

Red-footed Booby

COMMON NAME: Red-footed booby

HAWAIIAN NAME: 'A

SCIENTIFIC NAME: *Sula sula*

LEGAL STATUS: MBTA protected.

APPEARANCE: RFBOs are the smallest of the boobies. Adults have long white pointed wings trimmed in black, a long-pointed tail, a long pale blue to bluish-green bill, and bright red webbed feet for swimming. Juveniles are usually brown, with a paler belly and darker band on the chest. Although several adult color phases exist, from white with black on the wings to entirely brown, most Hawaiian RFBOs are white. It is difficult to differentiate the sexes, except for subtle differences in beak color during mating season; females tend to have a bluer beak. See photo (male on left; female on right).

NATIVE RANGE: RFBOs do not migrate, although they are far-ranging, year-round in the tropical and subtropical regions of the Atlantic, Pacific and Indian Oceans. They are indigenous to Hawai'i. The MCBH colony is only one of two in the MHI and is the largest. The other is located at the USFWS Kilauea National Wildlife Refuge on Kaua'i.



HABITAT: RFBOs feed at sea and nest and perch in colonies on coastal trees and shrubs. On MCBH, they are located in the 25-acre Ulupa'u Head WMA within Ulupa'u crater.

DIET: RFBOs feed on squid and flying fish and plunge dive to capture fish spotted from above but are agile enough to snag flying fish from the air. RFBOs feed by diving vertically into the water and rarely within sight of land. They may dive up to 30 m to pursue prey—flying fish and squid. They feed singly or in mixed species flocks, anytime during the day and after dark. They often hunt in large flocks and are strong flyers and swimmers. They can dive nearly 100 feet to pursue prey and travel up to 90 miles or more in search of food.

REPRODUCTION: Breeding season ranges from late January through September. RFBOs build nest of twigs, grass, and leaves on large open platforms, small trees, and shrubs. Females lay one egg every 15 months. Parents mate for life and share parental duties, taking turns feeding their chick a semi-digested meal of flying fish and squid for about 18 to 20 weeks. During this time, the chick transforms from being born naked, to acquiring a fluffy coat of white down, and finally donning flight feathers for an independent life (see photo inset of parent booby and downy white chick at MCBH).



ECOLOGICAL THREATS: Threats to RFBOs include decreasing food sources due to overfishing, predation on adults and nests, and habitat loss due to coastal development, especially the disappearance of shoreline trees and shrubs. In some Pacific islands, poaching them for food occurs.

USFWS CONSERVATION STRATEGIES: Conservation strategies include: the protection and enhancement of habitat, eradication or control of non-native plant and animal species (especially predators), effective oil spill response, marine debris removal, and mitigation of human disturbance.

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MCBH CONSERVATION MEASURES: RFBOs roost and nest within Ulupa'u Head WMA on MCBH Kaneohe Bay at the northeast end of the impact area within an active weapons RTF. Through diligent conservation measures, both "bullets and boobies" thrive there. The number of birds at the colony has more or less held steady over the last 15 years, at around 1,500 to 2,000+ birds, with up to 500 nesting pairs. The boobies build nests on kiawe and koa haole tree branches each year, primarily during the months of March through mid-September; however, the last few years nesting as early as December has occurred.

Conservation measures at MCBH that benefit the RFBO population include:

- **Habitat protection and enhancement.** MCBH plans to restore and replace deteriorating nesting platforms that were placed in the colony in the early 2000s but have succumbed to age and fallen into disrepair. Thus far, efforts to establish native/Polynesian-introduced trees and shrubs through planting have proven unsuccessful, mainly due to lack of water. Fire-adapted plants, primarily invasive grasses (e.g., buffelgrass, guinea grass) cover the range and are responsible for carrying brush fires. Established BMPs and conservation measures are employed when a project may have an effect on birds.
- **Limiting disturbance.** The birds are not directly in the line of gunfire and have adapted to the sound of gunfire and mortar rounds. Other than the annual Audubon Christmas bird counts, public access to the colony is restricted, arranged in advance, and escorted on a non-interference basis with range training activities.

Colonial nesting birds are highly sensitive to disturbance; destruction of their nests during or near the nesting season could result in a significant level of take. Even visitation to these rookeries by people getting too close and subsequently disrupting nesting activities, can result in take since young birds may be frightened, leave their nests prematurely, become displaced, and die from starvation as their parents return only to the vicinity of the nest site.

It is required that actions within the Ulupa'u Head WMA are restricted during RFBO nesting season. ECPD Natural Resource Managers will review the proposed action and make a determination based on the provided details. If actions during RFBO nesting season are emergency in nature or mission essential, a biological monitor will be required to be on site for the entire duration of the action or as required by ECPD Natural Resource Managers.

- **Predator control.** The principal predatory threat is at-large (feral and domesticated) cats with a minimal concern about mongoose predation. Predator control poses challenges as the colony is located on an active range, so it has to be accomplished around the Range training schedule. Additionally, since the colony is located in an "impact area," explosive ordnance disposal and medical support are required to access most parts of the colony. Due to these limitations, predator control only occurs on an as needed basis or when range closures provide an opportunity to conduct short trap saturation events. Three times a year when the U.S. Department of Agriculture (USDA) Wildlife Services completes two-day water cannon maintenance they bring a truckload of extra traps with them to the location. These traps include mostly DOC 250s as well as live capture traps which are placed around the colony to remove as many mongoose, rats, and cats as possible.
- **Wildlife friendly lighting.** All exterior lights for new construction, replacement of existing fixtures, and renovations shall meet or exceed light requirements developed in consultation with U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA), which incorporate International Dark-Sky Association (IDA) standards and research focused on identifying wildlife-friendly lighting. Natural Resources staff work with base

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planners to incorporate wildlife-friendly lighting standards into all projects, which will address seabird fallout concerns. Appendix E defines the requirements for wildlife-friendly lighting.

- **Fire suppression.** Dry invasive grasses combined with strong trade winds in the crater increases the threat of wildland fire. Invasive grasses are regularly treated with herbicide along range roads. Fuel breaks and firebreaks within the impact area reduce the risk of fire spread. In 2019, additional fuel breaks were created within the booby colony. A water cannon system strategically positioned within Ulupa'u Crater is maintained to aid in suppression of wildfires that pose a risk to roosting and nesting trees. Strict regulations prevent accidental injury or killing of birds from fire and ensure prompt reporting and response to fires should they occur.
- **Education and outreach.** Development and distribution of informational material, including videos, fact sheets, and briefings for military personnel and civilians on base, including outreach with volunteers. An interpretive sign with notice about protection for the RFBOs has also been installed near the bleachers on the range where the Marines are briefed.



REFERENCES

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- DLNR. 2015. *Hawai'i's State Wildlife Action Plan*
- DoD/USFWS. 2014. Memorandum of Understanding Between the U.S. Department of Defense and the U.S. Fish And Wildlife Service To Promote The Conservation Of Migratory Birds.
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- National Geographic. 2011. *Red-footed booby*.
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- Russell, T. and E. VanderWerf. 2010. *Red-Footed Booby Sula Breeding Success at Ulupa'u Crater, Marine Corps Base Hawai'i*. *Marine Ornithology* 38: 129-131.
- USFWS. 2021.
- USFWS. 2021. U.S. Fish & Wildlife Service Bird Nests What you need to know.

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For more information: MCBH Integrated Natural Resources Management Plan. 2022. Sections 6, 7.1, and 7.5,

PHOTOS

1. Mated pair of red-footed boobies. Tim Sutterfield. 2007.
2. Red-footed booby adult with chick. David Pereksta.
3. View from booby colony indicating how firebreaks contain fires. MCBH.
4. Nesting platforms to supplement tree habitat at MCBH red-footed booby colony. Carroll Cox. 2006.