

Discovery / Disappearance

How exciting it is to realize
we can still discover new species,
but how heartbreaking
to know with terrible certainty
that some birds
will never again appear
in a birder's
binoculars.



Bird the World's Islands Now



The Guam subspecies (or possibly full species) of Micronesian Kingfisher can now be seen only in zoos, though in the mid-1970s it was common in the wild.

by H. Douglas Pratt

Island birds hold a special fascination for scientists and amateur naturalists alike. Island avifaunas are rich in endemics (i.e., species confined to a single island or group), and remote oceanic isles are superb natural laboratories of evolution. Nearly every island of any size has at least one endemic, and very remote island groups may have an almost entirely endemic land avifauna. Island birds, furthermore, often represent the most unusual and rarest members of their families. The Pink Pigeon, Black Parrot, Flightless Cormorant, Tooth-billed Pigeon, Tumbler, and Giant White-eye are all island endemics. The international birder sooner or later will have to visit the islands even to see representatives of all the major bird groups. Todies, Palmchat, Kagu, Hawaiian honeycreepers, kiwis, and New Zealand wrens are all examples of taxonomic groups found only on islands. World birders, nevertheless, often neglect islands because they can see more birds on a visit to Peru, Kenya, India, or another continental area. For the

birding visitor, islands offer quality rather than quantity.

Some remote islands are volcanic in origin and, therefore, much younger than the large continents. Their birds evolved from continental ancestors that reached the islands in sufficient numbers to colonize. Because few birds are able to reach islands over vast expanses of ocean, colonization events are infrequent. This situation allows ample time for successful colonizers to evolve into new species as they adapt to an island environment.

In this way, Norfolk Island, east of Australia, gained three species of white-eye, all derived by successive colonizations by the same ancestral species on the mainland. The two older species are now island endemics. On remote oceanic archipelagoes, such as the Galapagos and Hawaiian islands, an evolutionary phenomenon known as adaptive radiation has often occurred. Because an island group provides many opportunities for a species to fragment into geographically isolated (allopatric) populations,

speciation (the formation of two species from one) is frequent. As the number of species multiplies, each new one occupies a slightly different place (ecological niche) in the avian community. Over millions of years, an array of highly divergent species may evolve in an island chain from a single continental ancestor.

The most spectacular examples of this phenomenon are the Hawaiian honeycreepers and the Galapagos finches. The extent to which the species diverge is a function primarily of time, but it also depends on the degree of isolation of the archipelago. Because the Hawaiian Islands are much older and more isolated than the Galapagos, the honeycreepers, whose ancestor was a finch, probably one like a siskin or redpoll, have "adaptively radiated" to fill a much greater variety of avian niches. Whereas the Galapagos birds are still mostly finch-like, with a couple of thin-billed derivatives (the Warbler Finch and Cocos Finch), the honeycreepers include everything from soup to nuts! Some finch-like species remain (Laysan Finch, Palila), but the Ou is a tanager-like fruit-eater, the Akikiki (Kauai Creeper) resembles a nuthatch, the Maui Creeper is a warbler-like leaf-gleaner, the Nukupuu is a curve-billed bark-picker, the Apapane is a short-billed nectar-feeder, and the Iiwi sips nectar through a down-curved sickle bill.

Some island adaptations are bizarre. Neither Hawaii nor the Ga-

A few Hawaiian rarities, such as Maui's Akokekohe (Crested Honeycreeper) can still be seen by the diligent birder.

lapagos have been colonized by woodpeckers, and, in each case, that open niche has been filled by a bird decidedly not like a woodpecker. The Woodpecker Finch of the Galapagos gets the job done by using cactus spines as tools to dig larvae out of crevices. In Hawaii, the Akiapolaau has a built-in spine (a long down-curved upper mandible) and opens cracks by pecking with its stout, straight lower bill.

There are other islands with a different geological history. They may represent ancient fragments of continental land that served as refuges where birds that disappeared for one reason or another on the continents survived as relics on the islands. Whole bird families, such as the West Indian todies, have survived in this way, as have several other families on Madagascar and New Zealand.

Although the evolutionary story on islands is exciting, the history of island birds and their interaction with mankind is a sad tale of ongoing devastation. The very adaptations that were necessary or desirable for birds on remote, predator-free islands made these insular species extremely vulnerable to outside disturbances. Most island colonizers left their predators and diseases behind on the continents. Flight, with its inherent risks and high-energy requirements, can be seen as a liability in the island context, with the result that many island birds became flightless. Such birds obviously had little chance

for survival when confronted for the first time by rats, cats, and mongooses. Similarly, without disease as a constant selective force, island populations lose their disease-fighting adaptations.

In Hawaii, mosquitoes were absent until the early nineteenth century. After these insects arrived in the water stores of whaling ships, the native birds became vulnerable to such mosquito-borne infections as avian pox and malaria, with disastrous results. Other problems faced by island birds stem from the fact that islands are always smaller than a colonizer's original home. Island birds must adjust their reproductive rates so as not to overburden limited island resources. But the reduced fecundity that was an advantage in a benign environment becomes a severe liability in the face of new stresses.

Over 90 percent of the birds that have become extinct since the 1600s have been island endemics. The flightless ones, such as the Dodo of Mauritius and numerous island rails, were among the first in historic times to go. We now know that the destruction started much earlier. The ancient Polynesians, with their commensal rats, dogs, and pigs, wiped out the New Zealand moas and destroyed at least half of the native Hawaiian avifauna, including flightless rails, ibises, and geese.

What does all this mean for the world birder? Are the islands so



devastated that they are not worth bothering with? Obviously, no one will ever add a moa to his or her life list, and nothing is as dead as a Dodo. On the other hand, a good variety of Hawaiian honeycreepers can still be seen in the mountain forests. Many New Zealand endemics can still be observed on offshore island refuges, and even some extremely rare birds, such as the Seychelles Magpie Robin, are still observable. Nevertheless, all island birds are vulnerable; even those not presently listed as endangered can disappear with alarming swiftness. Nearly 60 percent of the birds included in the International Council for Bird Preservation *Red Data Book* are island endemics. Today's endangered species is tomorrow's extinct species.

If you want to see island endemics, the time to start is now. In the fifteen years that I have specialized in island birds, two species I have seen have become ex-



The Hawaiian Goose, or Nene, is the only endemic goose to survive the Polynesian colonization, primarily because it had not, like the others, lost the power of flight.

tinct (Guam Flycatcher and Kauai Oo); one survives only in captivity (Guam Rail); and several others are almost certain to vanish soon (Hawaiian Crow, Ou, Kamao). Some species that had survived for a long time at low numbers crashed with bewildering suddenness.

Kauai retained all of its historically known birds into the 1960s. The first to be lost was the Kauai Akihoa, last seen in 1969. The other rare denizens of the fabled Alakai Swamp seemed to be holding their own into the 1970s. As I write, however, the Kauai Oo has been declared "probably extinct." The last known individual apparently perished some time after mid-1988. A few individuals each of the two Kauai solitaires, the Kamao and Puaiohi, cling to a precarious existence in the uppermost reaches of the Alakai Plateau, which they share with the last few remaining Ou on the island. Even more common spe-

cies such as the Akikiki (Kauai Creeper) are becoming harder and harder to find and are apparently withdrawing into the highest reaches of the mountain forests. The birder, who would have had a reasonable chance of seeing all of these birds in 1975, must now, only fifteen years later, settle for seeing only the creeper and dreaming of what might have been.

The sudden deterioration of the avifauna of Kauai was unforeseen and is still a mystery, although avian disease is a likely culprit—the alien mosquitoes are adapting to ever-higher elevations and feral pigs are penetrating farther into the forests and digging mud holes in which the insects can breed. Although the speed of the decline is surprising, all of these species have been long recognized as endangered. A much more chilling example of what can happen on an island is provided by recent events on Guam.

Guam, southernmost of the Marianas and the largest island in Micronesia, had an avifauna that included: two endemic species (Guam Rail, Guam Flycatcher); four endemic subspecies (Rufous Fantail, Micronesian Kingfisher, Nightingale Reed-Warbler, and Bridled White-eye); five Mariana Islands endemics (Mariana Fruit-Dove, Mariana Crow, and subspecies of Micronesian Starling, Micronesian Honeyeater, and Island Swiftlet); and the White-throated Ground-Dove, found outside the Marianas only on Yap. All of these species except the reed-warbler were thriving throughout the island as recently as 1968. By the early 1970s, birds had begun to disappear from seemingly unchanged habitats in southern Guam. When I first visited the island in 1976, the southern two-thirds, where some of the best forest was found, was an avian desert. The only passerine I could find on that part of the island was a lone Micronesian Starling. In contrast, everything appeared normal in the northern third of the island; native forest birds were common to abundant, depending on the species.

By 1978, on my second visit, the birds had contracted even farther toward the north. Numerous localities had gone from having abundant birds to no birds in just two years. The demarcation line between birds and no birds advanced northward in ensuing years with increasing speed. By the time the federal bureaucracy

could place the Guam Flycatcher on the endangered species list, the bird was already extinct. A bird still common in 1976 was extinct by 1983.

At this writing, Guam is a silent place, except for the noise generated by human beings. The kingfisher and the rail survive in captivity in U.S. mainland zoos, and a few Island Swiftlets, Micronesian Starlings, and Guam Crows survive on the island, but all the other native birds are gone. Even the once-abundant introduced birds, such as Black Drongo, Philippine Turtle-Dove, and Chestnut Mannikin, are reduced to pitiful remnant populations.

The cause(s) of what may be the greatest avian catastrophe of the twentieth century may never be known completely, but at least the terminal phase of the bird declines can be blamed on predation by the Brown Tree Snake (*Boiga irregularis*), introduced to Guam from the Solomon Islands after World War II, supposedly to control rodents. Why the snake lived on Guam for twenty years before doing any noticeable damage to bird populations is unanswerable, but there is now little doubt that the spread of the snake coincided closely with the advancing front of bird disappearance.

Once birds had become scarce, the snakes fed on skinks and geckos, small monitor lizards, house shrews, rats, and mice. They are thus finally doing their

job, but in the process they have made Guam a dead island. Because the Brown Tree Snake has the habit of hiding by day in nooks and crannies, such as those found in shipping containers, and because Guam is a major military and commercial shipping point in the Pacific, the eventual spread of this dangerous snake to other islands may be inevitable. Several have already turned up around Pearl Harbor in Hawaii.

The lesson for the birder is obvious: even island avifaunas that seem healthy and unthreatened can be devastated in the twinkling of an eye by totally unexpected and even unprecedented factors. Nor is the Guam example unique; it is but the latest in a long history of sudden disruptions of island avifaunas.

In 1918, a shipwreck on Lord Howe Island, east of Australia, brought rats to the island for the first time. Within two years, five species of birds had succumbed to the rat plague. When rats gained access to Eastern Island, Midway, during World War II, they made quick work of the Laysan Finches and Laysan Rails that had been introduced there in an effort to save them when Laysan Island had been eaten down to the bare sand by introduced European rabbits. The finch survived on Laysan by feeding on seabird eggs, and the island's vegetation has now recovered, but the rail is extinct, as are the Laysan forms of Apapane and Millerbird. One shipwreck

on that unfortunate island could mean a swift end for the Laysan Finch and the island's other surviving endemic, the Laysan Duck.

The main Hawaiian islands were the scene of a mysterious crash of bird populations in the 1890s. Whole species that were common in the late 1880s had died out by the turn of the century. Some believe rats were also involved in that catastrophe, although avian disease seems more likely. Lanai, which was essentially uninhabited at the time, escaped the crashes of the 1890s but suffered them later. Lanai's birds had been mostly thriving and even possibly increasing prior to 1923, when Lanai City was built and humans moved to the island with their rats and disease-carrying domestic fowl. By 1930, it was all over. The endemic Lanai Hookbill (recently recognized as a valid species from a single specimen collected in 1916) and populations of Akialoa, Ou, Maui Creeper, Olomao, and Iiwi all were swept away.

Obviously, island birds are likely to experience more of the same calamities in the future, even if the best of conservation efforts are made on their behalf. The world-traveling birder, therefore, would be well advised to include as many islands as possible in his or her itinerary. One never knows where the next disaster will strike, but some priorities can be set. Smaller islands are inherently more vulnerable to dis-



The Kauai Oo, photographed in 1975, is the most recently extinct U.S. bird.

turbance than larger ones, and are much more likely to suffer sudden catastrophes. Thus, for example, the birder might want to concentrate on the smaller West Indian islands that harbor endemics (Montserrat, Dominica, St. Lucia, St. Vincent, etc.) before tackling Cuba, Hispaniola, or Jamaica. Of course, when a species is at a critical population level but can still be seen without disturbance, as is the case with the Puerto Rican Parrot, a special effort just to see it is justified.

Perhaps the highest island priority for the birder should be Hawaii. More endangered species of birds are found there than in any other archipelago, and many of them are unlikely to survive the twentieth century. Of course, such critically rare birds as Nukupuu, Olomao, and Poo-uli may already be too far gone to justify the great amount of effort necessary for just a chance of seeing them. Birding in Hawaiian rainforests is physically and logistically challenging. On Kauai and Maui, where most of the ultra-rare species survive, the best areas are remote and legally protected (overnight stays are not permitted) so that spending sufficient time in them to see the birds is a problem. Interested birders with the required skills might consider volunteering for one of the periodic surveys conducted by the state of Hawaii to monitor rare-bird populations. They should be prepared to spend sev-

eral weeks and do some really hard work.

Other areas that are normally closed to the public, such as the Waikamoi Preserve on Maui and Hakalau Forest National Wildlife Refuge on Hawaii, can be visited by any birder who joins an organized group that can make the necessary advance arrangements.

Second only to Hawaii in the number of endangered birds are the Seychelles, another area most easily visited on an organized tour. In contrast to Hawaii, most of the Seychelles endemics, though dangerously low in numbers, are not so logistically difficult to see. Mauritius, another Indian Ocean island, also has several critically endangered birds that can nevertheless still be observed. For Americans, the West Indies provide relatively easy places to build an island-endemic life list. In my opinion, all of these islands should have a higher priority for the birder than the much-visited Galapagos, which have a much higher degree of legal protection, fewer endangered species, and fewer obvious threats. Galapagos birds will probably still be there in the next century, but many Hawaiian and West Indian birds may not.

Although there are many exceptions, islands worldwide have in common many characteristics important to the birder. Island endemics tend to be forest birds, and forests tend to survive mainly in the higher interior

parts of an island. Thus a quick visit to a village along the shore is not likely to be of much use to the birder, although that is what you usually get on a cruise. You will need your own transportation (i.e., a rental car) and sufficient time to seek out the best habitats. Be prepared to do some climbing. Examples of high-elevation island "refuges" include the upper forests of Rarotonga in the Cook Islands (Rarotonga Monarch, Rarotonga Starling); Tol Island in the Truk Lagoon (Great Truk White-eye); Savaii, Western Samoa (Samoa White-eye); and Mahe, Seychelles (Seychelles Scops Owl, Seychelles White-eye). Visits to these areas may be difficult, and you may gain only a few lifers for your efforts, but you will then possess some of the crown jewels of birding.

A final word of advice regards taxonomy. Many island endemics in the past were lumped into large, geographically variable species. Quite a few of these forms were rather strongly differentiated from other subspecies, and many are now being recognized once again as full species. Advances in systematics, including biochemical techniques, now provide a much better understanding of the distinctiveness of island forms. (It seems that biochemistry has, more often than not, shown that birds that look different *are* different.) So don't overlook a distinctive island subspecies just because the field



Single-island endemics, such as the Golden White-eye of Saipan, should always be considered vulnerable even when common on the island.

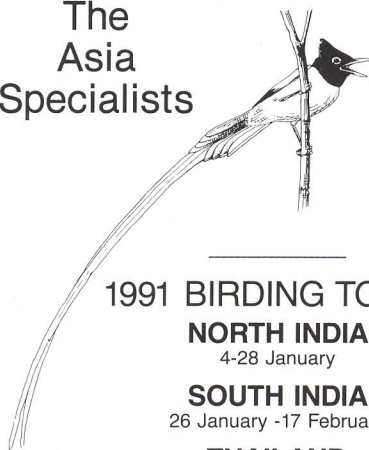
guide does not call it a species. Recent studies have revealed, for example, that the Santa Cruz Island Scrub Jay found off the coast of southern California is probably a good species, and both the Kauai Amakihi and Kauai Akepa (Akikiki) have already been recommended for separation as species. The birder in Hawaii thus would be wise to try to see the Elepaio on all three of the islands on which it occurs, even though at present it counts as only one species. You can keep the other two in escrow.

The rapid pace at which threats to island birds are known to develop and the likelihood of unforeseen disasters for island birds make seeing the island endemics a critical birding priority. The world's island avifaunas are like a "thousand points of light" winking out one by one. See them now, ere another island falls silent.

H. Douglas Pratt is an ornithologist and bird artist who specializes in birds of the tropical Pacific region. His doctoral dissertation was on systematics of Hawaiian native birds. Doug leads birding tours to Hawaii and other Pacific islands and is a free-lance illustrator of bird books, such as the National Geographic's Field Guide to the Birds of North America, Birds of Hawaii and the Tropical Pacific, and Birds of Colonial Williamsburg. His address is Museum of Natural Science, Louisiana State University, Baton Rouge, Louisiana 70803. All photographs and the painting are by the author.

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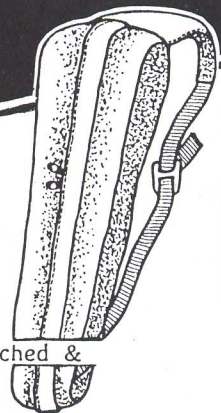
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