

## The beginning of Black-footed Albatross colonization on O'ahu, Hawai'i

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**ABSTRACT.** The Black-footed Albatross (*Phoebastria nigripes*; BFAL) breeds primarily in the low-lying Northwestern Hawaiian Islands where it is vulnerable to the effects of sea level rise. Establishing additional colonies on high islands is one of the most important conservation actions for this species. We documented BFAL sightings on O'ahu from 2003-2015 and describe initial efforts to use social attraction to create a new colony at Ka'ena Point Natural Area Reserve. We made observations of BFAL at Ka'ena Point during weekly visits to monitor nesting Laysan Albatrosses (*P. immutabilis*) from November-June in 2003-2015 and we used remote trail cameras starting in 2010 to supplement observations. Social attraction of BFAL consisted of three decoys placed in 2011 and a solar-powered sound system broadcasting BFAL courtship calls in 2015. Thirty-four BFAL observations occurred at Ka'ena Point from 2006-2015 and the number of observations increased over time. Sixteen individuals spent time on the ground and 18 were seen flying over land. Twenty-seven of 34 observations (79%) occurred after social attraction was initiated and 11 observations occurred during 2015, the year vocalizations first were broadcast. We banded two birds (one male in 2012 and one female in 2014). All but two observations were of single birds. Although visitation appears to have increased following social attraction, BFAL have yet to begin breeding at Ka'ena Point. More direct actions, such as translocation of chicks, may be needed to initiate new colony formation in the main Hawaiian Islands.

### INTRODUCTION

The Black-footed Albatross (*Phoebastria nigripes*; BFAL) is a long-lived, highly philopatric seabird with a broad at-sea distribution spanning tropical, subtropical, and subarctic zones (20° to 53°N) of the Pacific Ocean from the west coast of North America to Japan (Hyrenbach et al. 2002 & 2006, Fischer et al. 2009, Kappes et al. 2010). The annual breeding population of BFAL is estimated to be about 60,000 pairs, of which greater than 98% nest on the low-lying atolls in the remote Northwestern Hawaiian Islands (Awkerman et al. 2008, Arata et al. 2009). Small numbers (<100) also nest in the main Hawaiian Islands on Ni'ihau and its offshore islet, Lehua (~30-50 pairs; VanderWerf et al. 2007), and on several islands near Japan (~2,500 pairs; USFWS 2005, Arata et al. 2009). The population trend is thought to be stable overall, but is difficult to determine due to variability in breeding frequency and consequent fluctuations in number of breeders (Arata et al. 2009). BFAL currently are considered



**Figure 1.** Black-footed Albatross social attraction equipment at Ka'ena Point, O'ahu, consisting of three decoys and a solar-powered sound system that broadcast courtship calls.

near-threatened by the International Union for the Conservation of Nature (BirdLife International 2014), but their status has been downgraded during the last several years from endangered to vulnerable to near threatened due to recalculated rates of by-catch.

Black-footed Albatrosses face several serious and immediate threats, including mortality from fisheries by-catch, chick mortality from ingestion of plastics, environmental contaminants, and the invasive alien plant *Verbesina encelioides*, but perhaps the greatest long-term threat to the species is inundation of nesting colonies in the Northwestern Hawaiian Islands caused by sea level rise and increases in storm-surge associated with global climate change (Gilman and Freifeld 2002, Finkelstein et al. 2006, Arata et al. 2009, Awkerman et al. 2008, Lebreton and Véran 2012, VanderWerf 2013). Climate change models indicate that even a modest 2-meter increase in sea level would result in loss of 25% of the land area in the NWHI (Baker et al. 2006, Hatfield et al. 2012, Reynolds et al. 2012). Furthermore, BFAL nest primarily in sandy habitat on the periphery of these low-lying atolls (Awkerman et al. 2008), so they would lose an even larger proportion of their current nesting habitat than other species that nest in the interior of these islands.

Therefore, an effective conservation action for BFAL would be creation of more breeding colonies on high islands that are safe from both inundation and predators (VanderWerf 2013). There currently are only two BFAL colonies in the main Hawaiian Islands, on Ni'ihau and its offshore islet, Lehua. Both

colonies are small and impacted by introduced predators, which affect reproduction and perhaps limit population growth (VanderWerf et al. 2007). Populations on high islands will become increasingly important because they will be better able to withstand predicted rises in sea level (Baker et al. 2006, Hatfield et al. 2012, Reynolds et al. 2012; Reynolds et al. 2015). Herein we report on the status of the Black-footed Albatross on O‘ahu and present results from preliminary attempts to use social attraction to create a new nesting colony.

## METHODS

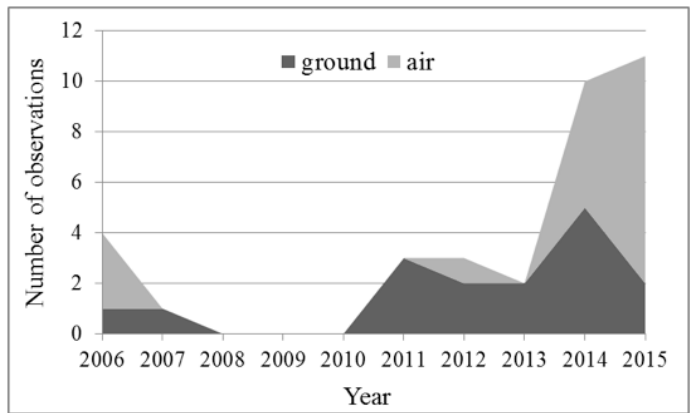
**Monitoring.** We made opportunistic observations of BFAL during monitoring of Laysan Albatross (*P. immutabilis*) colonies at two locations on O‘ahu: Ka‘ena Point Natural Area Reserve and Kuaokala Game Management Area. Ka‘ena Point is the westernmost tip of O‘ahu (21° 58’ N, 158° 27’ W) and the reserve protects 12 ha of arid coastal habitat ranging in elevation from sea level to 25 m. A predator-proof fence was constructed at Ka‘ena Point in 2011 to protect nesting seabirds and other natural resources (Young et al. 2013). Kuaokala is located 6 km east of Ka‘ena Point at 350 m elevation in the northern Waianae Mountains (21° 56’ N, 158° 23’ W) and is the highest LAAL colony in the world. We visited Ka‘ena Point approximately weekly from mid-November through mid-May starting in 2003. We visited Kuaokala less often, approximately once per month, also starting in 2003. We also collected BFAL observations reported by managers and visitors at Ka‘ena Point.

To augment our observations, starting in 2010 we deployed remote cameras with infrared motion-sensitive triggers at both sites, with four cameras at Ka‘ena Point and three at Kuaokala. We placed cameras in areas of high albatross activity, particularly where young, pre-breeding birds gathered to engage in courtship. Starting in 2012, we attempted to capture and band any BFAL we observed on the ground with both a metal band and a plastic color band for identification purposes. We collected a feather sample from each bird at the time of banding to genetically determine gender using protocols outlined in Fridolfsson and Ellegren (1999). We compiled all known BFAL sightings each year from field observations and trail camera photos and we classified these according to whether birds were flying or on the ground.

**Social Attraction.** To attract BFAL to Ka‘ena Point and encourage nesting, we placed three life-sized BFAL decoys in the center of the Laysan Albatross colony in December 2011 (Figure 1). We relocated one of the four trail cameras to record activity at the decoys. One of the decoys was in a sitting position and the other two were in a “sky-moo” position, a part of the courtship display in which a loud mooing call is given while the bill is pointed skyward. To enhance the social attraction program, we added a solar-powered sound system broadcasting BFAL courtship vocalizations next to the decoys in 2015. We tested whether the number of observations has increased over time using a regression analysis, with number of observations per year as the response variable and year as the predictor.

## RESULTS

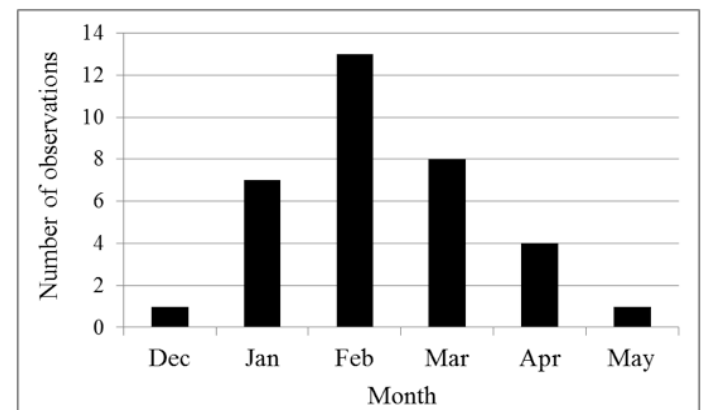
A total of 34 Black-footed Albatross observations have occurred at Ka‘ena Point since 2003, and the number of



**Figure 2.** Number of Black-footed Albatrosses observed in the air and on the ground at Ka‘ena Point from 2006-2015. Decoys were deployed in December 2011 and a sound system was added in 2015.

observations has increased over time (Figure 2;  $F_{1,8} = 6.81$ ,  $p = 0.03$ ,  $R^2 = 39\%$ ). Twenty-seven of the 34 observations occurred after the implementation of social attraction, and 11 observations occurred in 2015, the year vocalizations were first broadcast. Three of the observations were documented with trail cameras and 31 observations were made in person. No BFAL were seen at Kuaokala during the study period.

The observations occurred from December-May, with a peak in February (Figure 3). Sixteen of the birds spent time on the ground and 18 were seen only in the air flying over the reserve. The first observation, in February 2006, was a group of four birds, one of which landed. Similarly, in February 2014 a group of three birds was observed flying together and one bird landed. All other observations were of single birds, and because most birds were not banded it is unknown whether the observations involved different individuals or multiple observations of the same individual. We captured and banded single birds in 2012 and 2014. Genetic analyses revealed that one was a female and the other was a male. Those two birds have not been observed at the colony at the same time, but one of the banded birds was seen again on the ground after banding indicating that at least two observations were of the same individual. Birds that landed often



**Figure 3.** Monthly distribution of Black-footed Albatross observations at Ka‘ena Point, O‘ahu from 2003-2015.



**Figure 4.** Black-footed Albatross associating with Laysan Albatrosses at Ka'ena Point, 3 February 2006 (left photo) and 23 February 2011 (right photo).

associated with Laysan Albatrosses and sometimes appeared to watch their courtship activities (Figure 4). Several of the birds were observed flying low over the decoys and one was observed on the ground near the decoys (Figure 5). No birds were observed attempting to court with the decoys, but in 2012 one of the decoys had scratches on its back, perhaps indicative of an attempted copulation.

## DISCUSSION

Management efforts undertaken at Ka'ena Point to improve seabird habitat and attract BFAL are encouraging first steps towards establishing a new, protected high-island colony for this species. Visitation by BFAL appears to have increased since the deployment of social attraction techniques. However, even with social attraction, visits by BFAL have increased slowly and have consisted primarily of single birds. After 10 years of birds prospecting and four years of attempted social attraction, no BFAL have attempted to nest. As habitat is lost at the main leeward island colonies and individuals are displaced from suitable nesting habitat, it seems possible that BFAL could colonize Ka'ena Point eventually, but that may not occur for several years, if not decades.

Given the high risk to this species from sea level rise (Reynolds et al. 2015), more intensive efforts to initiate colonization on high islands may be needed. Another method often used to create new breeding colonies of seabirds, particularly Procellariiformes like albatross, is to translocate chicks (Deguchi et al. 2012, Jacobs et al. 2013). If chicks are moved to a new location before a critical age at which they imprint on their surroundings, they likely will return as adults to breed at the location where they were raised, instead of the location where they hatched. This technique currently is being used to create a new Laysan Albatross colony at James Campbell National Wildlife Refuge and has been used successfully for both BFAL and Short-tailed Albatrosses (*P. albatrus*) in Japan (Deguchi et al. 2012). Translocating chicks requires feeding them until they fledge and is thus labor intensive, but it results in the production of young that have a high probability of returning to the desired location in just a few years. Demographic models presented by Courtot et al.

(2014) indicate that translocating 100 BFAL chicks could result in a colony of 1,000 breeding pairs within 40 years. These projections are based on recruitment of locally produced chicks and do not factor in any additional immigration, thus the actual colony size produced could be higher if the translocated birds serve as social attraction to immigrating birds. The fastest



**Figure 5.** Black-footed Albatross near decoys at Ka'ena Point, 15 January 2014.

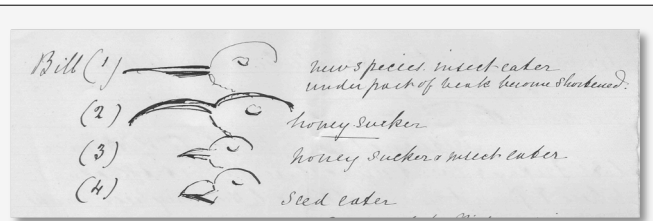
way to establish new BFAL colonies in the main Hawaiian Islands and to facilitate their growth is to expand on existing social attraction efforts and couple them with targeted translocations to suitable, protected sites, such as James Campbell National Wildlife Refuge and Ka'ena Point Natural Area Reserve.

## ACKNOWLEDGMENTS

We thank the Hawai'i Division of Forestry and Wildlife and Natural Area Reserves System for their management efforts and permission to work at Ka'ena Point and Kuaokala. We thank Kimo Lyman, Leslie Macpherson, David Anderson, and Bungo Nishizawa for sharing their observations of Black-footed Albatross, and three reviewers for comments that helped to improve this manuscript. Our seabird monitoring at Ka'ena Point was funded by the David and Lucile Packard Foundation.

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### Errata Scott Barchard Wilson 'Elepaio Vol 75, No. 6

Page 41, column 2, correct James E.F. Harting to James E. Harting. Retract Galapagos, retract James Britten of the British Museum of Natural History

Page 44, column 1, correct J. Sanford Barnes to Leonard C. Sanford

## Upcoming Field Trips, Volunteer Opportunities & Events

Please RSVP with name and contact information to  
Hawai'i Audubon Society at 808-528-1432 or [hiaudsoc@pixi.com](mailto:hiaudsoc@pixi.com) unless otherwise specified

### 116<sup>th</sup> Annual Christmas Bird Count December 14<sup>th</sup> 2015 – January 5<sup>th</sup> 2016

Take advantage of this citizen science opportunity and participate in your local bird count! Counts will be held throughout the islands during this period. Please see our website or contact the office with any questions. Further details of the count:

<http://www.audubon.org/conservation/science/christmas-bird-count>

### Tour of James Campbell NWR January 16<sup>th</sup> 2016 | 3:00 – 5:00 pm | Kahuku

Guide: Richard (Dick) May

Tour size limited to 20 members.

*HAS Members have first preference for this program.*

Participants will see Hawaiian Duck, Hawaiian Stilt, the Hawaiian race of the Common Gallinule, Hawaiian Coot, Black-crowned Night-Heron and Bristle-thighed Curlew. We should see Ruddy Turnstone, Sanderling, and Wandering Tattler. Other shorebirds and waterfowl are possible, plus we will have a good discussion about the work needed to maintain this precious place.

**Please RSVP by JAN 9th** to attend to [hiaudsoc@pixi.com](mailto:hiaudsoc@pixi.com), subject line: James Campbell Tour.

### Volunteer Days at Freeman Seabird Preserve Every Saturday | January - March 2016

Leader: Wendy Johnson

First Workday: 2 January 2016

Volunteers are needed for restoration fieldwork, including maintenance of native plants and man-made landscape features, along with removal of invasive plants, trash and debris. Please RSVP to attend to [hiaudsoc@pixi.com](mailto:hiaudsoc@pixi.com), subject line: Freeman Volunteer.



### Kawainui Marsh Waterbird Habitat Restoration Saturday, February 6<sup>th</sup>, 2016 | 9:00 am – noon

Volunteer at the monthly Kawainui Volunteer Day led by DLNR/DOFAW. HAS has adopted ponds #10 and #11. Support some of Hawaii's most endangered waterbirds and contribute to the success of the new restoration ponds behind Castle Medical Center in Kailua (at the end of Ulukahiki Street).  
*NOTE: January 2<sup>nd</sup> program has been cancelled.*

## Wisdom the 64-year old Laysan albatross is sighted on Midway Atoll National Wildlife Refuge

*The world's oldest known seabird returns and finds her mate.*

U.S. Fish & Wildlife Service News Release  
November 26, 2015

Contact: Bret Wolfe 808-954-4817 Email: [Bret\\_Wolfe@fws.gov](mailto:Bret_Wolfe@fws.gov)



U.S. Fish and Wildlife Service officials are pleased to announce that the world's oldest known banded bird in the wild, a Laysan albatross named Wisdom, was sighted on November 19 on Midway Atoll National Wildlife Refuge within Papahānaumokuākea Marine National Monument. Just in time for Thanksgiving, Wisdom was spotted with her mate amongst the world's largest nesting albatross colony.

Wisdom was first banded in 1956. And because Laysan albatross do not return to breed until they are at least five years old, it is estimated Wisdom is at least 64 years old, but she could be older. Many birds lose their bands before they can be replaced. Wisdom's bands, however, were continuously replaced and because of meticulous record keeping associated with bird banding, we can verify she is the same bird first banded by noted author and Service ornithologist, Chandler Robbins. Biologists may find even older birds as old worn bands continue to be routinely replaced.

## Wisdom, continued...

Although Laysan albatrosses typically mate for life, Wisdom has likely had more than one mate and has raised as many as 36 chicks. Laying only one egg per year, a breeding albatross and their mate will spend approximately six months rearing and feeding their young. When not tending to their chicks, albatross forage hundreds of miles out at sea periodically returning with meals of squid or flying fish eggs. Wisdom has likely clocked over six million ocean miles of flight time.

- Video and images of previous nesting and egg laying go to: <http://bit.ly/1PPwJ6U>
- NEW Nov. 28 and Dec 1, 2015 Video Available at: <http://bit.ly/1141YOV>

## Hawaiian Wetlands and Waterbird Workshop

- January 26-28, 2016
- Ko'olau Conference Center, Kāne'ohe, O'ahu

The first two days will include a mix of topic areas: new science and planning, site restoration and management, and cultural connections. The third day will move outside for wetland site visits.

### Register at:

<https://www.eventbrite.com/e/hawaiian-wetlands-and-waterbird-workshop-registration-19566901128>

### Sponsored by:

- [Pacific Birds Habitat Joint Venture](#)
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## Kure Atoll Volunteer Opportunity

The Division of Forestry and Wildlife is recruiting volunteers for Kure Atoll in 2016. Kure provides habitat for 18 seabird species and approximately 3,500 breeding pairs of ka'upu (black-footed albatrosses in addition to many more wildlife treasures, including endangered 'ilioholoikauaua (Hawaiian monk seals). Volunteer positions are for 7 months. For inquiries, please email Matt Saunter or Naomi Worcester at [kureatoll@gmail.com](mailto:kureatoll@gmail.com).

'Elepaio ISN 0013-6069

Scientific Editor: Glenn Metzler

Managing Editor: Jody Smith

*The 'Elepaio is printed on recycled paper and published six times per year.*

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## Videos from the 23rd Annual Hawai'i Conservation Conference (HCC)

August 3-6, 2015, University of Hawai'i at Hilo, Hawai'i  
*A selection of 15-minute presentations about Hawaiian Birds recorded at the 2015 Conference*



### Rodent Trapping to Protect Kauai's Forest Birds

<https://vimeo.com/142550924>

### Is it Possible to Reduce Rat Predation of Endangered Seabirds on Kaua'i Using Available Control Methods?

<https://vimeo.com/142550995>

### Using Automatic Rat Traps for Management Unit Wide Ecosystem Benefit

<https://vimeo.com/142549849>

### Planning for Kiwikuu Reintroduction: Habitat Restoration in Nakula Natural Area Reserve, Maui

<https://vimeo.com/141102753>

### Movement Patterns of Adult and Juvenile 'Akohekohe (*Palmeria dolei*)

<https://vimeo.com/139636538>

### Distributional Patterns in 'I'iwi: Seasonal Movements and Distribution of Disease

<https://vimeo.com/channels/966301/139636521>

### Conservation of Hawaiian Forest Birds under Climate Change

<https://vimeo.com/channels/966301/139630724>

### The Vocal Repertoire of the 'Alala - (*Corvus hawaiiensis*) During Breeding Season

<https://vimeo.com/channels/966301/139389461>

### Finding 'Amakihi: Detecting Endangered Bird Species Using Bioacoustics

<https://vimeo.com/channels/966301/139388696>

### Avian Malaria and Mosquito Vectors in the Kahuku Unit of Hawai'i Volcanoes National Park and Ka'u- Forest Reserve

<https://vimeo.com/channels/966301/139388692>

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### Endangered Hawaiian Petrels Moved To Kilauea Point National Wildlife Refuge

*Ten chicks are founders of new colony within state-of-the-art predator-proof enclosure*

Kaua'i, Hawai'i, November 3, 2015

A historic project more than 30 years in the making took place on Kaua'i's north shore on Monday (11/2/2015) when 10 downy, endangered Hawaiian Petrel chicks were flown by helicopter from their montane nesting area to a new colony protected by a predator-proof fence at Kilauea Point National Wildlife Refuge.

The translocation, which involved three separate teams and more than a dozen people, took place simultaneously in Kaua'i's rugged mountain interior and along the coast. In the early morning, two teams were dropped by helicopter onto mountain peaks located in the Hono O Na Pali Natural Area Forest Reserve within the Na Pali-Kona Forest Reserve, state



Photo: Michael McFarlin, Kaua'i Endangered Seabird Recovery Project

lands managed by the Division of Forestry and Wildlife. There the teams headed for 10 nest burrows that had been monitored throughout the breeding season. Each burrow contained a large, healthy chick. The chicks were carefully removed by hand, placed into pet carriers, and hiked up to the tops of peaks where the helicopters picked them up. Like any precious cargo, the chicks' holding boxes were seat-belted into the helicopter to ensure their safety.

Endangered Hawaiian Petrels, or 'Ua'u, are one of two seabird species endemic to the Hawaiian Islands and are found nowhere else on Earth.

Read the full story, courtesy of Hawai'i Department of Land & Natural Resources, <http://governor.hawaii.gov/newsroom/dlnr-joint-news-release-endangered-hawaiian-petrels-moved-to-kilauea-point-national-wildlife-refuge/>

View images at <https://www.flickr.com/photos/usfwspacific/sets/72157658437716644/>



Photo: Lindsay Young  
Pacific Rim Conservation

Lindsay Young, Pacific Rim Conservation



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## Calendar of Events

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116<sup>th</sup> Annual Christmas Bird Count  
December 14<sup>th</sup> 2015 – January 5<sup>th</sup> 2016

James Campbell NWR Tour  
January 16<sup>th</sup> 2016 | 3:00 – 5:00 pm

Kawainui Marsh Waterbird Habitat Restoration  
Saturday, February 6<sup>th</sup> 2016 | 9:00 am – noon



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