

= L?na 'i hookbill =

The L?na?i hookbill ( *Dysmorodrepanis munroi* ) is an extinct species of Hawaiian honeycreeper . It was endemic to the island of L?na?i in Hawai'i , and was last seen in the southwestern part of the island . George C. Munro collected the only known specimen of this species in 1913 , which is housed in the Bernice P. Bishop Museum in Honolulu , and saw the species only twice more , once in 1916 and for a final time in 1918 . No other sightings have been reported . They inhabited montane dry forests dominated by ?akoko ( *Euphorbia* species ) and ?puhe ( *Urera glabra* ) . The L?na?i hookbill was monotypic within the genus *Dysmorodrepanis* and had no known subspecies . Its closest relative is believed to be the ???? , and some early authors suggested that the L?na?i hookbill was merely a deformed ???? . The L?na?i hookbill was a plump , medium @-@ sized bird with greenish olive upperparts and pale whitish yellow underparts . It also had a yellow or white superciliary line and a white chin and throat . The wings also had a distinctive and conspicuous white wing patch . The hookbill 's distinguishing characteristic was its heavy , parrotlike bill , which had the mandibles hooking sharply towards each other , leaving a gap between them when the beak was closed .

As the bird became extinct before significant field observations could be made , not much is known about its behavior . The L?na?i hookbill is only known to have eaten the fruit of the ?puhe ; however , it is unlikely that its unique bill would have developed to eat fruit , and it may have been a snail specialist . The hookbill has not been seen since 1918 , and by 1940 nearly all of L?na?i 's forests were converted into pineapple fields , destroying the bird ' s habitat . The combination of habitat destruction and the introduction of feral cats and rats are thought to have led to the L?na?i hookbill ' s extinction .

= = Taxonomy = =

The L?na?i hookbill was first collected by George C. Munro from L?na?i 's Kaiholena Valley on February 22 , 1913 . In 1919 Robert Cyril Layton Perkins described the species as *Dysmorodrepanis munroi* based upon this specimen , placing the hookbill in a new , monotypic genus . The genus name is derived from the Ancient Greek words *dusmoros* " ill @-@ fated , " and *drepanis* to identify the species as a Hawaiian honeycreeper . *Drepanis* comes from the Ancient Greek word *drepane* " sickle , " in reference to most Hawaiian honeycreeper 's bills . The specific name *munroi* recognizes the collector of the specimen , George C. Munro . The common name came from the species ' limited range and distinctive bill shape .

However , other taxonomists challenged the validity of the species as early as 1939 , noting that the L?na?i hookbill was only known from one specimen and arguing that it was merely an aberrant and partially albino female ???? . The hookbill 's validity was not confirmed until 1989 when the specimen 's skull was removed and examined . The bird 's cranial osteology , myology , plumage , and bill morphology confirmed the distinctness of the species .

The hookbill was a member of the Hawaiian honeycreeper subfamily Drepanididae and the tribe Psittirostrini , which it shared with seven historically recorded species and about ten species known only from fossils . It is believed that the L?na?i hookbill was most closely related to the ???? . No fossil specimens of the L?na?i hookbill have been found .

= = Description = =

The L?na?i hookbill was a plump , medium @-@ sized bird . It had greenish olive upperparts and pale whitish yellow underparts , as well as a yellow or white superciliary line . The chin and throat were white . The wings ' secondaries had a distinctive and conspicuous white wing patch . Due to the subdued colors of the sole specimen , it is believed that it was a female , suggesting that the male would have had a brighter plumage , especially in the superciliary line . The eyes , which were large for a bird of the hookbill 's size , were dark brown and the muscular legs were gray with yellow toepads . The bird was about 6 inches ( 15 cm ) in length , and the weight is unknown .

The hookbill 's distinguishing characteristic was a heavy , parrotlike bill . The upper mandible hooked sharply downwards , while the heavy lower mandible hooked sharply upwards towards the middle of the upper mandible . This structure left a gap between the two mandibles when the bird held its beak closed . It is believed that the bill was pale pink in coloration . The jaw muscles were particularly well developed around the bill . The hookbill 's tongue was primitive and nontubular .

Like other Hawaiian honeycreepers , the hookbill possessed a distinctive musty odor . The bird 's only known vocalization was an inconspicuous chirp ; however , all other Hawaiian honeycreepers are excellent vocalists that demonstrate an array of sounds , and therefore the hookbill likely had a broader , unrecorded repertoire .

#### = = Distribution and habitat = =

The L?na?i hookbill was endemic to the island of L?na?i in Hawaii . All recorded sightings of the species were made from the southwestern end of L?na?i 's forests , which included the Kaiholena Valley and Waiakeakua . These sightings were between 2 @,@ 000 and 2 @,@ 600 feet ( 610 and 790 m ) in elevation . However , the species ' habitat once covered thousands of acres on L?na?i , and it is possible that the species once had a broader range on the island . The species was non @-@ migratory .

It is believed that the L?na?i hookbill inhabited montane dry forests on L?na?i dominated by ?akoko ( Euphorbia species ) and ?puhe ( Urera glabra ) . The unique shape of the hookbill 's bill , particularly when compared with the ???? 's bill , and its apparent rarity suggested that the species was an extreme specialist and was therefore restricted to this habitat .

#### = = Ecology and behavior = =

The L?na?i hookbill is only known to have eaten the fruit of the ?puhe . The type specimen was caught while feeding on the plant , and its berries were subsequently discovered in its stomach . It is considered likely that the hookbill additionally ate ?akoko fruits due to their similarity in size and shape to those of the ?puhe . However , the hookbill 's unique bill is considered unlikely to have evolved if the species was purely frugivorous , and it has been suggested that the hookbill specialized in eating snails . The species was very active while searching for food , constantly flying from tree to tree . While perched it shifted restlessly .

Based upon the structure of the bill , it has been suggested that this unique bill was used as a pincer , with the tips of both mandibles touching . The hookbill could have used this movement to pluck fruits or flowers for consumption , or it may have been used to extract snails from their shells . It is also possible that the bird could have crushed a snail shell between its mandibles and then used its tongue to ingest the meat and expel the shell out of the open sides of the beak .

There is no recorded information on the L?na?i hookbill 's breeding behavior . However , the other Hawaiian honeycreepers are remarkably uniform in their breeding behavior , and it is therefore likely that the hookbills also bred from early winter through the end of summer in August , with pair bonding being completed by January or February . The males likely defended a territory that moved along with his bonded female and became a centered around the nest after the female constructed it . It is hypothesized that the hookbill laid two to three eggs and that its young were altricial .

#### = = Extinction = =

Historically , the hookbill was only recorded three times . All three sightings were made by George C. Munro ; the first was when he collected a single bird on February 22 , 1913 , and the other two sightings came on March 16 , 1916 and August 12 , 1918 . The only existing specimen is in the Bernice P. Bishop Museum in Honolulu . The species was not recorded by the native Hawaiians .

The fact that Munro , an excellent observer who spent years on L?na?i , only saw the bird three times implies that it was already very rare by the 1910s . From 1900 to 1940 nearly all of L?na?i 's forests were converted into pineapple fields . This conversion reduced the area of the hookbill 's

potential habitat , and is believed to be the biggest contributor to the species ' extinction . It has also been suggested that avian malaria , which began affecting L?na?i 's birds in the 1920s , may have contributed to the species ' decline . Likewise , the introduction of feral cats and rats to L?na?i may have led to a decline in the hookbill 's population . The extinction of local snails through human intervention could also have led to the L?na?i hookbill 's extinction .