272 ISEGS	Sparrow	UNSP	Carcass Survey	8/15/2016	8/15/2016	Broken up	3-6 days	collision or singe.	Unknown	NA	2	Heliostat	3936802	NA
	•		,			·		Whole carcass. Evidence of						
						Dead, Semi-		curling to secondaries and						
						fresh (eyes		tertials in both wings and in						
						desiccated,		tail, singeing to rump and	Scorched or				640417,	
2016_273_ISEGS	Tree Swallow	TRES	Incidental	8/15/2016	8/15/2016	rigor mortis)	2 days	left lower flank.	singed	3-Jan	1	Powerblock	3933491	NA
								Broken up carcass						
								consisting of body without						
								head. Evidence of singeing	Scorched or				640361,	
2016_274_ISEGS	Mourning Dove	MODO	Incidental	8/15/2016	8/15/2016	Broken up	2 weeks	to body feathers.	singed	3	1	Powerblock	3933477	NA
								Whole carcass. Evidence of						
								curling to left side of rump,						
								singeing to edges of						
				0/15/0010	o / - = /	Dead, fresh		secondaries, tertials in left	Scorched or				640361,	
2016_275_ISEGS	Tree Swallow	TRES	Incidental	8/15/2016	8/15/2016	(eyes moist)	8-24 hours	wing.	singed	3-Jan	1	Powerblock	3933490	NA
								Feather spot size large,						
								consisting of 2 primaries, 3						
								rectrices, 3 secondaries, 5						
	Unknown							feathers, Evidence of singe	Scorchod or				640264	
2016 276 ISEGS	Elycatcher	LINE	Incidental	8/15/2016	8/15/2016	Feather spot	3-6 days	on all the flight feathers	singed	Unk	1	Powerblock	2022/78	NA
2010_270_13203	riyeaterier	ONTE	melaentai	0/15/2010	0/13/2010		5 0 days	Feather spot size large	Singed	Olik	1	TOWEIDIOCK	3333470	110
								consisting of 6 retrices 5						
	Unknown Small							contour feathers. Evidence	Scorched or				640361	
2016 277 ISEGS	Bird	UNID	Incidental	8/15/2016	8/15/2016	Feather spot	3-6 days	of curling to all retrices.	singed	Unk	1	Powerblock	3933478	NA
					0, _0, _0_0		, .	Feather spot size large						
								consisting of 4 primaries, 1						
								secondary, 1 retrix, 10						
	Northern							body feathers. No evidence					640367,	
2016_278_ISEGS	Mockingbird	NOMO	Incidental	8/15/2016	8/15/2016	Feather spot	3-6 days	of collision or singe.	Unknown	NA	1	Powerblock	3933480	NA
								Broken up carcass						
								consisting of partial left						
								wing. Evidence of curling to						
	Unknown Small							all major flight feathers,	Scorched or				640360,	
2016_279_ISEGS	Bird	UNID	Incidental	8/15/2016	8/15/2016	Broken up	3-6 days	singeing to coverts.	singed	Unk	1	Powerblock	3933484	NA
								Feather spot size small,						
								consisting of 2 primaries.						
	Unknown			0/45/0000	0/45/2010			Evidence of curling to all	Scorched or				640364,	
2016_280_ISEGS	Swallow	UNSW	incidental	8/15/2016	8/15/2016	Feather spot	3-6 days	teatners.	singed	Unk	1 1	Powerblock	3933478	NA

2016 281 ISEGS	MacGillivray's Warbler	MGWA	Carcass Survey	8/16/2016	8/16/2016	Dead, Semi- fresh (eyes desiccated, rigor mortis)	3-6 davs	Whole carcass. Evidence of singeing to all upperparts and breast, all flight feathers in wings and tail singed off.	Scorched or singed	3-Feb	1	ACC Building	640372, 3933524	NA
 2016_282_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/16/2016	8/16/2016	Dead, fresh (eyes moist)	8-24 hours	Whole carcass. Evidence of curling to retrices, flight feathers in wings singed off, singeing to head, nape, and rump.	Scorched or singed	3-Feb	1	ACC Building	640357 <i>,</i> 3933521	NA
2016 292 ISECS	Brown-headed	висо	Carcase Survey	8/16/2016	8/16/2016	Dead, Semi- fresh (eyes desiccated,	2.6 days	Whole carcass. Evidence of curling to all flight feathers (singed off), singeing to all	Scorched or	2 Eob	1		640349,	NIA
2010_205_15E05	cowbird	Brico		8,10,2010	8/10/2010	Dead, Semi- fresh (eyes	<u>3-0 uays</u>	Whole carcass. Evidence of curling to primaries, secondaries and retrices,	Singed	5160	1	Acc building	640201	
2016 294 15565	Vollow Warbler		Carcass Survey	9/16/2016	9/16/2016	desiccated,	2 6 days	singeing to head, neck,	Scorched or	2 Eab	1		640391, 2022542	NA
2010_284_ISEGS		TVVAK	Carcass survey	0/10/2010	0/10/2010	Dead Semi-	5-0 udys	Whole carcass Evidence of	singea	3-FED		ACC Building	5355743	NA
						fresh (eves		curling to all flight feathers						
						desiccated,		in wing and tail, singeing to	Scorched or				640368,	
2016_285_ISEGS	Tree Swallow	TRES	Carcass Survey	8/16/2016	8/16/2016	rigor mortis)	3-6 days	top of head and back.	singed	3-Feb	1	ACC Building	3933547	NA
	Unknown					Dead, Semi- fresh (eyes desiccated,		Whole carcass. Evidence of singeing to tips of primaries on left wing, and top of	Scorched or				640274,	
2016_286_ISEGS	Hummingbird	UNHU	Carcass Survey	8/16/2016	8/16/2016	rigor mortis)	3-6 days	head.	singed	NA	1	Powerblock	3933539	NA
2016_287_ISEGS	Western Kingbird	WEKI	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 days	consisting of 4 retrices, 3 primaries, and 3 secondaries. No evidence of collision or singe.	Unknown	Unk	1	Heliostat	640507, 3933621	NA
2016 288 ISEGS	Unknown Swallow	UNSW	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 davs	Feather spot size small, consisting of 4 primaires,1 secondary, 1 retrix, and 5 body feathers. Evidence of singe on all flight feathers.	Scorched or singed	Unk	1	Heliostat	640481 <i>,</i> 3933555	NA
			,				,	Feather spot size large,	<u> </u>					
								consisting of 6 retrices, 30						
				0/17/0010	0/47/2046			body feathers. No evidence					640474,	
2016_289_ISEGS	Killdeer	KILL	Carcass Survey	8/1//2016	8/1//2016	Feather spot	2 Weeks	of collision of singe.	Unknown	Unk	1	Hellostat	3933545	NA
2016 200 ISEGS	Tree Swallow	TRES	Incidental	8/17/2016	8/17/2016	fresh (eyes desiccated,	2 weeks	Whole carcass. Evidence of singe on primaries of left	Scorched or	1	3	Powerblock	637405 <i>,</i> 3937946	NA
2010_200_10200		TRES	incluentai	0/1//2010	0/1//2010	ligor mortisj	2 WCCR3	Whole carcass. No	Singed		5	TOWEIDIOEK	3337340	NA .
	Lesser							evidence of collision or					637462 <i>,</i>	
2016_291_ISEGS	Nighthawk	LENI	Incidental	8/17/2016	8/17/2016	Mummified	2 weeks	singe.	Unknown	NA	3	Powerblock	3937940	NA
	Unknown Small							Broken up carcass consisting of intact tail, sternum, 9 secondaries, 6 primaries, and 50 body feathers. No evidence of					640267,	
2016_292_ISEGS	Bird	UNID	Carcass Survey	8/17/2016	8/17/2016	Broken up	2 weeks	collision or singe.	Unknown	NA	1	Heliostat	3933279	NA
2016 202 15505			Carcase Survey	0/17/2016	0/17/2016	Footbor mot		Feather spot size large, consisting of 5 retrices, 9 primaries, 6 secondaries, and 50 body footbars	Scorched or	العار		Holicstot	640211,	NA
2010_233_12EQ2	Lazun Bunting	LAZB	Carcass Survey	8/1//2010	0/1//2010	reather spot	3-o days	and 50 body reathers.	singea	UNK	1 1	nenostat	3933397	INA

								Estiday as a founding and						
								Evidence of curling and						
								singeing to secondaries and						
								some body feathers.						
								Feather spot size small,						
								consisting of 3 primaries, 1						
								secondary. Evidence of						
	Northern							curling on tips of flight	Scorched or				640212,	
2016_294_ISEGS	Mockingbird	NOMO	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 days	feathers.	singed	Unk	1	Heliostat	3933395	NA
								Feather spot size small,						
								consisting of 1 primary, 2						
								flight feathers, and 16 body						
								feathers. Evidence of	Scorched or				640212	
2016 295 ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/17/2016	8/17/2016	Feather spot	2 days	curling to all flight feathers	singed	Unk	1	Heliostat	3933395	NA
			carcass carrey	0/1//2010	0/1//2010	· cutilei opot	2 00,0	Feather spot size large	0800	0111	-			
								consisting of 75 body						
	Linknown Small							foothers Evidence of singe	Scorchod or				640156	
	Dird		Caraasa Surrisov	0/17/2016	9/17/2016	Footbor coot	2 C davis	en several body footbors	Scorched of	2	1	Heliestet	040150,	NIA
2010_290_13EG3	BILO	UNID	Carcass Survey	8/1//2010	8/1//2010	Feather spot	3-0 uays	On several body reathers.	singed	3	1	Hellostat	3933407	NA
								Feather spot size large,						
								consisting of 7 primaries, 2						
								secondaries, 30 body						
								feathers. No evidence of					640144,	
2016_297_ISEGS	Killdeer	KILL	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 days	collision or singe.	Unknown	NA	1	Heliostat	3933515	NA
								Feather spot size large,						
								consisting of 8 primaries, 8						
								retrices, 6 secondaries, and						
								6 body feathers. No						
	Lesser							evidence of collision or					640155,	
2016_298_ISEGS	Nighthawk	LENI	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 days	singe.	Unknown	Unk	1	Heliostat	3933544	NA
								Whole carcass. No						
						Dead, fresh		evidence of collision or					640146,	
2016_299_ISEGS	Yellow Warbler	YWAR	Carcass Survey	8/17/2016	8/17/2016	(eyes moist)	8-24 hours	singe.	Unknown	Unk	1	Heliostat	3933600	NA
								Feather spot size large,						
								consisting of 2 retrices, 2						
								primaries, 4 secondaries.						
	Unknown Small							and 2 tertials. Evidence of	Scorched or				640211,	
2016 300 ISEGS	Bird	UNID	Carcass Survey	8/17/2016	8/17/2016	Feather spot	3-6 days	singe on retrices.	singed	Unk	1	Heliostat	3933397	NA

Appendix B. Additional Detection Data for Fatality Estimates and Documentation of Fatality Estimates in Which Each Detection Was Included.

			Distance from					Time Since Last								
USFWS #	Species Code	Location	Tower (m)	Bird Size	Model Size	Cause of Death	How Found	Survey (days)	Used in Estimator	Tower Area	Power Block	Inner HD	Heliostat Area	Unit Fence	Collector Line	Estimator Notes
		Outer			Feather											
2016_189_ISEGS	NRWS	Segment	1111	Small	Spot	unknown	Fatality Search	6	Yes				Х			
				c "	Small			45								
2016_190_ISGES	UNID	ACC	96	Small	Carcass	singed	Fatality Search	15	Yes	X	X					
2016 101 ISEGS		Power	65	Small	Small	singed	Fatality Search	15	Voc	x	x					
2010_101_10100		DIOCK	05	Sinan	Small	Singed		15	163		~					
2016 192 ISEGS	CLSW	ACC	46	Small	Carcass	singed	Fatality Search	14	Yes	x	x					
		Power			Small		,									
2016_193_ISEGS	OCWA	Block	58	Small	Carcass	singed	Fatality Search	14	Yes	х	х					
					Small											
2016_194_ISEGS	MGWA	Inner HD	183	Small	Carcass	collision	Fatality Search	16	Yes	Х		Х				
					Feather											
2016_195_ISEGS	UNGR	Inner HD	232	Large	Spot	unknown	Fatality Search	19	Yes	X		Х				
		100	F1	Lavas	Feather	other	Fatality Cooreb	21	Vaa	V	v					
2016_196_ISEGS	UNLB	ACC	51	Large	Spot	(entrapment)	Fatality Search	21	Yes	X	X					
2016 197 ISEGS	GRRO	Inner Segment	485	Large	Large	unknown	Fatality Search	25	Yes				x			
	Ghino	Power	105	Luige	Small			23	105				~			
2016 198 ISEGS	CLSW	Block	10	Small	Carcass	singed	Incidental	1(1)	Yes	x	x					
					Small											
2016_199_ISEGS	UNHU	ACC	50	Small	Carcass	singed	Fatality Search	26	Yes	х	х					
					Small											
2016_200_ISEGS	BTSP	ACC	47	Small	Carcass	singed	Fatality Search	26	Yes	Х	Х					
					Feather											
2016_201_ISEGS	UNID	Inner HD	200	Small	Spot	collision	Fatality Search	21	Yes	X		Х				
	DTCN	100	47	Cmall	Small	singod	Fatality Coareb	21	Vac	v	v					
2010_202_13EG3	DIGN	ACC	47	Silidii	Carcass	singeu	Fatality Search	21	165	^	^					
2016 203 ISEGS	VERD	Block	20	Small	Carcass	singed	Fatality Search	21	Yes	x	x					
		Power			Feather											
2016_204_ISEGS	UNSW	Block	25	Small	Spot	singed	Fatality Search	21	Yes	x	х					
		Power			Small						1					
2016_205_ISEGS	TRES	Block	45	Small	Carcass	singed	Fatality Search	21	Yes	Х	x					
		Power			Small											
2016_206_ISEGS	COHU	Block	35	Small	Carcass	singed	Fatality Search	21	Yes	Х	X					
		Power			Small		_									
2016_207_ISEGS	COHU	Block	90	Small	Carcass	singed	Fatality Search	21	Yes	Х	Х					

2015 2016 2016 2016 2017 2016 2017 2016 2017 2016 2017 2016 2017 2016 2017 2016 2017 <th< th=""><th></th><th></th><th>Outer</th><th></th><th></th><th>Feather</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>			Outer			Feather											
2016 209_ISEGS BTSP Block 30 Small Small Small Small Incidental 1(1) No X X X No No X X No No No X X No No X X No No No X X No No <td>2016_208_ISEGS</td> <td>LBCU</td> <td>Segment</td> <td>668</td> <td>Large</td> <td>Spot</td> <td>unknown</td> <td>Fatality Search</td> <td>34</td> <td>Yes</td> <td></td> <td></td> <td></td> <td>Х</td> <td></td> <td></td> <td></td>	2016_208_ISEGS	LBCU	Segment	668	Large	Spot	unknown	Fatality Search	34	Yes				Х			
2016 202 JSEGS Block 30 Small Carcass singed Incidental 1(1) No X X X Dider than Search Interval 2016 212 JSEGS BTON Block 10 Small Carcass singed Incidental 1(1) Yes X<			Power			Small											
2016 210_JSEGSBTGNBick10Small SmallSmall CarcassIncidental1(1)YesXXXA2016 211_JSEGSUNHUBiock27Small CarcassCarcasssingedIncidental1(1)YesXXAAA2016 211_JSEGSUNHUBiock28Small CarcasscarcasssingedIncidental1(1)YesXXAAA2016 213_JSEGSUNHUBiock28Small CarcassSingedIncidental1(1)NoXXAAAA2016 213_JSEGSUNHUBiock28Small CarcassSingedIncidental1(1)NoXXAAAA2016 213_JSEGSUNHUBiock28Small SmallCarcassSingedFatality Search14YesXXAAA2016 215_JSEGSUNIDPower Biock37Small SpotSpotsingedFatality Search14NoXXAAA2016_217_JSEGSUNIDBiock0Small SpotsingedFatality Search14NoXXXAAA2016_217_JSEGSUNIDBiock7Small SpotsingedFatality Search14NoXXXAAA2016_217_JSEGSUNIDBiock7Small Spot <td< td=""><td>2016_209_ISEGS</td><td>BTSP</td><td>Block</td><td>30</td><td>Small</td><td>Carcass</td><td>singed</td><td>Incidental</td><td>1(1)</td><td>No</td><td>Х</td><td>Х</td><td></td><td></td><td></td><td></td><td>Older than Search Interval</td></td<>	2016_209_ISEGS	BTSP	Block	30	Small	Carcass	singed	Incidental	1(1)	No	Х	Х					Older than Search Interval
2016 2016 <th< td=""><td></td><td></td><td>Power</td><td></td><td></td><td>Small</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>			Power			Small											
Power 2016_211_ISEGSUNHU BlockBlock27Small SmallSingedIncidental1(1)YesXXXAAAA2016_212_ISEGSRUHU Block28Small SmallCarcasssingedIncidental1(1)YesXXAA	2016_210_ISEGS	BTGN	Block	10	Small	Carcass	singed	Incidental	1(1)	Yes	X	X					
2016_211_SEGS UNH0 Block 27 Small Carcass singed Incidential 1(1) Yes X X V V 2016_212_ISEGS RUHU Block 28 Small Carcass singed Incidential 1(1) Yes X X V	2016 211 16506		Power		C U	Small											
2016 212 JSEGS RUH Block 28 Small Garcass singed Incidental 1(1) Yes X X X A <t< td=""><td>2016_211_ISEGS</td><td>UNHU</td><td>BIOCK</td><td>27</td><td>Small</td><td>Carcass</td><td>singed</td><td>Incidental</td><td>1(1)</td><td>Yes</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td></t<>	2016_211_ISEGS	UNHU	BIOCK	27	Small	Carcass	singed	Incidental	1(1)	Yes	X	X					
2016_212_[SEGS Roll Book 28 Small Carcass singed Incidental 1(1) Yes X X V Older than Search Interval 2016_213_[SEGS UNHU Block 28 Small Carcass singed incidental 1(1) No X X V Older than Search Interval 2016_213_[SEGS UNU Block 35 Small Carcass singed Fatality Search 14 Yes X X V Older than Search Interval 2016_215_[SEGS UNU Block 37 Small Spot singed Fatality Search 14 Yes X X V Older than Search Interval 2016_215_[SEGS WTSW Block 0 Small Spot singed Fatality Search 14 Yes X X V Older than Search Interval 2016_216_[SEGS LENI Inner HD 221 Small Spot singed Fatality Search 14 No X X V Older than Search Interval 2016_212_[SEGS			Power	20	Creat	Small	ain an al	Incidental	1(1)	Vac	V	V					
Power 2016_213_ISEGSUNHU BlockBlock28Small SmallCarcasssingedFatality Search14YesXXAOlder than Search Interval2016_214_ISEGSLUWAACC35SmallCarcasssingedFatality Search14YesXXAAA<	2010_212_13EG3	копо	BIOCK	28	Small		singeu	Incluental	1(1)	res	^	×					
2010_213_15123 01M0 atcx 23 3mail Catcass singed incuterial 1(1) No X	2016 212 15565		Power	20	Small	Small	singod	Incidental	1(1)	No	v	v					Older than Search Interval
2016_214_ISEGSLUWAACC35SmallCarcasssingedFatility Search14YesXXXAAA2016_215_ISEGSUNIDBlock37SmallSpotsingedFatility Search14NoXXAAOlder than Search Interval2016_216_ISEGSWTSWBlock0SmallSpotsingedFatility Search14NoXXAAA2016_216_ISEGSWTSWBlock0SmallSpotunknownFatality Search14YesXXAAA2016_217_ISEGSLENIInner HD221SmallSpotunknownFatality Search14NoXXAAA2016_218_ISEGSRUHUBlock71SmallSmallSmallFatality Search14NoXXAAA2016_218_ISEGSRUHUBlock71SmallSmallSmallFatality Search14NoXXXAA2016_218_ISEGSRUHUBlock62SmallSmallCarcasssingedFatality Search14YesXXAAA2016_218_ISEGSRUHUBlock62SmallCarcasssingedIncidental1(1)YesXXAAA2016_220_ISEGSCLSWBlock114SmallCarcasssinge	2010_213_13L03	UNITO	DIOCK	20	Jillali	Carcass	Siligeu	incluentai	1(1)		~	^					
2010_214_0000 EVMIN Accord and a single of framework of the fram	2016 214 ISEGS	111\\\/A	ACC	35	Small	Carcass	singed	Fatality Search	14	Yes	x	x					
2016_215_ISEGS UNID Block 37 Small Spot singed Fatality Search 14 No X X Image: Control of the state of th	2010_214_10200	2011/1	Power	55	Sindi	Eesther	Singed	rutanty scaren	<u> </u>	105	~	~					
Discrete 2016_216_1SEGSDiscrete Power BlockDiscrete Power BlockDiscrete Power SpotDiscrete <td>2016 215 ISEGS</td> <td>UNID</td> <td>Block</td> <td>37</td> <td>Small</td> <td>Spot</td> <td>singed</td> <td>Fatality Search</td> <td>14</td> <td>No</td> <td>x</td> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td>Older than Search Interval</td>	2016 215 ISEGS	UNID	Block	37	Small	Spot	singed	Fatality Search	14	No	x	x					Older than Search Interval
2016_216_ISEGSWTSWBlock0SmallSportsingedFatality Search14YesXXAAAA2016_217_ISEGSLENIInner HD221SmallSportunknownFatality Search14NoXXXAOlder than Search Interval2016_218_ISEGSRUHUBlock71SmallSmallSingedFatality Search14YesXXAAOlder than Search Interval2016_218_ISEGSRUHUBlock71SmallCarcasssingedFatality Search14YesXXAAA2016_219_ISEGSTRESBlock62SmallCarcasssingedIncidental1(1)YesXXAAA2016_220_ISEGSCLSWBlock114SmallCarcasssingedIncidental1(1)YesXXAAA2016_221_ISEGSTRESBlock79SmallCarcasssingedIncidental1(1)YesXXAAAA2016_222_ISEGSCLSWBlock69SmallCarcasssingedIncidental1(1)YesXXAAAAA2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXAAAAAA2016_223_ISEGS			Power			Feather											
PowerPowerSmallSmallGoPowerItNoXXXOlder than Search Interval2016_219_ISEGSLENIInner HD221SmallSmallSmallCarcassSingedFatality Search14NoXXXOlder than Search Interval2016_218_ISEGSRUHUBlock71SmallCarcasssingedFatality Search14YesXXImage: CarcassSinged2016_219_ISEGSTRESBlock62SmallCarcasssingedIncidental1(1)YesXXImage: CarcassImage: CarcassSingedImage: CarcassImage: CarcassSingedImage: CarcassImage: CarcassImage: CarcassImage: CarcassSingedImage: CarcassImage: Car	2016 216 ISEGS	WTSW	Block	0	Small	Spot	singed	Fatality Search	14	Yes	x	х					
2016_217_ISEGS LENI Inner HD 221 Small Spot unknown Fatality Search 14 No X X M Older than Search Interval 2016_218_ISEGS RUHU Block 71 Small Small Carcass singed Fatality Search 14 Yes X X M						Feather		•									
2016_218_ISEGSRUHUPower Block71SmallSmall CarcasssingedFatality Search14YesXXXLLLLL2016_219_ISEGSTRESPower Block62Small 	2016_217_ISEGS	LENI	Inner HD	221	Small	Spot	unknown	Fatality Search	14	No	х		x				Older than Search Interval
2016_218_ISEGSRUHUBlock71SmallCarcasssingedFatality Search14YesXXAAAAAAA2016_219_ISEGSTRESBlock62SmallCarcasssingedIncidental1(1)YesXXXAA <t< td=""><td></td><td></td><td>Power</td><td></td><td></td><td>Small</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			Power			Small											
2016_219_ISEGSTRESPower Block62SmallSmall CarcasssingedIncidental1(1)YesXXX2016_220_ISEGSCLSWPower Block114SmallSmall CarcassSingedIncidental1(1)YesXXX2016_221_ISEGSTRESPower Block79Small CarcassSingedIncidental1(1)YesXXXX2016_222_ISEGSCLSWPower Block69Small SmallSingedIncidental1(1)YesXXXX2016_222_ISEGSCLSWPower Block69Small SmallSingedIncidental1(1)YesXXXX2016_223_ISEGSNRWSPower Block43SmallSingedIncidental1(1)YesXXXX2016_223_ISEGSNRWSPower Block43SmallSingedIncidental1(1)YesXXXX2016_223_ISEGSNRWSPower Block43SmallSingedIncidental1(1)YesXXXXX2016_223_ISEGSNRWSPower Block43SmallSingedIncidental1(1)YesXXXXX2016_223_ISEGSNRWSPower Block43SmallSingedIncidental1(1)YesXXXXX2016_	2016_218_ISEGS	RUHU	Block	71	Small	Carcass	singed	Fatality Search	14	Yes	х	Х					
2016_219_ISEGSTRESBlock62SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_220_ISEGSCLSWBlock114SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_221_ISEGSTRESBlock79SmallCarcasssingedIncidental1(1)YesXXMMMM2016_221_ISEGSTRESBlock79SmallCarcasssingedIncidental1(1)YesXXMMMM2016_222_ISEGSCLSWBlock69SmallCarcasssingedIncidental1(1)YesXXMMMM2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXMMMM2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXMMMM2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXMMMM2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_223_ISEGSNRWS<			Power			Small											
Power 2016_220_ISEGSPower BlockIntalSmallSmallSmallSmallIncidental1(1)YesXXXImage: Constraint of the state of t	2016_219_ISEGS	TRES	Block	62	Small	Carcass	singed	Incidental	1(1)	Yes	Х	Х					
2016_220_ISEGSCLSWBlock114SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_221_ISEGSTRESPower Block79SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_222_ISEGSCLSWPower Block69SmallCarcasssingedIncidental1(1)YesXXMMMMM2016_223_ISEGSNRWSBlock43SmallSmallCarcasssingedIncidental1(1)YesXXMMMMM2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXMMM <td< td=""><td></td><td></td><td>Power</td><td></td><td></td><td>Small</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>			Power			Small											
2016_221_ISEGSTRESPower Block79SmallSmall CarcasssingedIncidental1(1)YesXXXMMMMMM2016_222_ISEGSCLSWPower Block69SmallSmallCarcasssingedIncidental1(1)YesXXXMM<	2016_220_ISEGS	CLSW	Block	114	Small	Carcass	singed	Incidental	1(1)	Yes	Х	Х					
2016_221_ISEGSTRESBlock79SmallCarcasssingedIncidental1(1)YesXXXIncidentalIncidental016_222_ISEGSCLSWPower69SmallCarcasssingedIncidental1(1)YesXXIncidental			Power			Small											
Power Power Small Small Incidental 1(1) Yes X X M	2016_221_ISEGS	TRES	Block	79	Small	Carcass	singed	Incidental	1(1)	Yes	Х	Х					
2016_222_ISEGSCLSWBlock69SmallCarcasssingedIncidental1(1)YesXXXIncidentalIncidental2016_223_ISEGSNRWSBlock43SmallCarcasssingedIncidental1(1)YesXXIncidental <td< td=""><td></td><td></td><td>Power</td><td></td><td></td><td>Small</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>			Power			Small											
Power Power Small Incidental 1(1) Yes X X 2016_223_ISEGS NRWS Block 43 Small Carcass singed Incidental 1(1) Yes X X Power Power Small Small Carcass singed Incidental 1(1) Yes X X X X	2016_222_ISEGS	CLSW	Block	69	Small	Carcass	singed	Incidental	1(1)	Yes	Х	Х					
2016_223_ISEGS NRWS Block 43 Small Carcass singed Incidental 1(1) Yes X X Power Small Small Carcass singed Incidental 1(1) Yes X X			Power			Small											
Power Small Small	2016_223_ISEGS	NRWS	Block	43	Small	Carcass	singed	Incidental	1(1)	Yes	X	X					
	2016 224 16566		Power	60	Currell	Small	aine an al	lu ciele u tel	1(1)	No	X	V					Olden them Connels Internal
2016_224_ISEGS UNHO Block 68 Small Carcass singed incidental I(1) No X X	2016_224_ISEGS	UNHU	BIOCK	08	Small	Carcass	singed	Incidental	1(1)	NO	X	X					Older than Search Interval
2016 225 ISEGS CLSW ACC 20 Small Carcass (ontranmont) Eatality Soarch 22 Vos V V	2016 225 15565		ACC	20	Small	Small	other	Eatality Soarch	22	Voc	v	v					
2010_225_15EGS CLSW ACC 35 Small Carcass (entrapment) Fatality Search 22 Tes A A	2010_225_13EG3	CLSVV	ACC	39	Silidii	Carcass	(entrapment)	Fatality Search	22	165	^	^					
2016 226 ISEGS BANS ACC 39 Small Carcass singed Eatality Search 22 Yes X X	2016 226 ISEGS	BANS	ΔCC	30	Small	Carcass	singed	Fatality Search	22	νος	x	x					
Small other	2010_220_13103	0,1103		55	Jinan	Small	other	Tutunty Search		103				+			
2016 227 ISEGS CLSW ACC 50 Small Carcass (entrapment) Fatality Search 22 Yes X X	2016 227 ISEGS	CLSW	ACC	50	Small	Carcass	(entrapment)	Fatality Search	22	Yes	x	x					
						Small							1				
2016 228 ISEGS NRWS ACC 60 Small Carcass singed Fatality Search 22 Yes X X	2016 228 ISEGS	NRWS	ACC	60	Small	Carcass	singed	Fatality Search	22	Yes	x	x					
Small other						Small	other				1						
2016_229_ISEGS NRWS ACC 68 Small Carcass (entrapment) Fatality Search 22 Yes X X	2016_229_ISEGS	NRWS	ACC	68	Small	Carcass	(entrapment)	Fatality Search	22	Yes	x	x					

		Power			Small									
2016_230_ISEGS	UNHU	Block	29	Small	Carcass	singed	Fatality Search	22	Yes	Х	X			
		Power			Small									
2016_231_ISEGS	TRES	Block	50	Small	Carcass	singed	Incidental	1(1)	Yes	Х	X			
		Power			Small									
2016_232_ISEGS	СОНО	Block	0	Small	Carcass	singed	Incidental	1(1)	Yes	X	X			
2016 222 15505	TDEC	Power	40	Small	Small	singod	Incidental	1(1)	Voc	v	v			
2010_233_13EG5	IKES	ВЮСК	40	Small	Carcass	singed	Incluental	1(1)	res	^				
2016 234 ISEGS	LOSH	Inner HD	245	Small	Feather	unknown	Fatality Search	22	Yes	x	x			
2010_234_13203	20311		245	Sman	Eesther	dilicitowi		22	105	~				
2016 235 ISEGS	UNSW	Inner HD	148	Small	Spot	unknown	Fatality Search	22	Yes	x	x			
		Outside												
		Search -												
		Power												
2016 226 ISECS	BICD	Block/Level	0	Small	Small	singed	Incidental	ΝΑ	No					Outside Standard Search
2010_230_13EG3	DIJF	Dowor	0	Siliali	Carcass	Singeu	Incluentai	INA	NU					Alea
2016 237 ISEGS	NRWS	Block	59	Small	Snot	singed	Incidental	1(1)	No	x	x			Older than Search Interval
	111111	Power		Sinan	Small	511800	melacita	-(-)		<i>x</i>				
2016 238 ISEGS	сони	Block	60	Small	Carcass	singed	Incidental	1(1)	Yes	x	x			
		Power			Small	0								
2016_239_ISEGS	TRES	Block	0	Small	Carcass	singed	Incidental	1(1)	Yes	х	x			
		Power			Small									
2016_240_ISEGS	BUOR	Block	32	Small	Carcass	singed	Incidental	1(1)	Yes	х	X			
		Power			Small									
2016_241_ISEGS	NRWS	Block	51	Small	Carcass	unknown	Incidental	1(1)	No	Х	X			Older than Search Interval
		Power			Small									
2016_242_ISEGS	CLSW	Block	76	Small	Carcass	singed	Incidental	1(1)	No	Х	X			Older than Search Interval
		Power			Small									
2016_243_ISEGS	TRES	Block	51	Small	Carcass	singed	Incidental	1(1)	No	X	X			Older than Search Interval
		Power		Creatil	Small		Incidental	1(1)	Ne	V				Olden they Second later of
2016_244_ISEGS	VERD	BIOCK	55	Small	Carcass	singea	incidental	1(1)	NO	X	X			Ulder than Search Interval
2016 245 19569	TRES	Power	24	Small	Small	singed	Incidental	1(1)	No	x	x			Older than Search Interval
2010_243_13E03		Diock	27	Jillall	Small	Singeu		-(-)		^				
2016 246 ISEGS	NRWS	Block	10	Small	Carcass	singed	Incidental	1(1)	No	x	x			Older than Search Interval
		Outside		- Cintan		5.1.20		-(-)						
		Search -			Small									Outside Standard Search
2016_247_ISEGS	NRWS	Tower	0	Small	Carcass	singed	Incidental	NA	No					Area
		Power			Small									
2016_248_ISEGS	UNHU	Block	44	Small	Carcass	singed	Incidental	1(1)	No	Х	X			Older than Search Interval
		Power			Small									
2016_249_ISEGS	UNSW	Block	38	Small	Carcass	singed	Incidental	1(1)	No	Х	X			Older than Search Interval

2016 250 ISECS	TDEC	Power	84	Small	Small	singed	Incidental	1(1)	Voc	v	v			
2010_230_13EG3	INES	BIOCK	04	SIIIdii	Carcass	Singeu	Incluental	1(1)	165	^	^			
2016 251 ISECS	VGSW	Power	16	Small	Small	singed	Eatality Search	25	Voc	v	v			
2010_231_13L03	V03W	Diuck	40	Jillall	Carcass	Singeu		25	163	^	~			
2016 252 15565		Power	86	Small	Small	singed	Eatality Search	25	Voc	v	v			
2010_232_13L03	CLSVV	Douver	80	Jillall	Carcass	Singeu		25	163	^	~			
2016 253 ISEGS		Power	Q /	Small	Small	singed	Fatality Search	25	Voc	x	x			
2010_255_15L05	TWAN	Device	54	Jillall	Carcass	Singeu		25	163	^	~			
2016 254 ISEGS		Power	13	Small	Small	singed	Fatality Search	25	Voc	x	x			
2010_254_15E05		DIOCK	45	Sman	Carcass	Singeu		25	103	~	X			
2016 255 15565			57	Small	Small	singed	Eatality Search	25	Voc	v	v			
2010_235_13103	011370	ACC	57	Jillall	Carcass	Singeu		25	163	^	~			
2016 256 15565			60	Small	Small	singod	Eatality Soarch	25	Voc	v	v			
2010_230_13103	CLSVV	Acc	08	Jillall	Carcass	Singeu		25	163	^	~			
2016 257 15565		Power	0/	Small	Small	singed	Eatality Search	25	Voc	v	v			
2010_237_13L03	поп	Device	54	Jillall	Carcass	Singeu		25	163	^	~			
2016 259 15565		Power	120	Small	Small	cingod	Eatality Soarch	25	Voc	v	v			
2010_238_13EG3		BIOCK	120	SIIIdii	Carcass	Singeu		23	165	^	^			
2016 250 15565			222	Small	Feather	unknown	Eatality Soarch	25	Voc	v		v		
2010_239_13L03	011370		227	Jillall	Spot	UIIKIIOWII		25	163	^		^		
2016 260 15565			104	Small	Feather	unknown	Eatality Soarch	25	Voc	v		v		
2010_200_13L03	INITAV 3	Dever	194	Jillall	Spot	UIIKIIOWII		25	165	^		^		
2016 261 ISECS		Power	70	Small	Small	unknown	Incidental	1(1)	No	v	v			Older than Search Interval
2010_201_13E03	CLSVV	Dowor	75	Sman	Carcass	dikilowii	incluentai	1(1)		~				
2016 262 ISEGS		Power	20	Small	Small	singed	Fatality Search	26	Voc	x	x			
2010_202_13E03	CLSVV	DIOCK	20	Sman	Carcass	Singeu		20	103	~				
2016 263 ISEGS		ACC	64	Small	Small	singed	Fatality Search	26	νος	x	x			
2010_205_15E05	LOWA	Dowor	04	Jinan	Cmall	Singed		20	103	~	~			
2016 264 ISEGS	TRES	Power	88	Small	Small	singed	Fatality Search	26	Voc	x	x			
2010_204_13E03	TILLS	DIOCK	00	Sman	Carcass	Singeu		20	103	~				
2016 265 ISEGS		Inner HD	105	Largo	Spot	unknown	Fatality Search	27	Voc	x		x		
2010_203_13E03		Dower	1.55	Luige	Small			21	103			~		
2016 266 ISEGS	Υ\Λ/ΔR	Block	40	Small	Carcass	singed	Incidental	1(1)	Yes	x	x			
2010_200_13E03		Dowor	40	Sman	Carcass	Singeu	incluentai	1(1)	103	~				
2016 267 ISEGS	VW/AR	Block	50	Small	Carcass	singed	Incidental	1(1)	No	x	x			Older than Search Interval
2010_207_13E03		Bower	50	Jinan	Carcass	Singed	Incluentai	1(1)		~	~			
2016 268 ISEGS	BTSD	Block	35	Small	Carcass	singed	Incidental	1(1)	No	x	x			Older than Search Interval
2010_200_13103		Dowor	55	Sman	Cmall	Singea		±(±)						
2016 269 ISEGS	YW/AR	Block	48	Small	Carcass	singed	Incidental	1(1)	Yes	x	x			
2010_209_13103		Dour	+0	Jinali	Cmall	JIIgeu		-(-)	163	^	^			
2016 270 15565		Block	0	Small	Small	singed	Incidental	1(1)	Vec	x	x			
2010_270_13E03		DIUCK	0	Jillall	Circass	Singeu		-()	163	^	^			
2016 271 19569	TRES	Power	88	Small	Small	singed	Incidental	1(1)	No	x	x			Older than Search Interval
2010_211_12602	INES	DIUCK	00	JIIIdil	Carcass	Singen	incluental	1(1)		^	^		I	

		Outer			Small										
2016_272_ISEGS	UNSP	Segment	1150	Small	Carcass	unknown	Fatality Search	20	Yes				х		
		Power			Small										
2016_273_ISEGS	TRES	Block	51	Small	Carcass	singed	Incidental	1(1)	No	Х	х				Older than Search Interval
		Power			Large										
2016_274_ISEGS	MODO	Block	5	Large	Carcass	singed	Incidental	1(1)	No	Х	Х				Older than Search Interval
		Power			Small										
2016_275_ISEGS	TRES	Block	11	Small	Carcass	singed	Incidental	1(1)	Yes	Х	Х				
		Power			Feather										
2016_276_ISEGS	UNFL	Block	4	Small	Spot	singed	Incidental	1(1)	No	Х	X				Older than Search Interval
		Power			Feather										
2016_277_ISEGS	UNID	Block	6	Small	Spot	singed	Incidental	1(1)	No	Х	X				Older than Search Interval
2016 270 16566	NOMO	Power	6	Currell	Feather		lu sidentel	1(1)	No	V	X				Olden them Connels Internel
2016_278_ISEGS	NOMO	ВІОСК	6	Small	Spot	unknown	Incidental	1(1)	NO	X	X				Older than Search Interval
2016 270 15505		Power	16	Small	Feather	singod	Incidental	1(1)	No	v	v				Older then Search Interval
2010_279_15EG3	UNID	BIOCK	10	Small	Spot	Singeo	Incluental	1(1)	NO	×	^				Older than search interval
2016 280 15565		Power	1	Small	Feather	singod	Incidental	1(1)	No	v	v				Older than Search Interval
2010_280_13203	011370	DIUCK	4	SIIIdii	Spot	Singeu	incluentai	1(1)	NO	^	^				
2016 281 15565		٨٢٢	20	Small	Small	singed	Eatality Search	20	Voc	x	v				
2010_201_13LU3	NUUVA	ACC	30	Jillall	Curcass	Singeu		25	163	^	^				
2016 282 ISEGS		٨٢٢	38	Small	Small	singed	Fatality Search	20	Voc	x	x				
2010_202_13EG3			50	Sman	Carcass	Singeu		25	163	~	~				
2016 283 ISEGS	внсо	ACC	42	Small	Carcass	singed	Fatality Search	29	Yes	x	x				
2010_203_13203	Direc	1.00	12	Sinan	Small	511500		25	105	<i>x</i>					
2016 284 ISEGS	YWAR	ACC	62	Small	Carcass	singed	Fatality Search	29	Yes	x	x				
					Small	0									
2016 285 ISEGS	TRES	ACC	63	Small	Carcass	singed	Fatality Search	29	Yes	х	x				
		Power			Small	0	,								
2016 286 ISEGS	UNHU	Block	109	Small	Carcass	singed	Fatality Search	29	Yes	х	x				
					Feather	<u> </u>	,								
2016_287_ISEGS	WEKI	Inner HD	195	Small	Spot	unknown	Fatality Search	29	Yes	х		х			
					Feather										
2016_288_ISEGS	UNSW	Inner HD	132	Small	Spot	singed	Fatality Search	29	Yes	х		х			
					Feather										
2016_289_ISEGS	KILL	Inner HD	NA	Large	Spot	unknown	Fatality Search	29	Yes	х		х			
		Power			Small										
2016_290_ISEGS	TRES	Block	77	Small	Carcass	singed	Incidental	1(1)	No	Х	Х				Older than Search Interval
		Power			Small										
2016_291_ISEGS	LENI	Block	36	Small	Carcass	unknown	Incidental	1(1)	No	Х	х				Older than Search Interval
					Small										
2016_292_ISEGS	UNID	Inner HD	231	Small	Carcass	unknown	Fatality Search	29	Yes	Х		Х			
					Feather										
2016_293_ISEGS	LAZB	Inner HD	184	Small	Spot	singed	Fatality Search	29	Yes	Х		Х			

2016_294_ISEGS	NOMO	Inner HD	179	Small	Feather Spot	singed	Fatality Search	29	Yes	x	x		
2016_295_ISEGS	YWAR	Inner HD	180	Small	Feather Spot	singed	Fatality Search	29	Yes	x	x		
2016_296_ISEGS	UNID	Inner HD	212	Small	Feather Spot	singed	Fatality Search	29	Yes	x	x		
2016_297_ISEGS	KILL	Inner HD	227	Large	Feather Spot	unknown	Fatality Search	29	Yes	x	x		
2016_298_ISEGS	LENI	Inner HD	221	Small	Feather Spot	unknown	Fatality Search	29	Yes	x	x		
2016_299_ISEGS	YWAR	Inner HD	248	Small	Small Carcass	unknown	Fatality Search	29	Yes	x	x		
2016_300_ISEGS	UNID	Inner HD	184	Small	Feather Spot	singed	Fatality Search	29	Yes	x	x		