



Hui Manu-o-Kū

In partnership with
Hawaii Audubon Society

Volunteer Training Packet

June 2019

Purpose

This document will serve as training for volunteers to survey manu-o-Kū nests with the Hui Manu-o-Kū. Volunteers are asked to survey a particular geographic area in Honolulu where manu-o-Kū are found. You may choose the area you survey or the Hui Manu-o-Kū may recommend an area. Using the tools and information described below, you will record observations and collect relevant data that will be added to our manu-o-Kū database. We strongly encourage you to become comfortable with using the manu-o-Kū [Database](#) and [Nest Map](#) before you start your surveys as they make the surveying process much easier. In this document, you will find everything you need to know about surveying the Honolulu population of manu-o-Kū. Surveying is a learned skill. It may take you a few times before you feel totally comfortable with this. Do not let this process overwhelm or frustrate you as this is meant to be a fun activity while supporting scientific research. If you have any questions about material in this document, the surveying and data collection protocol, suggested locations to survey or anything else please [contact us](#).

Safety

The most important consideration for us is the safety of our volunteers. Manu-o-Kū are an urban seabird, meaning that you will be surveying in the City of Honolulu. It is important that you stay on sidewalks and other pedestrian areas. Only use crosswalks to cross streets. Do not go into the street to get a better view of a bird. Do not trespass on private property, unless you are granted permission by the property owner. Please be aware of your surroundings, including vehicular and pedestrian traffic. If your safety is threatened, dial 911. If you think a chick or egg is imminently and directly threatened by human activity, call (808) 643-DLNR (3567).

Suggested tools for surveying

- Binoculars – Most important surveying tool. Used to identify species, determine if an egg is present, approximate stage of development, observe behaviors, etc.
- Pen and paper for note taking – Especially useful if you are not using a smartphone to immediately input data.
- Camera for photo documentation
- Smartphone or tablet – Used to access our website, most importantly the Nest Map and Database.
- If not using a smartphone, a computer with internet access is needed to input data later.
- Range finder or app – Used to measure nest height. *CamMeasure Lite* is a free app that is fairly accurate at measuring height.
- Tape measure – Used to measure circumference of tree trunk.

Collecting and inputting data

We developed these protocols so that surveying is an easy and fun experience for our citizen scientists. Citizen scientists will be the main way data on nesting manu-o-Kū will be collected. The amount of time that you survey is entirely your choice. If you want to do multiple surveys per week, that would be great! If you only want to survey once a month, that is fine too. We suggest surveying at least

once per month, but the more data that is collected, the better. Performing surveys every 30-35 days will allow us to track the development of individual chicks and let us accurately compare data with data collected on other islands. The number of nests and area that you survey is also your choice.

When surveying, there are two different scenarios you will face. You will survey a previously recorded nest site to update the previous records we have for that site. The other scenario is discovering a previously unrecorded nest. You can use the manu-o-Kū [Database](#) and [Nest Map](#) to determine if a nest was previously recorded. Start by searching for the location of the nest on the Nest Map. A previously recorded nest will display an icon at the nest site. Click on the icon to learn details about the nest including the Nest ID. Search the Database with this Nest ID and determine if this is in fact the nest you are visiting by viewing the details of the nest record. Once determined if it is a known nest or a newly discovered nest, you can fill out the Nest Observation Form on the [Citizen Science page](#) of the website. If you determine that the nest was not previously recorded by it not being labeled on the Nest Map or not represented in the Database, you may record “NEW” as the Nest ID. If the nest has been previously recorded, please record the Nest ID in your observation. If you could not determine if the nest was previously recorded or could not determine the Nest ID, please write “UNKNOWN”.

Data should only be collected on birds that are perching (birds that are in trees, not flying). Please be as accurate and detailed as possible when filling out the Nest Observation Form, especially for new nests. By submitting the Nest Observation Form, it will be sent to the Hui Manu-o-Kū data manager. The data manager will review the data and input it into the White Tern Database, making it freely available to everyone.

Definitions and examples of terms

- Non-breeding Adult (NBA) – An adult perched in a tree but not associated with an active nest (no egg or chick)
- Courting pair – An NBA pair that is displaying courtship behavior (mate bringing fish to the other, allopreening, roosting next to each other, vocalizing, etc.)
- Breeding pair – A pair that is associated with an active nest (with a chick or egg)
- Nest ID – Each nesting event is given a unique code to identify the nest in the database. Each code has 2 or 4 letters followed by 6 numbers
 - Letters tell you the geographic area of the nest
 - First 2 numbers tell you the tree number within that geographic area
 - Next 2 numbers tell you which nest site within that tree
 - Final 2 numbers tell you which nesting attempt at that nest site in this calendar year
 - Example: FB020101 tells you the nest is in the area of the Federal Building, it's the second tree surveyed in that area, it is the first nest site documented in that tree and this is the first nesting attempt for that pair.
- Fledged – A chick that is able to fly and leave the nest site
- Roosting – A bird that is resting or sleeping

- Copulating – mating



- Incubating – An adult sitting on an egg to keep it warm and protected. The adult is in a hunched position on the branch. Egg may not be visible, but may cause bulge in chest feathers. Adult's legs are not visible when in incubating position.



Although you can't see an egg or the bulge cause by the egg, the position of the bird and the ideal nesting location tells you this bird is incubating an egg.

- Brooding – An adult nestling a chick to keep it warm and protected



- Preening – A bird using its beak to clean and straighten its feathers
- Allopreening – A bird that is preening its mate



- Nest success – A chick has survived through each developmental stage and fledged from the nest
- Nest failure – The egg did not hatch or the chick died before fledging
- Vacant nest – A site previously used for nesting that does not currently host an egg or chick
- Adult turning egg – An adult in nesting position will turn the egg with its body and beak to keep the egg developing correctly



- Adult waiting at nest site with fish – Adult terns catch fish and bring them back to the nest for the chick. You may see an adult waiting at the nest site with fish, but no chick will be at the site. This is because a juvenile chick will explore the neighborhood, then return to the nest for feeding. The adults may wait like this for hours.



- Nest type – Because manu-o-Kū lays its egg directly on the branch, it must find a safe spot that will protect the egg and chick for months. There are various nest types that manu-o-Kū will use:
 - Cup



- Fork



- Straight Branch



- Closed loop



- Tern(s) inspecting observer – Sometimes if there is a newborn chick at a nest, the adults will be protective. If an intruder, such as a citizen scientist making an observation, gets close to the nest, the adult(s) will fly close to you and almost hover right in front of you. It is unknown if they are inspecting you or trying to scare you off, but it is not overly aggressive. While you are not doing the birds much harm, if an adult inspects you, you should quickly make your observation and leave the nest alone.



Identifying White Terns

Manu-o-Kū can sometimes be mistaken for other birds such as pigeons and cattle egrets. It is important that volunteers can differentiate between these three species.

- Manu-o-Kū are entirely white, have large, black eyes, a long, sharply pointed black bill with a blue base, and short, pale blue legs. When sitting on a branch, their tail feathers and wing feathers are pointed. When in flight, they have long, narrow wings and a shallowly notched tail. Manu-o-Kū often fly in groups of 2 to 5 individuals. Their flight pattern is graceful and buoyant. Manu-o-Kū do not land on the ground.



- Pigeons can be entirely white, but can have other colors mixed in. They have smaller eyes, a short pink beak and pink feet. When resting, their tails are more squared off. In flight, their wings are broader and more rounded than manu-o-Kū. Their flight pattern is more direct and they seem heavy in flight with many rapid, stiff flaps. Pigeons can be seen flying, on the ground, or in trees.



- Cattle egrets are mostly white except for yellowish plumes on the head, neck and back during the breeding season. Adults have a yellow bill and long, dark legs. Juveniles may have a darker bill. Cattle egrets are larger than manu-o-Kū with wider wings and much longer neck and legs. They are often seen flying or on the ground, but rarely in trees.



Helpful tips for finding nesting and roosting sites

One way to find a manu-o-Kū nest or roosting site is by locating their droppings. Their entirely white droppings accumulate under trees that they spend much time in. Manu-o-Kū droppings look like white paint splatter. Because they only eat fish and have efficient digestive systems, their feces will be large, pure white splatter with no dark specks caused by seeds, insect parts, shells or anything else.



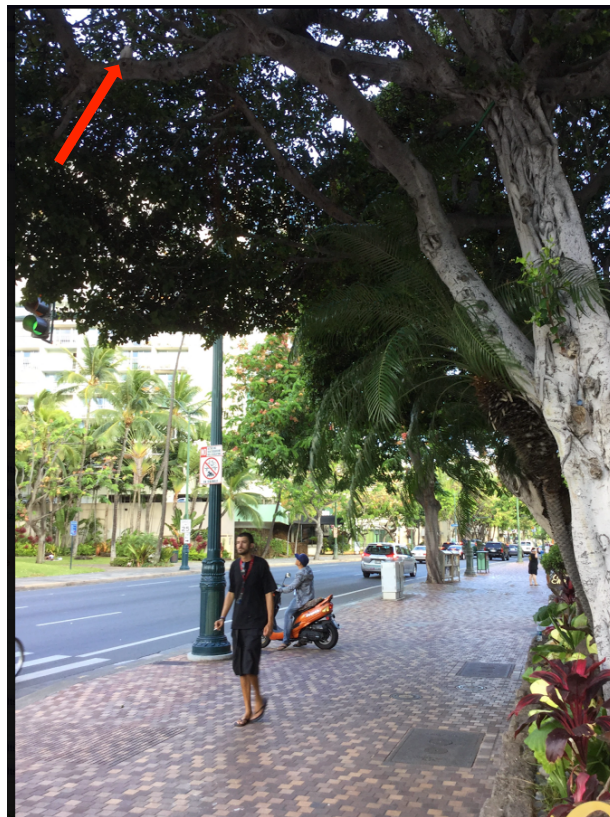
The left picture shows typical manu-o-Kū guano. The right picture is not manu-o-Kū guano. Notice it is not completely white and doesn't look like splatter.



It is very common that the only view you will have of a bird is its tail and wing feathers sticking straight out from the top of the branch.



The picture below shows you a typical view from the street of a nesting manu-o-Kū.



Very often, your first clue that a nest may be close by is the activity of non-breeding adults frequenting the area, socializing and vocalizing. You will often hear their distinctive raspy call before you see them. Their call sounds like *grrich-grrich-grrich* or *eenk-eenk-eenk*. Of course the easiest way to find a previously recorded nest is to search in the [Nest Map](#). This map will show you every single known nest in Honolulu. If you refer to the manu-o-Kū [Database](#), you will be able to find information on specific nests including coordinates, written descriptions and pictures to help you locate the tree and the nest.

Data collection at known nest sites

The following are the categories of data that need to be collected for nests that have previously been documented. Don't feel pressured to fill in all categories, but the more data we have, the more we can understand about the birds. If you are unsure of a data field, please say "unknown".

- Observer name and contact info
- Date and time of observation
- Description of tree and nest location
 - Please be as thorough as possible in describing location. Accurate coordinates are the most useful way to describe tree location. Also include landmarks, address, building names, street names/intersection, directions (east, makai, Ewa-side, etc.) or any other information that would allow the nest to be easily relocated. Also describe the nest's specific location in the tree.
- Nest ID
- Nest Status
 - NBA(s) present in tree
 - Egg
 - Chick
- Stage of chick development
 - Small chick
 - Medium chick
 - Large chick
 - Juvenile
- Number of NBAs present in tree
- Behavior
 - Adult waiting at nest site with fish
 - Adult feeding chick
 - Adult preening chick
 - Adult preening itself
 - Chick preening itself
 - Adults allopreening
 - Tern(s) fended off intruder avian species
 - Tern(s) inspected observer
 - Adult brooding chick
 - Adult turning egg
 - Adult(s) vocalizing
 - Chick begging
 - Adult incubating
 - Chick flying
 - Adults copulating
 - Dropped fish at nest site
 - Other (describe in detail in notes)

- Notes
 - Please give us detailed notes of what you observed. Include any additional notes that may be of importance: local hazards to observers, nearby mammals or birds, egg shell remains found beneath nest, etc.
- Band
 - If you're lucky enough, you may find an adult with a small silver band on its leg. Note that the bird has a band and if possible, though we know it is very difficult, try to read or photograph the number on the band so we can identify the bird.
- Pictures
 - If possible, you may provide pictures of the tree, bird(s) or anything else that may be useful in learning more about the nest.

Additional information needed if documenting a new site not already in the database

- Nest ID
 - Please write "NEW" for new nest sites. The data manager will assign the official nest ID using the system described above.
- Description of tree and nest location
 - Remember to write a thorough description of the location. This is especially important for newly discovered nests.
- Tree species
 - Please refer to guide below to identify common tree species.
- Nest height
 - If possible use range finder or smartphone app, if not give your best estimate. If height is estimated, please write "est". Height should be taken in feet and inches.
- Branch diameter
 - Estimate the diameter of the branch on which the nest is located. Give diameter in inches.
- Tree circumference
 - Use tape measure to measure circumference of trunk at breast height (approximately 4.5 feet above ground). Report circumference in feet and inches.
- Nest type
 - Cup
 - Fork
 - Straight Branch
 - Closed loop
 - Other or unknown
- Pictures
 - Pictures can be used to document behaviors and other observations. They also make revisiting the tree much easier. If possible, please provide a picture of the tree with any useful nearby landmarks. Also please provide a picture showing the location of the nest site within the tree.

Differentiating between stages of development

- Egg – Gray with brownish streaks and spots. Cryptic appearance.



- Small chick – Very fluffy (these feathers are called down feathers). Can be white, gray, tan or mixed colors. Short, stubby, completely black bill.



- Medium chick – Partly downy and partly feathered. Mostly white or gray, may have gray, brown or tan streaks. Short, stubby, completely black bill.



- Large chick – Minimal down feathers. Mostly white with tan or brown streaks. Their completely black bill is shorter than in adults.



- Juvenile – No down feathers. White with light brown streaking on wings. Completely black bill, shorter than in adults. Eye ring not completely developed. Have the ability to fly, but often only for short distances.



- Adult - Completely white, no brown streaking on wings. Long, pointed black bill with blue base. Completely developed black eye ring.



**WHITE TERN (MANU O KŪ)
GROWTH CHART**

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Newly Hatched



1 Week



2 Weeks



3 weeks



4 Weeks



5 Weeks



6 Weeks



7 Weeks



8 Weeks



Identifying tree species

Manu-o-Kū will nest in just about any large tree that has an optimal nest site. The following are the most common trees that manu-o-Kū nests are found but this is not a complete list.

- Kukui (*Aleurites moluccana*)



- Monkeypod (*Samanea saman*)



- Shower tree (*Cassia sp.*)



- Banyan (*Ficus sp.*)



- Mahogany (*Swietenia sp.*)



- Kiawe (*Prosopis pallida*)



- Umbrella Tree
(*Schefflera actinophylla*)

