

## **CHAPTER 6: RARE VERTEBRATE MANAGEMENT**

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OANRP manages or monitors three vertebrate species, Hawaiian Monarch Flycatcher (Oahu Elepaio), Hawaiian Goose (Nene), and the Hawaiian Hoary Bat (Opeapea). There have been no sightings this year of Nene on Army Installations and thus there is no Nene update included in this chapter. Results of our management and monitoring efforts for Oahu Elepaio and Opeapea are presented below.

### **6.1 OIP ELEPAIO MANAGEMENT 2017**

#### **6.1.1 Background**

In 2000, the U.S. Fish and Wildlife Service (USFWS) granted the Oahu Elepaio (*Chasiempis ibidis*) endangered species status under the Federal Endangered Species Act and designated critical habitat on Oahu for the Elepaio in 2001. Under the terms of the Biological Opinion for Routine Military Training and Transformation dated 2003, the Oahu Army Natural Resources Program (OANRP) is required to manage a minimum of 75 Oahu Elepaio pairs. Management of a pair includes monitoring and rodent control during the breeding season. The OANRP is required to conduct on-site management at Schofield Barracks West Range (SBW) for as many of the 75 pairs as possible, with the remaining number managed at off-site locations with cooperating landowners. The OANRP has conducted rodent control and Elepaio monitoring at Schofield Barracks Military Reservation (SBMR) (1998-present), Ekahanui Gulch in the Honouliuli Forest Reserve (2005-present), Moanalua Valley (2005-present), Palehua (2007-present), Makaha Valley (2005-2009), and Waikane Valley (2007-2008). This chapter summarizes Elepaio reproduction results at each of the sites currently managed, and provides recommendations for improving the Elepaio stabilization program. This section also lists and discusses the terms and conditions for the implementation of reasonable and prudent measures outlined in the 2003 Biological Opinion.

#### **6.1.2 Methods**

##### ***Monitoring***

Throughout the nesting season, from early January to late June, each managed Elepaio territory was visited at one or two-week intervals depending on breeding activity. Single male and paired territories without rodent control are also monitored for breeding activity whenever possible, though their results are not included with that of managed pairs. The location and age of all birds observed and color band combination (explained below), if any, was noted on each visit. Nests were counted as successful if they fledged at least one chick. Nest success rate was calculated by the number of successful nests per the number of active nests. Active nests are nests known to have had eggs laid in them as determined by observations of incubation. Reproductive success (fledglings/managed pair) was measured as the average number of fledglings produced per managed pair. Some nests were abandoned for unknown reasons before eggs were laid. If a nest is abandoned after an egg is laid it is considered to have failed.

To facilitate demographic monitoring, Elepaio are captured with mist-nets and marked with a standard aluminum bird band and a unique combination of three colored plastic bands. This is useful because it allows individual birds to be distinguished through binoculars and provides important information about the demography of the population, such as survival and movement of birds within and between years. It also makes it easier to distinguish birds from neighboring territories, yielding a more accurate population estimate. In most cases, Elepaio vocal recordings were used to lure birds into a mist-net. Each bird was

weighed, measured, inspected for molt, fat, overall health, and then released unharmed at the site of capture within 20 minutes.



**Figure 1.** Oahu Elepaio with a bromeliad mosquito (*Wyeomyia mitchellii*) at Palehua. Prevalence of avian pox in Oahu Elepaio has declined over time, suggesting they are becoming resistant to the deadly virus (2016 OANRP YER).

### ***Rodent Control***

This breeding season OANRP again used a combination of small and large-scale trapping grids containing only Victor® rat snap traps baited with peanut butter. Small-scale grids, deployed throughout the territories of Elepaio pairs at SBW and Moanalua Valley, consisted of 12-15 snap traps tied to trees or rocks to prevent scavengers from removing them. Territories labeled as single or vacant may have also contained snap traps baited throughout the breeding season. These territories once contained an Elepaio pair, but one or both birds have not recently been observed. These territories continue to be baited to help control rodents throughout the management area. Traps were counted as having caught a rodent if hair or tissue was found on the trap. Traps were cleaned with a wire brush after each capture so previous captures were not counted twice. Rodent control was conducted for the duration of the Elepaio nesting season. At Ekahanui, a large-scale rat trapping grid containing over 600 snap traps was deployed in 2011 for management of all Elepaio territories in the management unit. A second large-scale grid containing 192 snap traps was deployed in 2015 at Palehua to ensure rodent protection for all resident pairs. Traps at all four sites were checked and re-baited every two weeks during the breeding season (December – June). Due to Army training at SBW, staff were allowed access only one week each month. Therefore,

frequency of baiting was twice during that week of access to maximize the number of rodent kills. Pono Pacific was contracted to conduct rodent control at each of the four sites: Moanalua, SBW, Ekahanui and Palehua. OANRP conducted the monitoring of birds at each of these MUs.



**Figure 2.** Summer intern, Deann Nishimura Thorton, with a juvenile Elepaio at SBW. The first thing people notice when handling an Elepaio is how weightless they are. The average weight of a bird is just 13 grams, or a little less than 3 nickels.

### 6.1.3 Results

With 89 Elepaio pairs managed during the 2017 breeding season, the OANRP fulfilled the required 75 pairs for species management. The results of management conducted for each area during the 2017 breeding season are compiled below. The results from each area are presented in two ways. First, a map presents a compilation of all the known Elepaio territories within each Elepaio MU. The map denotes all of the territories that were baited. Second, the data is presented in tabular form with the number of territories that had single males or contained pairs. The table also presents the number of paired territories in which rodent control was conducted, the number of active nests observed, total successful and failed nests, how many fledglings were observed, and the ratio of fledglings per pair.

***Schofield Barracks West Range*****Figure 3.** Schofield Barracks West Range Territory Occupancy Status and Rat Control 2017**Table 1.** Schofield Barracks West Range Site Demographic Data

<b>SBW</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>
<b>Singles</b>	9	16	16	17	18	16	15
<b>Pairs</b>	81	66	58	57	60	58	56
<b>Pairs with Rat Control</b>	27	28	26	22	29	28	31
<b>Active Nests<sup>1</sup></b>	19	14	14	16	18	23	34
<b>Successful Active Nests<sup>2</sup></b>	10/19=53%	10/14=71%	8/14=57%	8/16=50%	9/18=50%	16/23=70%	22/34=65%
<b>Unknown Nest Outcome<sup>3</sup></b>	5	2	2	3	0	0	0
<b>Failed Active Nests</b>	5	4	4	5	9	7	12
<b>Family Groups Found<sup>4</sup></b>	8	7	5	8	15	11	11
<b>Fledglings Observed<sup>5</sup></b>	19	21	14	20	28	28	46
<b>Fledglings/Managed Pair<sup>6</sup></b>	0.70	0.75	0.54	0.91	0.97	1	1.48

<sup>1</sup> Nest containing eggs or nestlings.

<sup>2</sup> Percentage of successful active nests observed.

<sup>3</sup> Total number of active nests with unknown outcome (sufficient time gap between visits).

<sup>4</sup> Total number of occurrences where pairs were observed with fledglings in which no nests were found.

<sup>5</sup> Total number of fledglings observed from successful active nests and family groups.

<sup>6</sup> The ratio of fledglings per managed pair.

### Reproductive Results

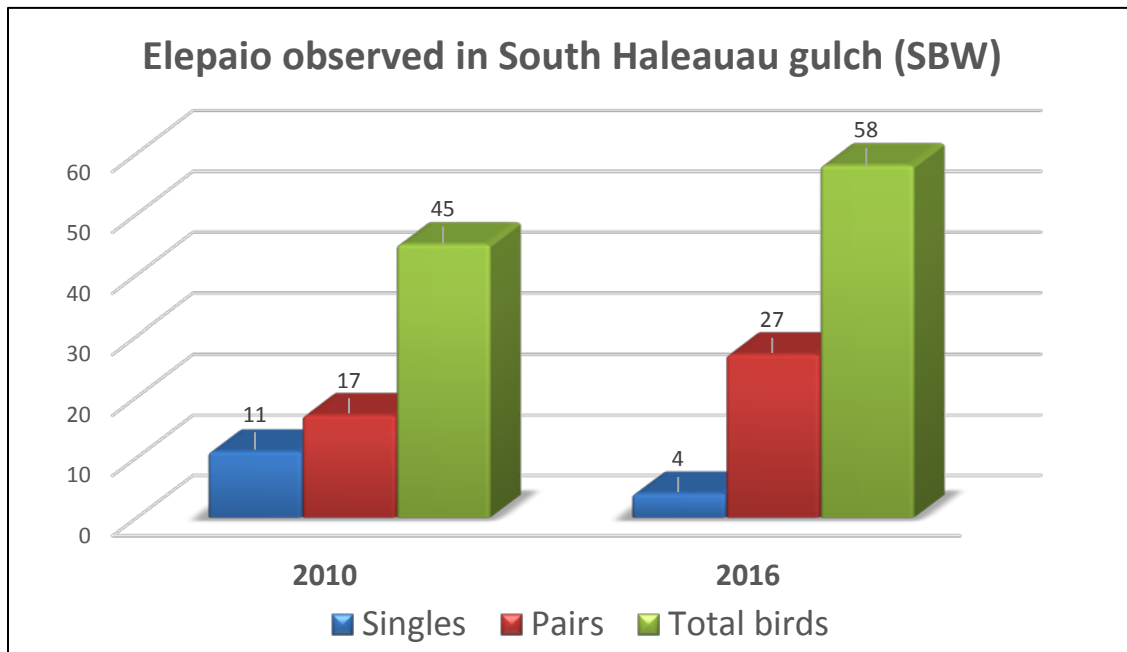
Of the active nests monitored in SBW, 53% (10/19) were successful in producing 11 fledglings, while 26% (5/19) of the active nests failed. Five nests had unknown outcomes (nests with sufficient time gap between visits in which a nest could have fledged with no subsequent detection of a fledgling). Another eight fledglings were found with eight managed pairs where no nesting had been observed (family groups). A total of 19 fledglings were observed in territories benefiting from rodent control management. Another four fledglings were observed in territories not protected from rats.



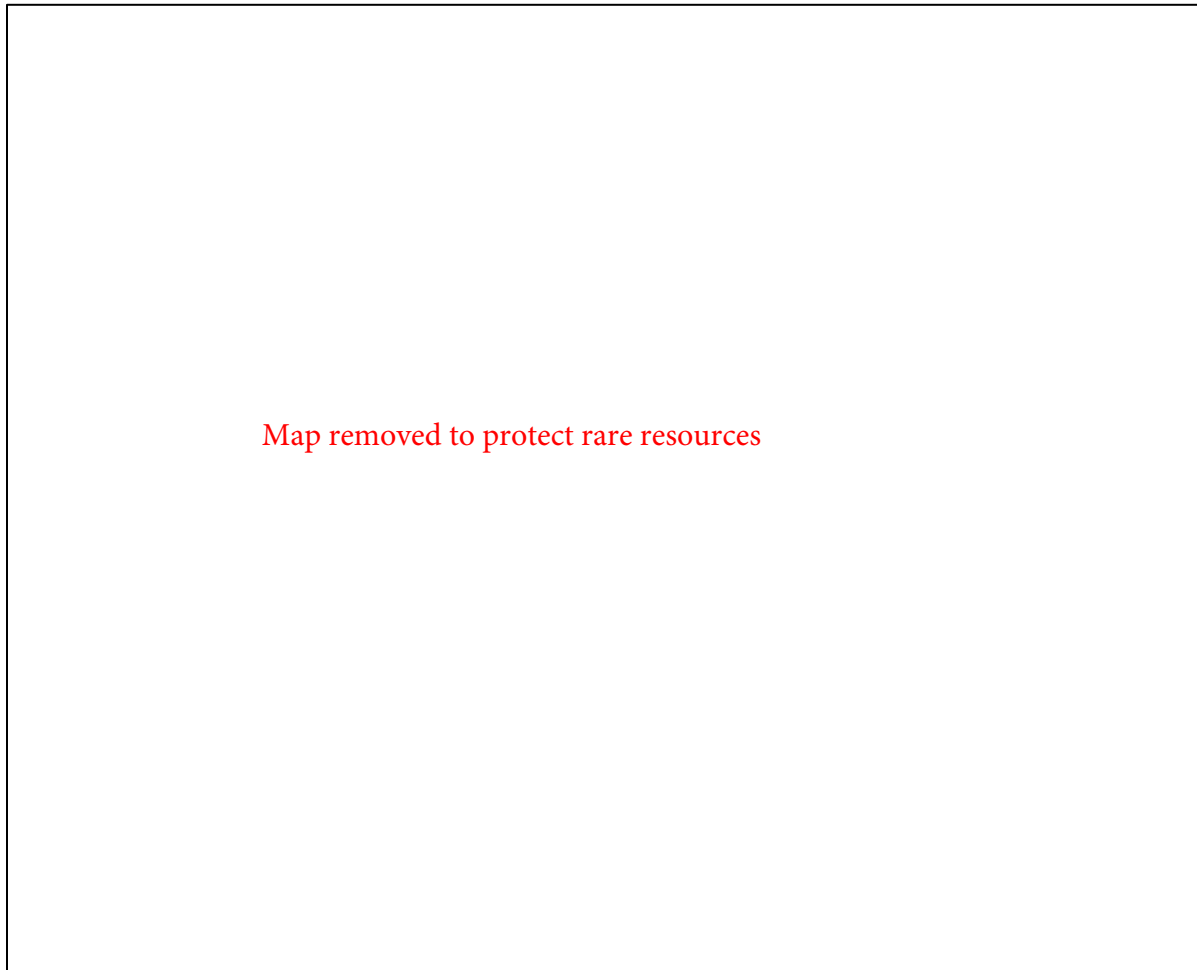
**Figure 4.** Two nestlings contend for a meal from their father. It is common for only one chick to survive this competitive two week “begathon.”

### Summary

Access at SBW remains limited to four or five days per month due to increased training by the Army. This allows for approximately one day per month of access for monitoring to each of the three managed gulches in SBW. This reduces the time available during the breeding season for the OANRP to detect active nests and fledglings. Despite the limited access for monitoring and rebaiting of rat traps, the population continues to increase reaching an impressive 81 pairs in 2017. Largely responsible for this increase is a follow-up survey of the South Haleauau drainage, which is not monitored during the breeding season and was last surveyed in 2010. South Haleauau is the largest drainage inside the management area. It is also the least accessible, which is why there is not regular monitoring or rodent control at Elepaio paired territories. It had been six years since the first detailed survey was conducted and an updated survey was needed to have accurate population data for the entire MU. During the survey in 2010 staff found 17 pairs and 11 single birds. This year staff observed 27 pairs and four single birds, which amounts to a 29% increase in the resident population. Such an increase may be the result of successful breeding within South Haleauau and offspring from the nearby managed drainages immigrating to another gulch with suitable habitat. Without consistent monitoring it is difficult to explain such an increase, but this is very encouraging to see and there are likely more pairs scattered throughout this large drainage in areas we were unable to access.



**Figure 5.** In six years without rodent control, South Haleauau saw a 29% increase in the resident population.

***Honouliuli Forest Reserve – Ekahanui*****Figure 6.** Ekahanui Territory Occupancy Status and Rat Control 2017**Table 2.** Ekahanui Site Demographic Data

<b>EKA</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>
<b>Singles</b>	4	2	0	5	1	11	14
<b>Pairs</b>	42	40	39	30	39	31	30
<b>Pairs with Rat Control</b>	37	37	37	28	36	29	30
<b>Active Nests<sup>1</sup></b>	11	12	23	14	26	21	15
<b>Successful Active Nests<sup>2</sup></b>	6/11=55%	8/12=67%	13/23=56%	7/14=50%	17/26=65%	9/21=43%	8/15=53%
<b>Unknown Nest Outcome<sup>3</sup></b>	0	1	5	3	3	0	1
<b>Failed Active Nests</b>	5	4	6	6	9	12	6
<b>Family Groups Found<sup>4</sup></b>	25	22	6	12	8	6	15
<b>Fledglings Observed<sup>5</sup></b>	36	36	24	21	29	18	26
<b>Fledglings/Managed Pair<sup>6</sup></b>	0.97	0.97	0.65	0.75	0.81	0.62	0.87

<sup>1</sup> Nest containing eggs or nestlings.<sup>2</sup> Percentage of successful active nests observed.<sup>3</sup> Total number of active nests with unknown outcome (time gap between visits).<sup>4</sup> Total number of occurrences where pairs were observed with fledglings in which no nests were found.<sup>5</sup> Total number of fledglings observed from successful active nests and family groups.<sup>6</sup> The ratio of fledglings per managed pair.

### Reproductive Results

Of the active nests monitored, 55% (6/11) were successful, producing eight fledglings, and 45% (5/11) of active nests failed. Twenty-eight fledglings were found in twenty-five managed pairs where no nesting had been observed (family groups). A total of 36 fledglings were observed in territories benefiting from rodent control management. Another three fledglings were observed in territories not protected from rats.

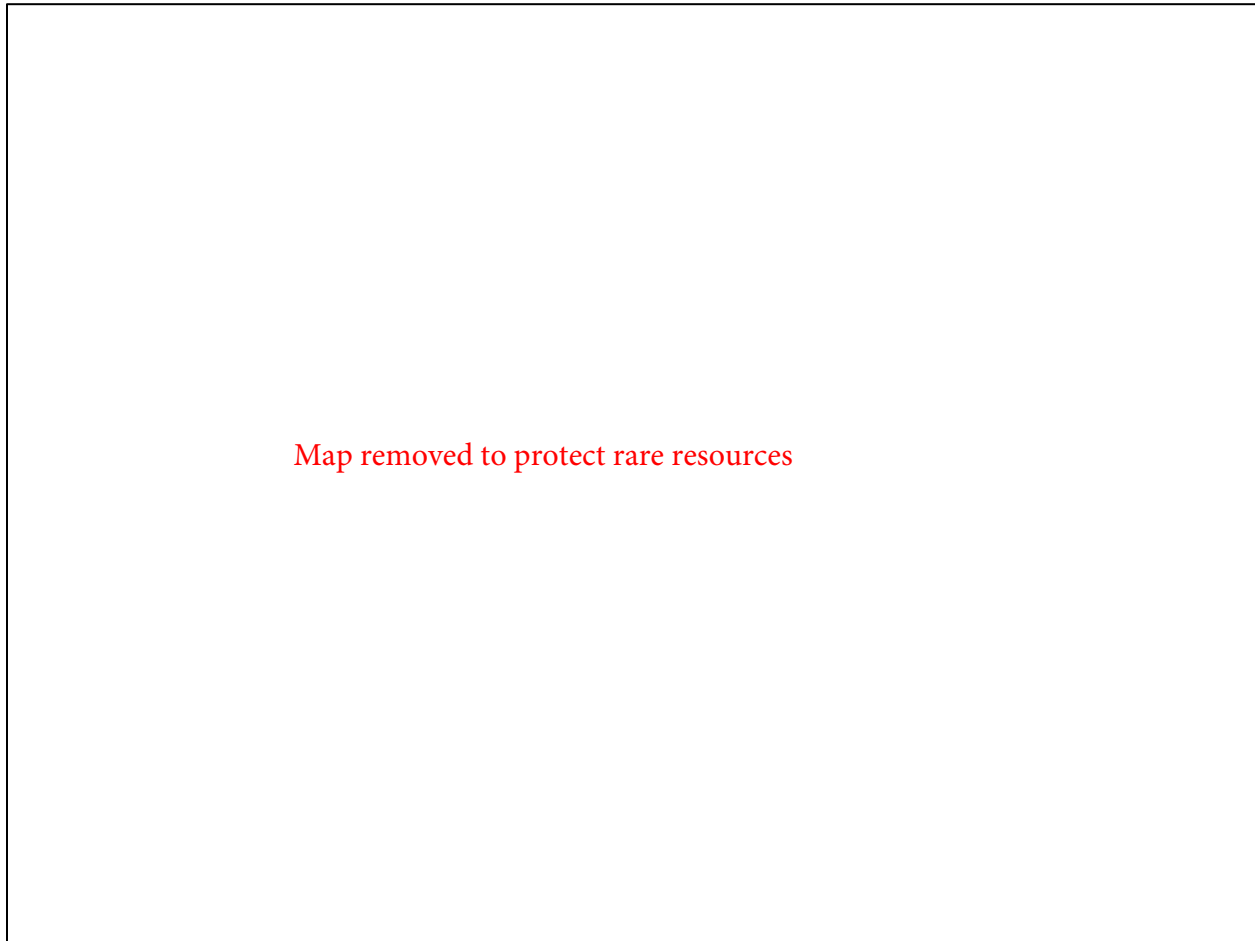
### Summary

The Elepaio had another productive breeding season at Ekahanui with 36 fledglings being detected. This is also the second year in a row that we observed nesting prior to December with 11 fledglings found. Normally when the breeding season is completed in June/July the birds molt and no nesting is observed until December. Any nesting that does occur is considered early nesting. The reason for this early nesting is unknown, but possibly due to favorable weather conditions in September-November. The total population reached an all-time high this year at Ekahanui with 88 birds.



**Figure 7.** The Oahu Elepaio is part of the family of Monarch flycatchers, which includes over 100 worldwide species of insectivorous songbirds. Most are territorial, generally monogamous, decorate small cup-like nests, and, unfortunately, are on the decline.



*Palehua***Figure 8.** Palehua Territory Occupancy Status and Rat Control 2017**Table 3.** Palehua Site Demographic Data

HUA	2017	2016	2015	2014	2013	2012	2011
<b>Singles</b>	5	2	1	2	0	0	0
<b>Pairs</b>	12	11	15	11	17	16	17
<b>Pairs with Rat Control</b>	12	11	15	10	17	16	17
<b>Active Nests<sup>1</sup></b>	6	6	6	8	16	8	13
<b>Successful Active Nests<sup>2</sup></b>	4/6=67%	2/6=33%	3/6=50%	4/8=50%	11/16=69%	3/8=38%	10/13=76%
<b>Unknown Nest Outcome<sup>3</sup></b>	0	0	0	0	0	0	2
<b>Failed Active Nests</b>	2	4	3	4	5	5	1
<b>Family Groups Found<sup>4</sup></b>	5	5	1	4	5	3	5
<b>Fledglings Observed<sup>5</sup></b>	12	8	5	10	21	6	16
<b>Fledglings/Managed Pair<sup>6</sup></b>	1	0.72	0.33	1	1.24	0.38	0.94

<sup>1</sup> Nest containing eggs or nestlings.<sup>2</sup> Percentage of successful active nests observed.<sup>3</sup> Total number of active nests with unknown outcome (time gap between visits).<sup>4</sup> Total number of occurrences where pairs were observed with fledglings in which no nests were found.<sup>5</sup> Total number of fledglings observed from successful active nests and family groups.<sup>6</sup> The ratio of fledglings per managed pair.

### Reproductive Results

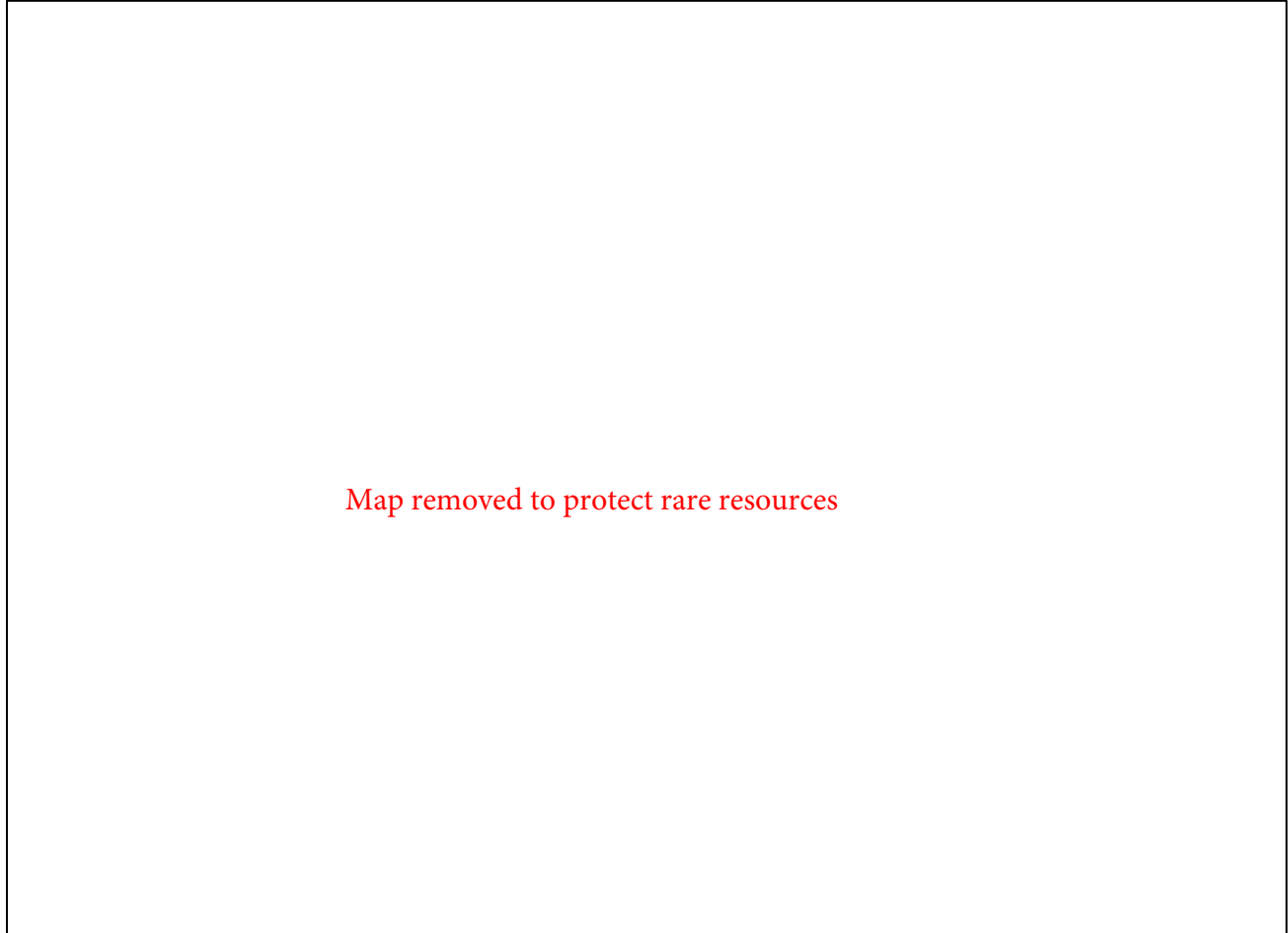
Of the active nests monitored, 67% (4/6) were successful and produced a total of five fledglings, while 33% (2/6) of the nests failed. Seven fledglings were found with five managed pairs where no nesting had been observed (family groups). A total of twelve fledglings were observed in territories benefiting from rodent control management.

### Summary

Our smallest and southernmost Elepaio population in the Waianae mountain range had a fairly good 2017 breeding season. The population grew slightly over last year and there was a significant increase in fledglings found. Again, we saw early nesting for the second consecutive season with three fledglings found in three separate pairs in November 2016. The birds are likely taking advantage of favorable weather conditions in the fall months.



**Figure 9.** Mist-netting and banding juvenile birds before they acquire their adult plumage allows us to accurately track their age from year to year. Currently, the oldest known Elepaio is a male in SBW. He is 22 years old and is the oldest known living Elepaio in the state of Hawaii. He is the 3<sup>rd</sup> oldest Elepaio ever known, with the title going to a bird that lived to be 23 years and 2 months at Hakalau NWR on the Big Island. The only known Hawaiian passerine to live longer than this bird was an Alala, which was 24 years old when it died in captivity.

*Moanalua Valley***Figure 10.** Moanalua Territory Occupancy Status and Rat Control 2017**Table 4.** Moanalua Site Demographic Data

MOA	2017	2016	2015	2014	2013	2012	2011
<b>Singles</b>	7	6	6	7	14	19	10
<b>Pairs</b>	39	34	33	32	33	32	21
<b>Pairs with Rat Control</b>	13	12	19	22	23	24	16
<b>Active Nests<sup>1</sup></b>	9	3	7	16	17	15	13
<b>Successful Active Nests<sup>2</sup></b>	7/9=78%	1/3=33%	3/7=43%	5/16=31%	14/17=82%	10/15=67%	5/13=38%
<b>Unknown Nest Outcome<sup>3</sup></b>	1	2	1	7	6	2	5
<b>Failed Active Nests</b>	1	2	3	6	3	5	3
<b>Family Groups Found<sup>4</sup></b>	1	2	4	4	2	2	3
<b>Fledglings Observed<sup>5</sup></b>	10	3	7	11	17	13	9
<b>Fledglings/Managed Pair<sup>6</sup></b>	0.77	0.25	0.37	0.5	0.74	0.54	0.56

<sup>1</sup> Nest containing eggs or nestlings.<sup>2</sup> Percentage of successful active nests observed.<sup>3</sup> Total number of active nests with unknown outcome (time gap between visits).<sup>4</sup> Total number of occurrences where pairs were observed with fledglings in which no nests were found.<sup>5</sup> Total number of fledglings observed from successful active nests and family groups.<sup>6</sup> The ratio of fledglings per managed pair.

### Reproductive Results

Of the active nests monitored, 78% (7/9) were successful in producing nine fledglings, and 11% (1/9) failed. One nest had an unknown outcome (nests with sufficient time gap between visits in which a nest could have fledged with no subsequent detection of a fledgling). One fledgling was found in one managed pair where no nesting had been observed (family groups). A total of ten fledglings were observed in territories benefiting from rodent control management. Another three fledglings were observed in territories not protected from rats.

### Summary

Moanalua Valley had a much improved breeding season over the last few years. There was a higher number of successful active nests and the total population is the largest ever seen. New Elepaio territories continue to be found lower down in the valley, as well as close to the road allowing for added management protection. Unfortunately, previous managed territories in the back of the valley still remain cut off from monitoring and rodent control due to poor road conditions, but we are hopeful to one day revisit these territories to confirm their current status.



**Figure 11.** With a rapid series of wheezy calls, a fledgling Elepaio begs for food from nearby adults. Not long from now the young bird will have to be fast enough to capture its own live insect prey.

### **6.1.4 OIP Summary**

#### **Management Action Highlights 2017**

- Conducted rodent control in a total of 89 territories with pairs at four management sites.
- Completed a follow-up survey of South Haleauau gulch in SBW to update the original survey that was conducted in 2010.

- Table 5 below summarizes the number of managed pairs and reproductive output since 2006.

**Table 5.** Summary of Elepaio Management

Year	Managed Pairs	Success Active Nests	Family Groups	Fledglings	Fledglings/Managed Pair
2017 <sup>1</sup>	89	26	36	73	0.82
2016 <sup>1</sup>	88	21	36	68	0.77
2015 <sup>1</sup>	97	27	20	50	0.52
2014 <sup>1</sup>	81	24	28	62	0.77
2013 <sup>1</sup>	105	51	38	95	0.90
2012 <sup>1</sup>	97	38	22	65	0.67
2011 <sup>1</sup>	94	47	34	96	1.02
2010 <sup>1</sup>	87	18	15	39	0.45
2009 <sup>2</sup>	81	29	24	60	0.74
2008 <sup>3</sup>	74	25	20	56	0.76
2007 <sup>3</sup>	78	18	26	46	0.59
2006 <sup>4</sup>	69	11	17	33	0.48

<sup>1</sup>SBW, Ekahanui, Moanalua, Palehua

<sup>2</sup>SBW, Ekahanui, Makaha, Moanalua, Palehua

<sup>3</sup>SBW, Ekahanui, Makaha, Moanalua, Waikane, Palehua

<sup>4</sup>SBW, Ekahanui, Makaha, Moanalua

### Management Actions 2018

- Continue to mist-net and band all adult and juvenile Elepaio within the MUs to improve yearly demographic monitoring. In the process, record songs and calls in order to expand our collection of Oahu Elepaio vocalizations at all MUs.
- Conduct surveys within and beyond MUs to monitor bird movements and population growth of the species. This will include conducting the 5<sup>th</sup> survey since 2009 of the two drainages north of the Ekahanui MU. Since that time the Elepaio population north of Ekahanui has increased 303% with the number of breeding pairs increasing from 1 to 14.
- All Victor<sup>®</sup> rat snap traps in both large and small-scale rodent control grids will be replaced with A24 traps with automatic lures. This will hopefully increase rat kills within Elepaio breeding areas and decrease the number of staff hours needed to reset the traps.
- Increase the use of motion sensor cameras to monitor nesting activity at night and document Elepaio nest predation.
- Conduct rodent control and Elepaio monitoring at Ekahanui, SBW, Palehua and Moanalua to meet required 75 managed pairs.

### 6.1.5 Terms and Conditions for Implementation

Minimize direct impacts of military activities on survival and reproduction of Oahu Elepaio within the action area at Schofield Barracks Military Reserve (SBMR).

1. *The Army will report to the Service in writing at least semiannually (twice per year) the number of high explosive rounds that land above the fire break road, the locations where such rounds land, and whether these locations are within any known Elepaio territories.*

[No high explosive rounds landed above the firebreak road]

2. *The Army will notify the Service within 24 hours of any fires that burn any portion of a known Elepaio territory and the number of Elepaio territories affected.*

[No fires affected any known Elepaio territories during the 2017 breeding season]

3. *The Army will limit training actions in the forest above the fire break road at SBMR in the Elepaio nesting season (January to May) to small numbers of troops (platoon or less) that remain in one location for short periods of time (one hour or less), to limit possible nest disturbance.*

[No training actions have occurred above the firebreak road]

4. *The depository designated to receive specimens of any Oahu Elepaio that are killed is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817 (telephone: 808/547-3511). If the B.P. Bishop Museum does not wish to accession the specimens, the permittee should contact the Service's Division of Law Enforcement in Honolulu, Hawaii (telephone: 808/541-2681; fax: 808/541-3062) for instructions on disposition.*

[No specimens were collected by OANRP staff]

Minimize loss of Oahu Elepaio habitat at SBMR, Schofield Barracks East Range (SBER), and Kawaioloa Training Area (KLOA).

1. *The Army will report to the Service in writing on a semi-annual (twice per year) the number of fires above the fire break road, the area burned by each fire above the fire break road, including the amount of critical habitat burned, and how each fire was ignited or crossed the fire break road.*

[No fires occurred above the firebreak road]

2. *The Army will notify the Service within 24 hours of any instance in which training was not conducted in accordance with the Wildland Fire Management Plan (WFMP).*

[All training was conducted in accordance with the WFMP]

Manage threats to Oahu Elepaio and Oahu Elepaio habitat at SBMR, SBER, and KLOA.

1. *The Army will report to the Service in writing annually the number of Elepaio territories in which rats were controlled, the location of each territory in which rats were controlled, the methods by which rats were controlled in each territory, the dates on which rat control activities were conducted in each territory, and the status of Elepaio in each territory from the previous year.*

[This report documents all of the above requirements]

2. *The Army, Service, and ornithological experts will formally reassess all impacts to Oahu Elepaio and Elepaio critical habitat that have occurred during the first five years following completion of this biological opinion. This formal review will occur before the end of calendar year 2008 and its purpose will be to reassess impacts from training exercises and, if necessary, correct any outstanding issues that are still impacting Elepaio and resulting in the loss suitable Elepaio habitat at SBMR. The feasibility of restoring critical habitat areas that have been lost also will be reassessed during this formal review.*

[Completed]



**Figure 12.** Spiders are an important resource for the Elepaio. Not only do the birds use their webs to hold the tightly packed nest together, but they are also a nutritious snack for the nestlings.

## 6.2 MIP ELEPAIO MANAGEMENT 2017

### Background

The initial Biological Opinion (BO) that triggered the development of the Makua Implementation Plan (MIP) was issued in 1999. At that time, the Oahu Elepaio (*Chasiempis ibidis*) was not listed as an

endangered species, but the 1999 BO did include recommendations related to Elepaio. These included conducting complete surveys of the Makua Action Area (AA) for Elepaio presence, monitoring of all known Elepaio within Makua Military Reservation (MMR) and installing and maintaining predator control grids around nesting pairs within MMR. In 2000, the U.S. Fish and Wildlife Service (USFWS) granted the Oahu Elepaio endangered species status under the Federal Endangered Species Act and in 2001 designated critical habitat on Oahu for the Elepaio. In the *Supplement to the Biological Opinion and Conference Opinion for Proposed Critical Habitat for Routine Military Training at Makua Military Reservation* issued in 2001, the recommendations from the 1999 BO became requirements. In September 2004, the USFWS issued another BO that covered newly designated critical habitat within the Makua AA for plants and Elepaio. This BO outlined additional requirements related to this critical habitat. The most recent BO issued in 2007 required the protection of all Elepaio pairs within the Makua AA. A term and condition in this 2007 BO was to construct ungulate-proof fencing around Makua Military Reservation and control rodents using aerially broadcast rodenticide when authorized.

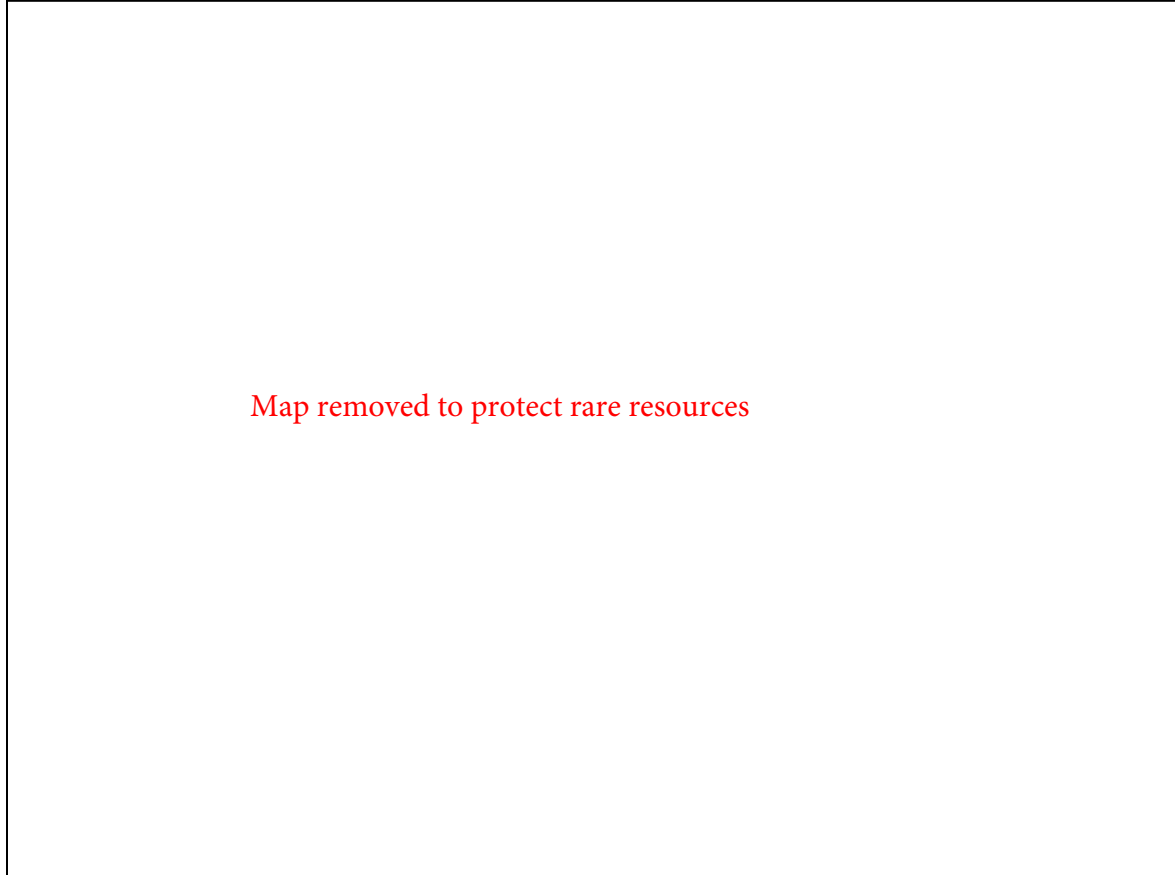
### Methods/Results

The methods section and the presentation of the results are in the same format as in the OIP Elepaio management section of this year-end report.



**Figure 13.** Small Vertebrate Specialist, Tyler Bogardus, with a juvenile Elepaio. Younger birds are easier to capture than adults due to their aggressiveness as they search for a territory and a mate.



***Makua*****Figure 14.** Makua Territory Occupancy Status and Rat Control 2017**Table 6.** Makua Site Demographic Data

<b>Makua</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>
<b>Single Males</b>	2	2	N/A	0	2	2	2	2	1	1	2	4
<b>Single Females</b>	0	0	N/A	0	0	0	0	0	0	1	1	1
<b>Pairs</b>	0	0	N/A	0	0	0	0	0	2	2	2	1
<b>Pairs with Rat Control</b>	0	0	N/A	0	0	0	0	0	2	2	2	1
<b>Active Nests<sup>1</sup></b>	0	0	N/A	0	0	0	0	0	1	1	0	0
<b>Successful Active Nests<sup>2</sup></b>	0	0	N/A	0	0	0	0	0	0	0	0	0
<b>Unknown Active Nests<sup>3</sup></b>	0	0	N/A	0	0	0	0	0	1	0	0	0
<b>Failed Active Nests</b>	0	0	N/A	0	0	0	0	0	0	1	0	0
<b>Family Groups Found<sup>4</sup></b>	0	0	N/A	0	0	0	0	0	0	0	0	0
<b>Fledglings Found<sup>5</sup></b>	0	0	N/A	0	0	0	0	0	0	0	0	0
<b>Fledglings/Pair<sup>6</sup></b>	0	0	N/A	0	0	0	0	0	0	0	0	0

<sup>1</sup> Nest containing eggs or nestlings.<sup>2</sup> Total number of successful active nests observed.<sup>3</sup> Total number of active nests with unknown outcome (time gap between visits).<sup>4</sup> Total number of occurrences where pairs were observed with fledglings in which no nests were found.<sup>5</sup> Total number of fledglings observed from successful active nests and family groups.<sup>6</sup> The ratio of fledglings per managed pair.

### Reproductive Results

In 2017, two surveys of the valley were conducted in February and August. Previous occupied territories and other areas containing suitable breeding habitat were surveyed with the help of digital recordings of Elepaio songs and calls specific to Makua Valley. During each 3-day camping trip two adult males were found, both defending separate territories in gulches deep within the valley. A breeding pair of Elepaio has not been observed in Makua Valley since 2009.

### **MIP Summary**

#### **Management Actions 2017**

- There were no Elepaio territories monitored for breeding activity in Makua Valley.

#### **Management Actions 2018**

- Conduct yearly territory occupancy surveys at all territories and surrounding gulches within the Makua AA, monitoring and banding, and data entry and organization.



**Figure 15.** The sun sets over Makua Valley, now home to just two male Elepaio.

## **6.3 OPEAPEA MANAGEMENT 2017**

### **6.3.1 Background**

OANRP originally conducted acoustic monitoring for the Hawaiian Hoary bat (*Lasiurus cinereus semotus*) or Opeapea from 2010 to 2013 on all Oahu Army Training Areas: Dillingham Military Reservation (DMR), Kahuku Training Area (KTA), Kawaihoa Training Area (KLOA), Makua Military Reservation (MMR) and Schofield Barracks Military Reservation (SBMR). These surveys were conducted for over 301 nights in order to establish bat presence or absence and if possible document potential seasonal use of habitats by the Opeapea. OANRP found Opeapea present at all Oahu Training Areas (Fig. 13) but seasonality of habitat use could not be determined. Specific foraging behavior was documented from KTA, DMR and Schofield Barracks West Range (SBW). In general, bat detections on Oahu are much lower than from data collected on Hawaii, Maui and Kauai islands (C. Pinzari pers. comm.).

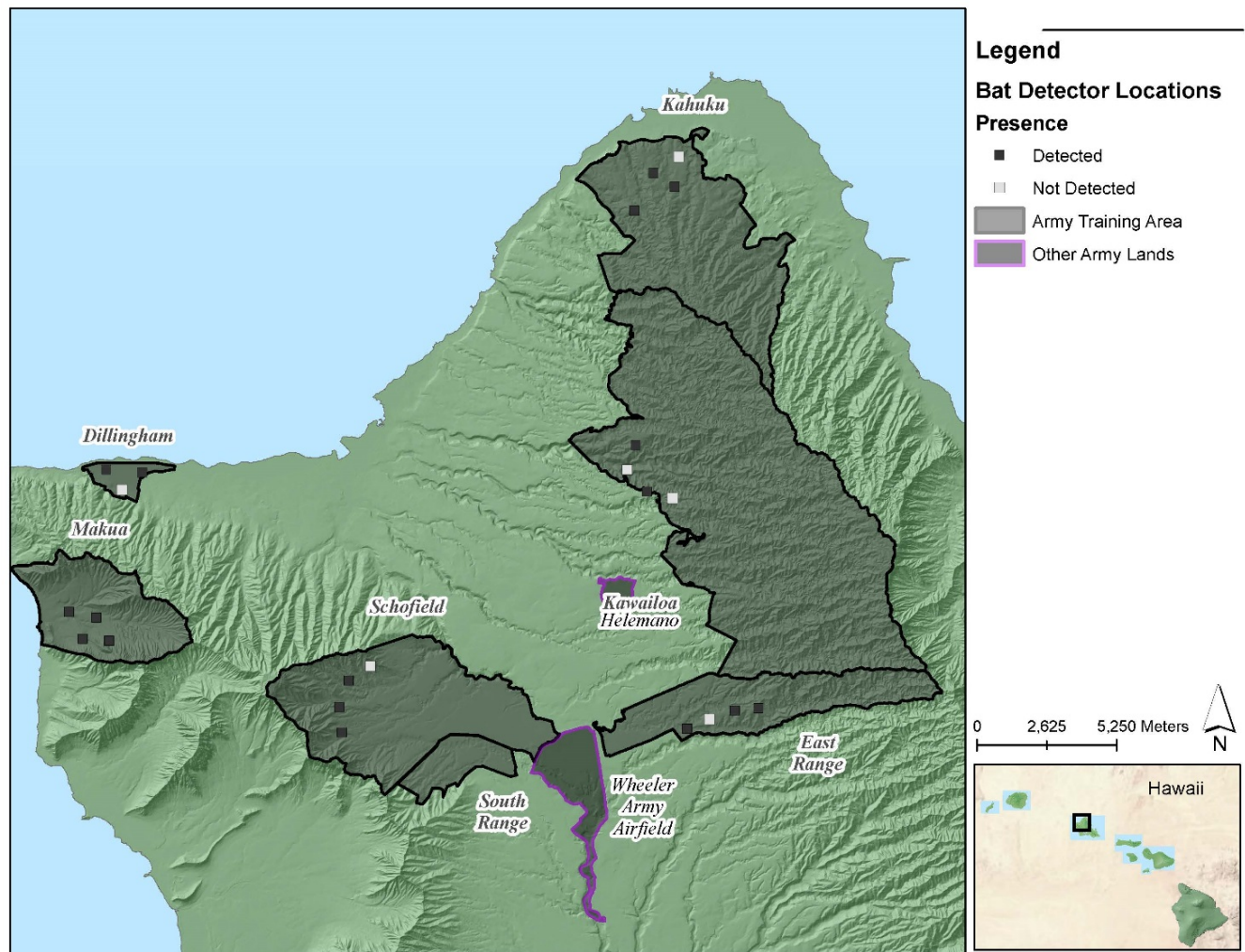
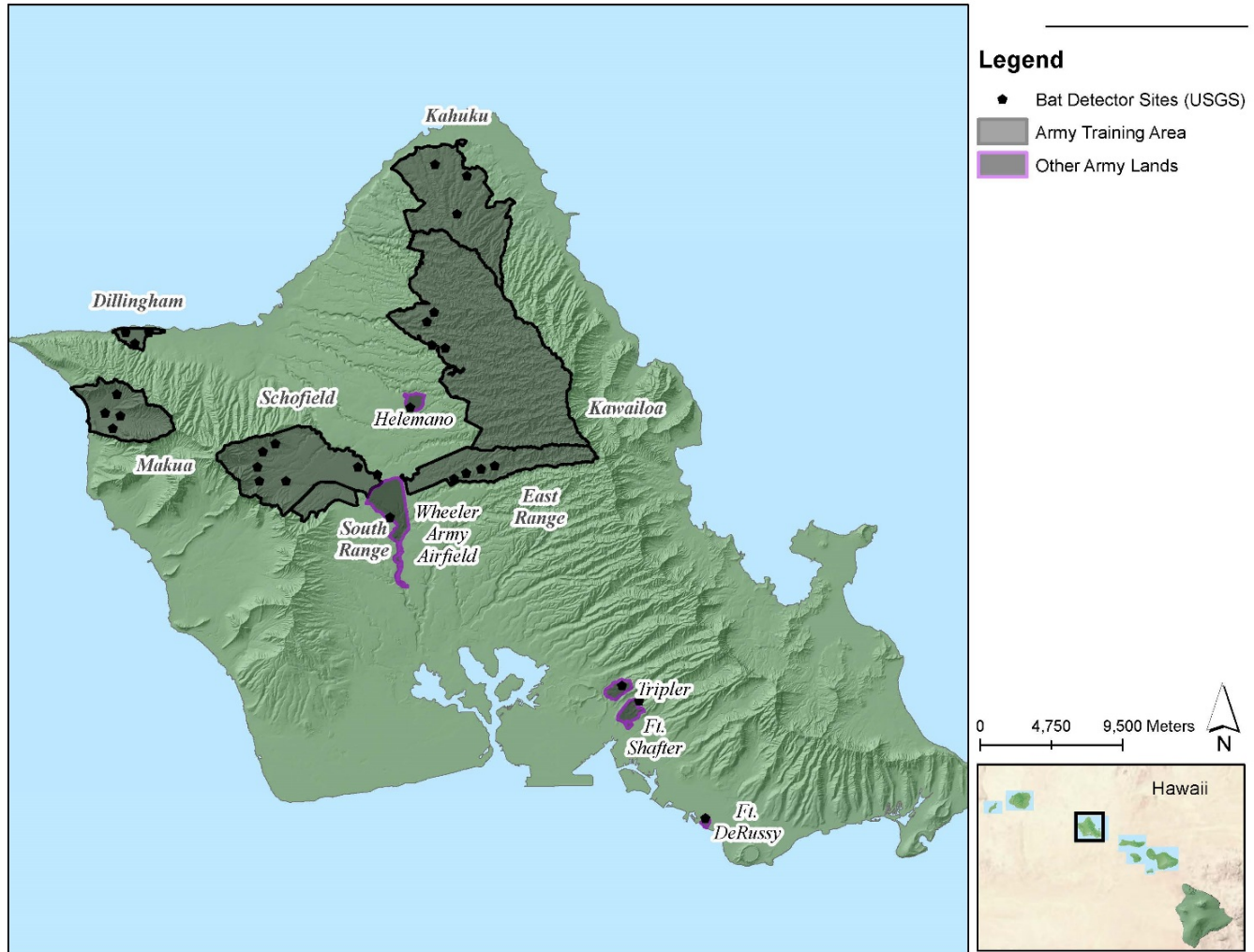


Figure 16. OANRP bat survey sites on Army Training lands.

### 6.3.2 Opeapea Management Summary

OANRP secured funding in FY 15 to conduct more intensive acoustic monitoring surveys across a majority of the Army installations on Oahu, including cantonment areas. The survey period was originally from January 2015 to January 2016 but due to range scheduling conflicts the recorders were left out until March 2016. Figure 14 displays all of the locations that the bat acoustic recorders were placed throughout the duration of the study. A total of 30 monitoring stations were run nightly for this study. Final results are forthcoming in calendar year 2018 as a Hawaii Cooperative Studies Unit Technical Report. Preliminary results from the study are, 20 out of the 30 sites had bat presence, but the detection rates were very low (Figure 13). The highest detection rates were at a station in Dillingham Airfield (0.05) and at the stations spread across the West Range (0.04 up to 0.355). All other stations had much lower detectabilities, most around 0.01 and below. Foraging activity was recorded across West Range and one station at East Range (C. Pinzari pers. comm.). This report will be used in the upcoming consultation with the USFWS.



**Figure 17.** USGS survey sites for Opeapea on Army controlled lands.

OANRP continues to abide by the restrictions provided by the USFWS to minimize impacts to bats through an informal consultation. Refer to the 2016 OANRP YER for further details on the restrictions. During the 2017 pupping season, permission was given to remove trees that were safety hazards or necessary for ongoing construction projects. In each case, OANRP employed a combination of acoustic monitoring (Echo meter Touch or SM2 Bat Songmeter) and thermal imager (Fluke 400T) surveys to determine if bats were utilizing the trees for roosting and if pups were present. OANRP also recorded whether any other wildlife was observed during the surveys. Results of all the surveys are listed in Appendix 6-1 to 6-7. Table 7 shows that a total of eight surveys were conducted by OANRP before the end of this reporting period. All totaled, ~16 hours were spent conducting these surveys (not including transportation time) in 83 trees (six different species). Zero roosting or flying bats were detected during the course of the thermal surveys but a preliminary acoustic survey for the 19 July survey did detect bats flying through the site three times in two nights (Appendix 6-2).

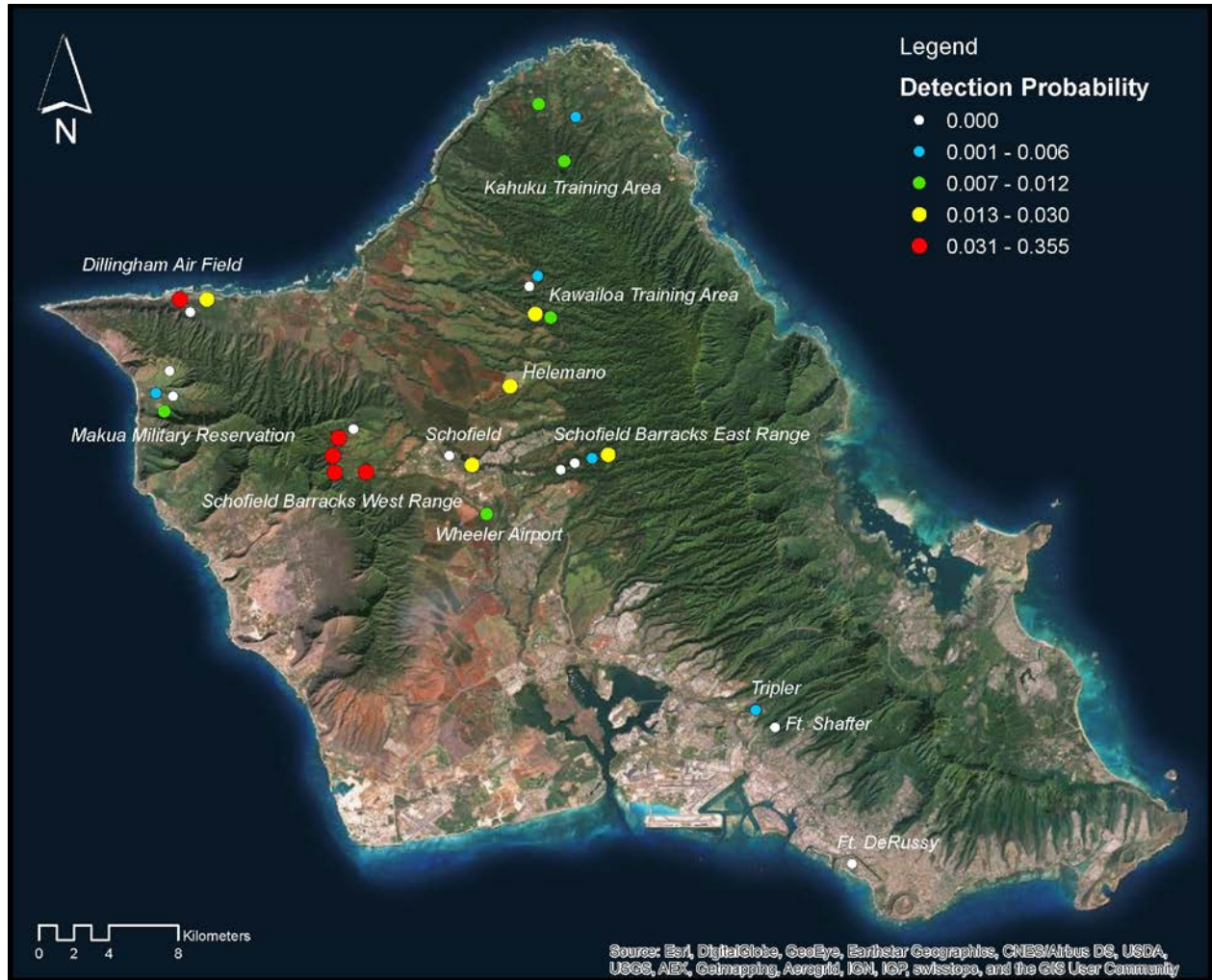


Figure 18. Draft map of the general results from USGS study

Table 7. 2017 Opeapea Acoustic/Thermal Surveys, showing number of trees by species surveyed

SURVEY DATE	2017-06-05	2017-07-19	2017-07-20	2017-07-21	2017-07-24	2017-07-26	2017-08-03	2017-08-24
INSPECTOR	M. Burt	M. Burt	M. Burt P. Smith	P. Smith	M. Burt	P. Smith	P. Smith	K. Kawelo J. Rohrer T. Bogardus
THERMAL OR ACOUSTIC SURVEY	Both	Both	Both	Both	Thermal	Both	Both	Both
START TIME	05:00	5:00	4:40	4:40	05:00	06:00	05:30	05:30
END TIME	06:30	6:30	6:30	7:30	06:30	07:20	06:30	06:30
TOTAL TIME	1.5 Hr	1.5 Hr	1.8 Hr	2.8 Hr	1.5 Hrs	1.20 Hrs	1 Hr	1 Hr
BAT DETECTED (T/A)	No	No/Yes	No	No	No	No	No	No
WILDLIFE DETECTED	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WEATHER	Clear, Light wind	Clear, Light wind	Clear, Light wind	Clear, Light wind	Rainy	Clear, light wind	Clear, light wind	Rain, Drizzling
ARMY INSTALLATION	SBMR	SBMR	SBMR	SBMR WAAF	SBMR	SBMR	TAMC	SBMR
AFRICAN TULIP					6	2		
EUCALYPTUS SPP.				4	7	10		5
MONKEY POD			5	2	1			
ALBIZIA SPP.	3	25			1		3	
KUKUI						1		
IRONWOOD						8		
HOURS SUBTOTAL	1.5	1.5	3.6	2.8	1.5	1.2	1.0	3.0
<b>TOTAL HOURS</b>								<b>16.1</b>